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1 **The importance of the ‘family clock’: Women’s lived experience of fertility decision-**  
2 **making 6 years after attending the Fertility Assessment and Counselling clinic**

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45  
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47

48 **Abstract**

49

50 This study explored women's lived experience of making fertility decisions six years after attending the  
51 Fertility Assessment and Counselling (FAC) clinic in Copenhagen, Denmark, which is a personalized  
52 fertility awareness intervention. We conducted a qualitative interview study with 24 women who attended  
53 the FAC clinic 6 years earlier. Interviews were semi-structured and broadly examined the women's  
54 perceptions and experience of the intervention during follow-up. Data was analyzed using a  
55 phenomenological framework and themes were identified related to women's experience of making fertility  
56 decisions after attending the FAC clinic. The overarching theme regarding the women's lived experience of  
57 making fertility decisions after attending the FAC clinic was: **Fertility decisions are guided by the 'family  
58 clock'**. There were four themes: *1) Deciding to 'get started' by attending the FAC clinic; 2) Sense of making  
59 informed and empowered decisions; 3) Influence of partner status on fertility decisions; and 4) Decisions  
60 dictated by circumstance over preference or knowledge.*

61

62 At follow-up, the majority (21 women, 88%) had become parents. More than half of the women said that  
63 they had not achieved their desired family size. Consideration of women's 'family clock' is necessary in  
64 personalized fertility awareness interventions to enable women to achieve their family goals.

65

66 Keywords: fertility, education, fertility awareness, qualitative

67

## Introduction

68  
69 Women's age at first birth has been steadily rising in high income countries as an increasing number of  
70 women delay childbearing (Schmidt et al., 2012). Fertility awareness initiatives and educational  
71 interventions have been developed in response to the recognized negative consequences of delayed  
72 childbearing (e.g., age related infertility, smaller family sizes than intended, unintentional childlessness;  
73 Schmidt et al., 2012) and strong evidence for the presence of significant gaps in men and women's fertility  
74 knowledge (Pedro et al., 2018). The underlying assumption in developing fertility education interventions is  
75 that men and women may be making decisions about their fertility based on inaccurate information or  
76 insufficient knowledge. Fertility education interventions were developed with the goal of promoting  
77 informed and satisfying fertility decisions and to assist men and women to achieve their family building  
78 goals. But what does it mean to make informed and satisfying fertility decisions and are men and women  
79 meeting their family building goals after being exposed to fertility awareness interventions? Two broad  
80 categories of fertility awareness interventions exist. The first are broad fertility educational strategies that are  
81 meant to reach a wider audience to increase general knowledge about fertility (e.g., fertility campaigns,  
82 educational websites; e.g., Boivin et al., 2018b; Hammarberg et al., 2017; Daniluk & Koert, 2015). The  
83 second are personalized fertility assessments that provide tailored guidance and information unique to the  
84 individual based on assessment of risk factors and/or medical examination to increase (e.g., Bunting &  
85 Boivin, 2010; Stern et al., 2013; Hvidman et al., 2015).

86 One such personalized fertility awareness intervention is The Fertility Assessment and Counselling (FAC)  
87 clinic, which was opened in late 2011 in Copenhagen, Denmark in Rigshospitalet, University of Copenhagen  
88 Hospital. It provides personalized fertility assessment and guidance to individual women and men in relation  
89 to their personal fertility levels (Hvidman et al., 2015). Individuals are self-referred and consultations are  
90 provided free of charge by a consultant in reproductive medicine. They undergo a clinical examination (e.g.,  
91 for women – antral follicle count (AFC), anti müllerian hormone (AMH) test; for men – semen analysis) and  
92 an evaluation of individual risk factors for infertility (e.g., personal medical and reproductive history and  
93 lifestyle factors) and are given advice tailored to their personal risk profile. The overall goal of the FAC  
94 clinic is to increase women and men's fertility awareness and to assist them to achieve their family building  
95 goals (Hvidman et al., 2015).

96 Several studies testing the FAC clinic concept have been published (e.g., Birch Petersen et al., 2015;  
97 Hvidman et al., 2015). For example, in a two-year follow-up study, Birch Petersen and colleagues (2017)  
98 found that 68% of the 570 women who answered the survey (91% response rate) had started to try to become  
99 pregnant since attending the FAC clinic. However, we know less about women's lived experience of making  
100 decisions related to their fertility after attending the FAC clinic. In assessing the feasibility and acceptability  
101 of a health education intervention, it is important to gather qualitative data regarding the participants'

102 experiences with an intervention to assess its impact (Bowen et al., 2009). Qualitative data allows for an in-  
103 depth examination of a phenomenon in order to gain a better understanding of the unique nuances (Patton,  
104 2014).

105 Besides the current study, only one other qualitative follow-up study has been conducted on women who  
106 attended the FAC clinic. Sylvest and colleagues (2018) gathered data from interviews with 20 women who  
107 attended the FAC clinic one year prior to the interview. This study examined the impact of attending the  
108 FAC clinic on women's decisions and subsequent choices regarding their fertility. Women believed that  
109 attending the FAC clinic was a 'catalyst for change' in their lives (i.e., created or facilitated change). Some  
110 women said they remained in 'limbo' and were still in doubt about timing of pregnancy because they did not  
111 receive a clear deadline of how long they could continue to delay childbearing from the FAC clinic.  
112 However, others stated that attending the FAC clinic gave them peace of mind that they could wait to  
113 become pregnant and figure out their future plans about childbearing. Given that the follow-up interviews  
114 were conducted only one year after attending the FAC clinic, we do not know about their lived experience of  
115 fertility decision-making in subsequent years.

116 The study of fertility decision-making has been undertaken in several different fields (e.g., demography,  
117 economics, reproductive health, maternal and child health, psychology). One of the ways in which fertility  
118 decision-making has been studied is through an examination of individuals' fertility intentions and behavior  
119 and the factors that influence them. The Theory of Planned Behaviour posits that there are social and  
120 psychological processes that influence the creation of individual attitudes and behaviour influencing  
121 decisions (Ajzen, 2002; Ajzen & Klobas, 2013). Miller and Pasta (1995) adapted the original Theory of  
122 Planned Behavior (TPB) to fertility-related decisions. They included intentions regarding child-desire  
123 (whether to have children), child-timing (when to have a child), and child number (how many children wish  
124 to have). In this model, fertility intentions (motivations to perform behaviour) are determined by personal  
125 attitudes (assessment of positive or negative outcomes of behaviour), subjective norms (social influence to  
126 perform/not perform the behaviour), and perceived control (the degree to which a person believes they can  
127 act) (Ajzen, 2002). Researchers such as Williamson and Lawson (2015) have found support for the TPB as a  
128 suitable conceptual framework for explaining the processes involved in people's fertility intentions regarding  
129 delayed childbearing.

130 Studies have examined the broad processes involved and factors related to readiness for parenthood and  
131 fertility decision-making (Boivin et al., 2018a; Lampic et al., 2006; Petersen et al., 2012). For example,  
132 Boivin and colleagues (2018a) examined fertility decision-making in 10,045 men and women currently  
133 trying to conceive. Factor analysis identified four important decisional factors in readiness to conceive:  
134 social status of parents, financial conditions, personal and relational readiness and physical health and child

135 costs. Cross-sectional research demonstrates that men play an important role in women's fertility decision-  
136 making (Hammarberg et al., 2017) with the lack of a partner or a suitable and ready partner being a common  
137 reason that women delay parenthood (Hammarberg & Clarke, 2005; Holton et al., 2011). Much of this  
138 research has been conducted using quantitative methods. A small body of qualitative research has focused on  
139 the lived experience of fertility and reproductive decision-making giving us a glimpse of the processes and  
140 experiences at play through an exploration of individual accounts and personal meanings. For example, this  
141 research has shown that the complex interplay between individual, familial and social factors influences  
142 women's fertility decisions (Benzies et al., 2006) and that 'whether' and 'when' to have children are salient  
143 fertility decisions that are considered a normal part of the life course (Alvarez, 2018). Other research has  
144 examined the lived experience of delaying childbearing and found that women often experience the timing of  
145 starting a family to be dictated by circumstance rather than an active, conscious choice (Cooke et al., 2012).  
146 There is a need to know more about the lived experience of making fertility decisions in general, but  
147 especially after exposure to a fertility awareness intervention.

148 Thus, the overall purpose of this qualitative follow-up study was to examine women's perceptions and  
149 experiences of fertility and assessment and counselling six years after attending the FAC clinic in  
150 Copenhagen, Denmark. A previous paper from this study examined the participants' perceptions of the FAC  
151 clinic as a fertility awareness intervention (Koert et al., 2020). The current paper explored women's lived  
152 experience of making fertility decisions in the six years after receiving personalized fertility education,  
153 assessment and counselling at the FAC clinic. The study study of lived experience focuses on how people  
154 live through and react to their experiences of every day life events. It "privileg[es] experience as a way of  
155 knowing and interpreting the world" (Boylorn, 2008, p. 490). As such, we can develop a nuanced, in depth  
156 understanding what it is like to make fertility decisions after attending the FAC clinic by examining the lived  
157 experience of those who have experienced it.

158

159

## Materials and Methods

### 160 Design and Procedure

161 A qualitative study using a phenomenological perspective was conducted to answer the research question.  
162 Phenomenology is the study of the lived experience of a particular phenomenon from the point of view of  
163 those who experience it (van Manen, 1990).

164 A research study using a phenomenological perspective aims to generate rich, detailed accounts of personal  
165 experience to develop a nuanced understanding of a phenomenon of interest that is not well-known (Patton,  
166 2014).

### 167 Setting

168 The FAC Clinic was opened at the end of 2011 in Copenhagen, Denmark and located in Rigshospitalet,  
169 Copenhagen University Hospital. See Hvidman et al. (2015) for details on the FAC clinic.

### 170 **Data Collection**

171 A semi-structured interview guide was developed that included open-ended questions exploring women's  
172 lived experience of making fertility decisions after attending the FAC clinic. The interview guide included  
173 questions about the topic of fertility decision-making including the guiding question: "What has it been like  
174 to make fertility decisions after attending the FAC clinic?". Questions on the topics of reasons for attending,  
175 if/how their needs had been met, their understanding of the information provided and their general  
176 perception of the FAC clinic were also asked and data specific to these topics have been previously  
177 published in Koert et al. (2020).

178 Before the study was started, we (co-authors) considered our preconceptions regarding the lived experience  
179 of making fertility decisions after attending the FAC clinic. We assumed, that attending the FAC clinic may  
180 have an impact on women's fertility decision-making, given what we knew from previous studies conducted  
181 one year post intervention (Sylvest et al., 2018). However, we did not assume to know the nuances in the  
182 lived experience of making fertility decisions over time. In order to make the questions exploratory and not  
183 restricted by our preconceptions, we remained aware of this assumption during the interview and analysis  
184 process. Open-ended and non-leading questions were asked to encourage exploration of all experiences of  
185 fertility decision-making.

186 In order to ensure trustworthiness of the study findings, we used the concepts of data saturation and  
187 information power to guide our decisions regarding number of participants included. Data saturation occurs  
188 when after conducting several interviews, no new aspects of the experience are added by additional  
189 interviews. A review of qualitative studies found that on average, data saturation was reached by 12  
190 interviews (Guest et al., 2006). Information power suggests that the more information the sample holds, the  
191 fewer participants needed (Malterud et al., 2016). If the interviews are rich and in-depth, there is more  
192 information power. In this study, we conducted over 20 interviews to ensure we met these criteria.

193 The inclusion criteria included: having attended the FAC clinic in early 2012 and agreeing to be interviewed  
194 in person in English. Between February and March 2018, we extracted the names and Danish Personal  
195 Identification (CPR) numbers of women from a database of women who had attended the FAC clinic and  
196 agreed to be contacted for future research. We sorted by date of attendance starting from January 2012 (first  
197 year of operating). Names of potential participants were selected consecutively from the start of the list and  
198 sent out in batches of ~40 until data collection was finished. The recruitment notices were sent using the  
199 national Health Care electronic system.

200

201 In total, 141 notices were sent, 35 women indicated they wished to participate and ultimately 24 interviews  
202 were held due to scheduling or other issues (e.g., limited interview period; cancel due to illness). A detailed  
203 summary of the recruitment procedure is available in Koert et al. (2020). The interviews were conducted by  
204 EK, a Ph.D. and psychologist with experience in qualitative research. The interviews were held at  
205 Rigshospitalet, or the participants' work or home according to their preference between February and March  
206 2018. The interviews ranged from 60 and 94 minutes (mean 73 minutes). Single interviews were held with  
207 only the interviewer and participant present. Field notes were written after each interview to document the  
208 interview conditions, observations on non-verbal communication, and reflections on the participants'  
209 experience. The interviews were audio-taped and transcribed verbatim.

### 210 **Data Analysis**

211 With a phenomenological perspective, the focus is on identifying common themes regarding the lived  
212 experience of a particular phenomenon. There are several available procedures for how the themes can be  
213 developed. We selected Braun and Clarke's (2006) process for thematic analysis because it can be used  
214 within various methodological frameworks. It is an inductive, bottom-up approach where themes are data  
215 driven. The analytic process involved the following steps after the interviews were transcribed verbatim: 1)  
216 *familiarizing self with the data*: the transcripts were read several times in order to become immersed in the  
217 participants' experiences; 2) *generating initial codes*: sections of the transcript (quotations) were labelled  
218 with a code that described the key meaning; 3) *searching for themes*: after all of the transcripts were coded  
219 and a code list was developed, the codes were sorted into potential themes according to similarities in  
220 meaning; 4) *refinement of themes*: all codes and quotations were re-read to ensure they formed a coherent  
221 pattern, changes made, themes re-worked and new themes developed. A thematic map was developed and  
222 considered in relation to the whole data set (returning to review the full transcripts) and whether these themes  
223 accurately reflect the meaning of the data as a whole; 5) *defining and renaming themes*: themes were defined  
224 and refined and a detailed analysis was written for each of the themes. Themes were considered in relation to  
225 each other. Questions were asked to deepen the analysis such as 'What does this theme mean?' 'What are the  
226 assumptions underpinning it?'. In order to develop an overarching theme from the themes, questions such as  
227 'What is the overall story the themes reveal [about the lived experience of making fertility decisions after  
228 attending the FAC clinic]?' were considered (Braun & Clarke, 2006, p. 24). Trustworthiness of the analyses  
229 were ensured through several methods. Recruitment until saturation of data (i.e., no new themes or  
230 information arise in each additional interview; Saunders et al., 2018) was used as a criterion to ensure the  
231 research question had been explored in detail. Next, the analyses were shared with the co-authors for review  
232 at several stages, discussed in detail, and integrated into the output at each stage (e.g., code list, initial  
233 themes, thematic map). First, after EK coded 25% of the interviews, two co-authors read and confirmed that  
234 they agreed with the codes. Next, an initial list of sub-themes and themes was developed by EK and



235 discussed in detail with three of the co-authors. Changes were made based on discussion. All co-authors  
236 provided input into the map of the themes. Finally, a summary of themes, sub-themes, descriptions and key  
237 quotations was developed and approved by all co-authors. No feedback on the analysis was requested from  
238 the participants.

### 239 **Ethical Approval**

240 The study followed the Helsinki Declaration on human research ethics (World Medical Association, 2013).  
241 Informed consent was obtained from all participants before beginning the interview. The consent process  
242 involved providing verbal information about the purpose of the study and the interviewer's background.  
243 Participants confirmed that they had read the study information and understood that their participation was  
244 voluntary, that no identifying information would be published and that they were free to withdraw from the  
245 study at any point. The Danish Data Protection Agency approved the study (approval number: 514-0555/20-  
246 3000).

247

248

## **Results**

249 The majority of the women (21 women, 87.5%) became parents in the six years after attending the FAC  
250 clinic with nine trying to become pregnant in the year immediately after attending the FAC clinic. All who  
251 had tried to become pregnant had given birth to at least one child (n=21). The remaining three women  
252 (12.5%) were childless and had not tried to become pregnant but wished for a child in the future. All data on  
253 demographics and parental status is provided in Table 1.

254 Six years later, the women were at different stages of making fertility decisions: some having just recently  
255 had a child, some having achieved their ideal/desired family size, others grappling with the reality of not  
256 achieving their ideal/desired family size or their preferred vision of a family (e.g., two parents) and some still  
257 childless and single. The overarching theme regarding the experience of making fertility decisions after  
258 attending the FAC clinic was: **Fertility decisions are guided by the 'family clock'**. There were four  
259 themes: *1) Deciding to 'get started' by attending the FAC clinic; 2) Sense of making informed and*  
260 *empowered decisions; 3) Influence of partner status on fertility decisions; and 4) Decisions dictated by*  
261 *circumstance over preference or knowledge*. See Figure 1 for the thematic map. The overarching theme and  
262 the four themes are described in detail below with illustrative quotations in italics. Each of the themes  
263 corresponded to one of the common fertility decisions (e.g., *when* to start; also see Figure 1).

264 Overarching theme: **Fertility decisions are guided by the 'family clock'**

265 In each of the four themes, the women described how their fertility decisions were motivated by their  
266 personal preferences and intentions regarding parenthood. They spoke of common fertility decisions

267 including: *when* to try to become pregnant; *how* many children to have and *preferred spacing* between them  
268 (how far apart). The women's accounts also showed that their preferences regarding the decision of *how* to  
269 have a child: with their current partner, a new partner, as a solo mother, and/or using assisted reproduction  
270 was also an important consideration in their fertility decision-making.

271 We use the metaphor of a 'family clock' to describe the women's *personal preferences and intentions*  
272 *regarding parenthood and their related fertility decisions* in contrast with the metaphor of the 'biological  
273 clock' which generally refers to the biological / physical urges regarding timing of parenthood. The  
274 preferences represented in the women's 'family clock' were value-based regarding the 'ideal circumstances'  
275 or required preconditions in which to have children and their preferred vision of a family.

276 In some cases, women had to decide whether to shift their 'family clock' given the reality of their personal,  
277 economic and relational circumstances and their current fertility potential. For instance, some women  
278 intended or preferred to parent with a partner. But if they were still single in their late 30s or early 40s, they  
279 needed to consider solo parenthood or forgoing parenthood altogether if they could not find a partner while  
280 they were still fertile. The majority of the women saw having two children as the ideal/preferred vision of a  
281 family, but many had to shift this vision, given that they had difficulty becoming pregnant with their first  
282 child or did not have the structural or relational support to have more than one child.

283

#### 284 **Deciding to 'get started' by attending the FAC clinic**

285 There are two subthemes within this theme: Attending the FAC clinic is a fertility decision and Fertility  
286 decisions made based on information provided at the FAC clinic.

#### 287 ***Attending the FAC clinic is a fertility decision***

288 The women saw attending the FAC clinic as a decision in itself, and in many cases their first active fertility  
289 decision.

290 *My husband said he didn't want to know. So it was my decisions yeah to get this information.*

291 *I was more curious about it. So that as well was a big decision.*

292 They had been thinking about their fertility before attending the FAC clinic, in many cases worrying about  
293 their fertility, so calling the FAC clinic was a way of taking control and making an active choice to seek out  
294 information about their fertility. Attending the FAC clinic was experienced as a positive decision to be better  
295 equipped with knowledge for future decisions.

#### 296 ***Fertility decisions made based on the information provided at the FAC clinic***

297 All of the women believed that the FAC clinic was an important and influential factor on their fertility  
298 decision-making. They connected attending the FAC clinic and the information they received with their  
299 subsequent fertility decisions – particularly about the decision of *when* to try to become pregnant:

300 *We decided that we were going to try to have kids soon after that [attending FAC clinic]*  
301 *because we didn't know if it would be difficult or not.*

302 After attending the FAC clinic, women described feeling motivated to make a decision and take action to  
303 pursue their fertility goals even if the decision was to wait. Some described how attending the FAC clinic  
304 accelerated or slowed down their fertility decision-making: *'Maybe it got us started earlier than we thought*  
305 *we would'*.

306 Delaying pregnancy was also seen as a decision in itself – *'now I can wait'*. *'I was able to make the choice to*  
307 *do nothing'*.

308 Along with influencing the *when* to start trying to become pregnant decision, the women's accounts show  
309 that attending the FAC clinic also impacted the *'how'* question (how to have a child: with this partner, a new  
310 partner, as a solo mother, and/or using assisted reproduction).

311 *I still didn't have a boyfriend so I had to start OK I have to do it myself and I sort of had to*  
312 *make that decision.*

313 Examples of decisions made and actions taken included initiating conversations with partner about family  
314 preferences, discussions with friends/family about possibility of solo motherhood, deciding to leave  
315 relationship in which their partner was not ready or willing to have children, and exploring fertility treatment  
316 options (e.g., IVF, egg donation). As one woman described, attending the FAC clinic was experienced as a  
317 little 'push' to think about and make decisions:

318 *I knew that I wanted to have a child, for me it [attending FAC clinic] was a way to get a little*  
319 *push to do it and not to wait maybe 6 months or a year and I was afraid I'd get onto the*  
320 *wagon too late. Maybe too, it helped me make the decision I'd say.*

321

## 322 **Sense of making informed and empowered decisions**

323 The women wished for specific, detailed and up-to-date knowledge on their fertility potential in order to  
324 make their fertility decisions. The women described how they experienced calling the FAC clinic to make an  
325 appointment as an empowered decision to seek out information and take control of their family plans. After  
326 attending the FAC clinic, women talked about feeling equipped with knowledge regarding their personal

327 fertility status to make informed and empowered decisions, in particular the decision of *when* to try to  
328 become pregnant.

329 *We were shown that yes everything is good and when you start it shouldn't be a problem from*  
330 *both of you, so for us we knew OK we can take a breather for a year or two.*

331 Women that were told at the FAC clinic that their fertility was declining described feeling a sense of pressure  
332 to start trying to become pregnant, but also a sense of relief that they had not missed their opportunity to  
333 become a parent and could still make an informed choice. Thus, the women experienced their decision to  
334 start trying to become pregnant in these circumstances as an empowered and informed one.

335 *OK it was a bad result. You can cry for a day or two and then what can I do then? Just search*  
336 *and try to find a solution.*

337 *It [attending FAC clinic] gives you more force, more power to actually make your own*  
338 *choices and to know that you did something. Maybe it won't end up the way you thought but*  
339 *at least you did something.*

340 For all women, the sense of making informed and empowered decisions was common in one to three years  
341 after attending the FAC clinic. As time since attending passed, some women described a wish for additional  
342 information regarding their current fertility to aid their decision-making. For example, after a first pregnancy  
343 or if several years had passed since attending the FAC clinic, they were uncertain about their current fertility  
344 status and potential. In these cases, women wished for an opportunity to attend the FAC clinic again.

345 *If someone did offer me to come again I would go right away.*

346 The women described how their wish for this information was driven by their general sense that fertility  
347 declined with age, knowledge that was clearly remembered from the consultation at the FAC clinic that  
348 provided information on the age-related fertility decline.

349 Women also described wishing to receive additional guidance around their subsequent fertility decisions,  
350 such as what are their options in their current personal, relational and economic circumstances at this stage of  
351 their lives?

352 *It could be nice to talk with somebody who did this work, saying OK what is your options*  
353 *where are you now?*

354

355 **Influence of partner status on fertility decisions**

356 The women's accounts illustrated that their partner status influenced the decision of *how* to have a child the  
357 most out of the common fertility decisions. The women described three distinct experiences. First, having the  
358 'right' and 'ready' partner facilitated fertility decision-making. Second, deciding to prioritize parenthood  
359 over partnership in the short term, and third, by no partner meant no baby.

360 Having a supportive, suitable partner with the same fertility goals increased women's sense of empowerment  
361 and control over their fertility decisions. For many women, meeting the 'right' partner accelerated their  
362 fertility decisions. For example, some women described how any uncertainty or lack of readiness for  
363 parenthood disappeared when they knew they were making the decision to have a family with the right life  
364 partner.

365 *...because he was quite keen on it [having a child] and he told me straight away that he would*  
366 *like to have some kids with me so I was like oh! Let's do that.*

367 Those who decided to become solo mothers because they could not find a partner or had been in a  
368 relationship with a partner who was not willing nor ready to have a child experienced a combination of grief  
369 and empowerment. They expressed feelings of grief related to not having children the way they had pictured  
370 it according to their 'family clock'. However, they also felt the decision to become a solo mother was an  
371 empowered decision within their current circumstances. They expressed an awareness of how their fertility  
372 was time-limited but their opportunity to find a partner was not. Thus, it was important to take the chance to  
373 become a mother while they were still fertile and to decide to *prioritize parenthood over partnership* in the  
374 short term. All of the solo mothers described their hope to find a partner in the future, but all remained single  
375 at the six-year follow-up interview.

376 *I decided that I couldn't keep on waiting so I had to do it the other way around have the baby*  
377 *first and find the man afterwards because you couldn't if you wait too long perhaps it wasn't*  
378 *possible so it was, it was the age and the worry that I wouldn't be able to get pregnant so I*  
379 *thought yeah then the decision to say I can do this on my own.*

380 Other women did not want to parent on their own. Their 'family clock' included a preference to parent with a  
381 willing and suitable partner and they were unwilling or unable to shift this ideal. Thus, for them no partner  
382 meant there would be no baby. In the time since attending the FAC clinic, some of these women were  
383 fortunate to meet a partner. Others who had not were still waiting to have a child.

384 *...this is a dream of a family and something I want to do with someone else. I am not at a*  
385 *point where I want to go, where I have, I want to go and say I will do this on my own.*

386 Specifically, two of the three childless women (all currently single) had decided they only wanted to start a  
387 family with a partner and were actively seeking this out (e.g., searching for the right partner; nurturing a new

388 relationship). The third woman remained open to solo motherhood in the future if the circumstances were  
389 right.

390

### 391 **Decisions dictated by circumstance over preference and knowledge**

392 Women generally experienced making the decision of *when* to have a first child as an empowered, informed  
393 choice influenced by their preferred ‘family clock’ and knowledge of their personal fertility status provided  
394 by the FAC clinic. The women’s experiences demonstrate that making the decision of *how many* and *how far*  
395 *apart* was more complex with circumstances playing a role over preferences and knowledge.

396 Those who achieved their desired family size explained that their decision to have a second child was  
397 primarily motivated by age – both their own/partner’s age (i.e., not wanting to be too old) and their first  
398 child’s age (i.e., not wanting too many years in between children). For these women, making the decision  
399 regarding a subsequent child felt easier than their decision to have their first child, because they were already  
400 parents.

401 *I think it was just sort of natural after our first is 3 now, turned in January and it just became*  
402 *kind of natural when she turned two that we just slowly started thinking about it.*

403

404 However, more than half of the women in the study said that they had not achieved their desired family size  
405 in the six years since attending the FAC clinic. These women explained that their decision regarding having  
406 a subsequent child felt restricted due to their circumstances. They did not experience this as an empowered  
407 decision motivated by their preferences or knowledge, but rather a decision made by default accompanied  
408 with feelings of grief and regret. They cited previous fertility problems/age related infertility, increasing age,  
409 or their personal and relational circumstances (e.g., solo mother, financial situation) as factors restricting  
410 their options. This group of women included those who had tried to become pregnant with a subsequent child  
411 unsuccessfully and those who had not tried due to their personal circumstances.

412 Age was also an influencing factor in this group’s fertility decision-making and commonly cited as the  
413 reason for not achieving their preferred family size. Some with age-related infertility underwent fertility  
414 treatment to have another child and were unsuccessful. Some had had difficulty becoming pregnant with the  
415 first child due to age-related infertility and felt it would be too difficult or impossible to have another child.  
416 Others thought the fertility treatment necessary to become pregnant with a second child was too costly. Many  
417 described a felt sense of being ‘too old’ to have more children related to lower energy levels with increasing  
418 age. Others shared they believed they were beyond the age limit in which they would be comfortable trying  
419 to become pregnant with another child due to decreased chances of becoming pregnant and obstetric and  
420 neonatal risks associated with advanced maternal age.

421 All of the solo mothers wished they had a larger family but felt this decision was restricted by a combination  
422 of their advanced age and relationship status. Being both a solo mother and an older mother was too much in  
423 terms of risks related to advanced age (i.e., maternal and fetal risks) and responsibility and demand on their  
424 time and energy. They felt they only had personal and economic resources for one child.

425 *Because I really wanted to have another one but because I am still alone with my son I don't*  
426 *think I can manage to have two children on my own to be honest. It's too much.*

427 *If I had a second child I would have to have it too soon because of the age. Like I said if I had*  
428 *had the first child at 31, or 35 I could perhaps do it when she was 3 or 4 but I anticipate that I*  
429 *would be too old when I am 42 or something like that. I don't think I am up for that. Alone.*

430 Regardless of relationship status, women described feeling grief and regret that they were unable to achieve  
431 their desired family size. The women experienced a sense of loss regardless of whether they had tried to  
432 become pregnant or not because it involved the loss of the dream of their preferred family ('family clock').

433 *It feels sad. Very sad. I am going to cry. It's super sad but that's how it is.*

434 *So now I think I'm 45 it's too late now. So I think I am still quite sad about it.*

435 Those who had accomplished motherhood but were unable to achieve their desired family size were faced  
436 with reconciling and making peace with their circumstances, to actively decide to shift and revise their  
437 'family clock' and to feel grateful for the child they had.

438 *...there has been a lot of crying that we didn't have a second child but we are just being really*  
439 *humble that we actually got one.*

440 This was not an easy task and the majority of the women who had not achieved their desired family size  
441 were in the midst of grappling with this altered reality when interviewed (i.e., decision that had been made  
442 by default).

443

444

## Discussion

445 The findings show that women have very clear preferences for the way they want their family to look (timing  
446 of when to start, how many children, preferred spacing) and the circumstances in which to have them (how,  
447 for example with a willing partner) and their fertility decisions are influenced by these preferences. We have  
448 called these preferences and intentions the women's 'family clock'. Many of these preferences are consistent  
449 with Miller and Pasta's (1995) common fertility intentions in their adaptation of the Theory of Planned  
450 Behavior for fertility decision-making: child-desire (whether to have children), child-timing (when to have a  
451 child), and child number (how many children wish to have) while demonstrating that preferences regarding

452 ‘*how*’ to have a child (e.g., with or without a partner) are particularly salient in the lived experience of  
453 fertility decision-making. All of the women in the study expressed a child-desire. Some women shifted their  
454 preferences regarding their fertility decisions in response to their life circumstances in order to become  
455 parents, while others continued to hope for their ideal scenario (e.g., deciding to become a solo mother  
456 versus continuing to search for a partner). In our study, partner status was particularly salient in the women’s  
457 experience of making fertility decisions after attending the FAC clinic. In some cases, women met the ‘right’  
458 partner after attending the FAC clinic, which accelerated the fertility decision-making process. A few  
459 remained childless due to their lack of partner. Others decided to prioritize parenthood over partnership in  
460 the short term with the hope of meeting a partner in the future.

461 In Sylvest et al. (2018) one-year follow up study with women who attended the FAC clinic, many had made  
462 decisions regarding their fertility, but several women described remaining ‘in limbo’. In our study (no  
463 overlapping participants) women were no longer ‘in limbo’ six years later – all but one identified they had  
464 made active decisions about their fertility (deciding to conceive, searching for partner) in the time since  
465 attending the FAC clinic and felt these were empowered, informed decisions. In this way, consistent with  
466 Sylvest et al. (2018) attending the FAC clinic acted as an external ‘cue to action’ as described in the Health  
467 Belief Model (Glanz & Bishop, 2010; Rosenstock, 1974) to stimulate the decision-making process to engage  
468 in health-promoting behaviours (i.e., actions to facilitate pregnancy). The decision of ‘when to start’ was  
469 particularly salient and consistent with their reason for attending the FAC clinic (Koert et al., 2020). The  
470 women’s accounts show that the decisions of ‘when to start’ and ‘how’ were also influenced by the Theory  
471 of Planned Behavior’s concept of ‘perceived behavior control’, that is, the degree to which the person  
472 believes they can act (Miller & Pasta, 1995). Partner status was a key factor in perceived control with those  
473 with ready, willing partners believing they could act (start to try to become pregnant).

474 The women in our study believed that attending the FAC clinic played a role in their fertility decision-  
475 making. Their accounts show that attending the FAC clinic was in itself a fertility decision that influenced  
476 subsequent fertility decisions. Although the women’s sense of empowerment to make informed fertility  
477 decisions was particularly present in the first one to three years after attending the FAC clinic in regard to the  
478 ‘when to start’ question, their accounts show that their subsequent fertility decisions in later years (e.g., four  
479 to six years after attending FAC clinic) continued to be impacted by the information they received at the  
480 FAC clinic. The information became integrated into their previous knowledge and experience and was long-  
481 lasting. For example, the women retained a general sense that fertility declined with age and even after 6  
482 years clearly remembered the age and fertility graph shown at the FAC clinic to illustrate age-related fertility  
483 decline. The information made them aware that their fertility was not infinite and they could not delay the  
484 decision to have a child (or an additional child) indefinitely. They wished for more of the same information  
485 and guidance as provided at the FAC clinic to aid subsequent decisions in the years after attending the FAC



486 clinic. The findings underscore that in order to promote empowered, informed decision-making, information  
487 and guidance are needed across the reproductive life span and fertility decision-making period in particular if  
488 pregnancy is delayed after attending the FAC clinic or with regards to the likelihood of additional  
489 pregnancies.

490 Although all those women who decided to try to have a child (n=21) were successful in having at least one  
491 child, less than half of the women stated that they had achieved their desired family size (two or more  
492 children). Despite being aware of age-related fertility decline, many ran out of time to have the number of  
493 children they desired. The women's accounts reveal the complexity of the decision to have another child. In  
494 many cases, the women felt their decisions to have an additional child were dictated by circumstance (e.g.,  
495 their age or relationship status) rather than preference or knowledge. As such, they did not achieve their  
496 image of their desired family and this was accompanied with feelings of grief and regret similar to reactions  
497 to secondary infertility (Hammer Burns & Covington, 2006). Our findings underscore the importance of  
498 helping women and men to achieve their desired family size rather than only their first child. Interestingly,  
499 this is in contrast to current public policy in Denmark where citizens can access free fertility treatment in  
500 public clinics to have their first child but public funding is unavailable for subsequent children.

501 These findings suggest that when discussing when to try to become pregnant with women of reproductive  
502 age, it is important to map out and plan future pregnancies according to women's 'family clock' (i.e.,  
503 preferences regarding family size and preferred spacing between children) so that women are more likely to  
504 achieve their family building goals. When attending the FAC clinic, the women in the study were primarily  
505 focused on the decision of 'when to start' and how long they could delay childbearing, which is consistent  
506 with previous research conducted in the FAC clinic that surveyed women's reason for attending (Birch  
507 Petersen et al., 2015; Hvidman et al., 2015; overlapping samples).

508 However, our study's findings suggest that in order to avoid having a smaller family than intended, focus  
509 should be shifted to 'when do I need to start to achieve my preferred family size?' Habbema et al. (2015)  
510 have developed a model regarding when people should try to start to become pregnant according to the  
511 number of children they would like, and this has later on been integrated into the FAC clinic. It may also be  
512 that women's reality and life circumstances (e.g., advanced age or solo motherhood) does not fit their 'family  
513 clock' and shifting plans is necessary in order to promote satisfying and informed fertility decision-making.  
514 For example, women may not have control over some circumstances (e.g., relationship status), but they can  
515 avoid age-related fertility issues (most common circumstance preventing their desired family size) if they  
516 start earlier. If they are unable to start earlier, the FAC clinic could facilitate the formation of realistic  
517 expectations regarding what is possible within particular age ranges in order to prevent grief and regret  
518 regarding unachieved family size as was described by the women in the study.

519 This fits with previous research on the Theory of Planned Behavior and fertility intentions which has been  
520 used as a model to explain how individuals make decisions in their social context with varying sense of  
521 control over their behaviours (Ajzen & Klobas, 2013; Klobas, 2011; Miller & Pasta, 1995). Researchers have  
522 found that in particular, people's perceptions over control of their decisions are the most significant predictor  
523 of intentions to delay childbearing (Williamson & Lawson, 2015). In the case of the present study, the  
524 women believed that it was possible to control their fertility. They sought information at the FAC clinic in  
525 order to give them a sense of control over their plans and decisions regarding their 'family clock'.

526 Fertility education interventions such as the FAC clinic have been developed with the goal of promoting  
527 informed and satisfying fertility decisions and to assist men and women to achieve their family building  
528 goals (e.g., Hvidman et al., 2015; Pedro et al., 2018). Our qualitative follow-up study illustrates that women  
529 perceive that attending the FAC clinic impacted their experience of fertility decision-making, particularly  
530 their experience of feeling empowered to make informed decisions regarding when to start trying to become  
531 pregnant. It provides support for the provision of personalized interventions as part of prevention efforts  
532 given the need for specific, detailed knowledge and the need for reassurance of their fertility potential. It is  
533 likely that a combination of different strategies at different points in the reproductive life course are needed  
534 in order to be fully effective in promoting informed fertility decision-making and preventing infertility and  
535 unintentional childlessness. Whilst this research focused on exploring women's lived experience of fertility  
536 decision-making, quantitative research is needed to determine efficacy of different interventions at specific  
537 time points and its causative effect on fertility decision-making.

538 Over half of the women shared that they perceived they were unable to achieve their desired family size due  
539 to life circumstances such as their advanced age. Thus, the decision of how many children to have and  
540 preferred spacing was made by default rather than as an active choice. It may be that decisions made by  
541 default are more difficult to accept given that control is attributed to external factors. Future research needs  
542 to operationalize the concept of 'informed and satisfying' fertility decisions to further measure the  
543 effectiveness of fertility education interventions like the FAC clinic.

#### 544 **Limitations**

545 The participants were self-selected from a larger study that included volunteers who were eager to have  
546 knowledge about their fertility. Thus, this is a special sample that was eager to speak about their experiences.  
547 In a qualitative study, diversity of opinions and examples is preferred. Representativeness is not required. In  
548 this study we included women with a wide range of reported FAC clinic advice (fertility looks 'fine', fertility  
549 is declining and childbearing should start now, potential fertility problems) and fertility trajectories (parents  
550 of 1-3 children, currently childless, solo mothers, mothers with partners, heterosexual/lesbian). Only 25% of  
551 the women invited to participate expressed interest in attending. We were not permitted to ask why  
552 participants declined due to ethical limitations. It may be that the English language requirement caused some

553 women to decline. As such we do not know the experiences of those that did not participate and we cannot  
554 expect that this group's experience is reflective of all women of reproductive age. However, the study  
555 benefits from a long-term follow-up period to explore women's perception of the impact of a fertility  
556 awareness intervention, and is the first to do so.

## 557 **Conclusion**

558 In summary, the FAC clinic and other similar interventions should be aware of the power they have in  
559 conveying knowledge and information that influences women's fertility decision-making. The findings  
560 highlight the value of personalized fertility awareness intervention that provides information tailored to the  
561 individual. As such, prevention efforts to prevent infertility and childlessness by increasing fertility  
562 awareness should include both personalized and general approaches to be most effective. In order to promote  
563 empowered, informed fertility decision-making, information and guidance are needed across the  
564 reproductive life span so that individuals can achieve their family goals and to create realistic expectations  
565 regarding what is possible within particular age ranges.

566

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## 569 **Disclosure of Interest**

570 JB reports that the risk evaluation form used at the Fertility Assessment and Counselling (FAC) clinic was  
571 inspired by the Fertility Status Awareness Tool FertiSTAT that was developed at Cardiff University for self-  
572 assessment of reproductive risk (Bunting and Boivin, 2010). JB also reports personal fees from Merck  
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574 outside the submitted work. The other authors report no conflict of interest.

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## 722 **Figure captions**

723 Figure 1: Women’s fertility decisions guided by their ‘Family clock’

724 Note: Themes (in circles) correspond to one of the common fertility decisions identified within the clock.

725 The ‘Family clock’ relates to the personal preferences and intentions regarding parenthood and their related  
726 fertility decisions.

727

## 728 **Author Biographies**

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737

738 **Randi Sylvest** graduated as a master in Public Health from Copenhagen University, Denmark. She is a PhD-  
739 student at the Fertility Clinic of Hvidovre Hospital, Denmark. Her research field includes qualitative research  
740 with focus on men, family formation, fertility treatment and fertility awareness. She has conducted over 100  
741 interviews. She is also working with quantitative studies including registries and questionnaires. Conducted  
742 nearly 20 original papers with peer-review and had presented at several big conferences worldwide.

743

744 **Ida Vittrup** is a PhD student at Copenhagen University Hospital Gentofte in the Department of  
745 Dermatology and Allergy. She graduated with a Master of Science (Medicine) from the University of  
746 Copenhagen, Denmark in 2016 and has subsequently completed her internship. Her research is focused on  
747 psychosocial consequences on patient and family of skin diseases (special focus on atopic dermatitis). She  
748 has most of her experience in quantitative research, working with the large Danish registries. She is also  
749 interested in and working with fertility assessment and awareness and is currently conducting a follow-up  
750 questionnaire study on the FAC clinic. She is an author of nearly 10 original papers with peer-review. She  
751 has presented at several big conferences worldwide and is a repeatedly awarded speaker.

752

753 **Helene Westring Hvidman**, MD, Ph.D, specialist registrar in Gynecology and Obstetrics at Rigshospitalet,  
754 Copenhagen University Hospital, research within the field of reproductive medicine focussing on the  
755 prediction of women's future fertility, ovarian reserve assessment and active part in establishing the fertility  
756 assessment and counselling clinic.

757

758 **Kathrine Birch Petersen** is a specialist in Fertility and OB/GYN. She is Medical Director/CEO of The  
759 Fertility Partnership in Denmark. Her PhD is about the Fertility Assessment and Counselling Clinic at  
760 Rigshospitalet - the first of its kind worldwide. Primary research areas are ovarian reserve, fertility awareness  
761 and female fertility. Has written several peer reviewed articles about fertility and early pregnancy. Fertility  
762 expert with strong management, organizational and strategical skills. International speaker with a substantial  
763 research network and collaborations worldwide. Has a Master in Public Governance from Copenhagen  
764 Business School. Previous chairman of the Danish Fertility Society.

765

766 **Jacky Boivin** is Professor of Health Psychology and Practitioner Health Psychologist at the the School of  
767 Psychology, Cardiff University. She is recognized internationally for her systematic and research-oriented  
768 perspective on the investigation of psychosocial issues in fertility health. She has led many pioneering  
769 projects, published many peer-reviewed articles, and produced, with her research group, many tools to  
770 support the care of people with fertility problems (FertiQoL, PRCI, FertiSTAT, DrawingOut -  
771 Endometriosis). She is Section Editor for Reproductive Biomedicine Online ("Reproductive Technology and  
772 Society") and Associate Editor for Human Reproduction Open, and is on the Executive Committee of the  
773 British Fertility Society for Evidence-Based Patient Support. Her current research is focused on cognitive  
774 aspects of fertility, fertility education and global fertility health.

775

776 **Anders Nyboe Andersen** is a Professor Emeritus, Reproductive Medicine, the Fertility Clinic,  
777 Rigshospitalet, Copenhagen University Hospital. Copenhagen. He was head of the Fertility Clinic,  
778 Righospitalet from 1995-2011 and head of the Fertility Clinic, Herlev from 1991-1995. He has worked with  
779 Assisted Reproductive Technology for the last 30+ years. He developed the Fertility and Assessment  
780 Counselling Clinic concept in Copenhagen, Denmark in 2011 and expanded to several clinics. Total of 310  
781 scientific articles, Assistant Editor of Acta Endocrinologica from 1988 – 1992 and Human Reproduction  
782 2006 – 2009. University advisor for a total of 24 Ph.D. students. ESHRE, Member of executive board of  
783 ESHRE 1998 – 2002, Chairman of "European IVF Monitoring" 2006 - 2009 and Chairman of the Danish  
784 Fertility Society from 2001-2005. He received the Howard Jacobs Award from the British Fertility Society in  
785 2016.

786

787 **Lone Schmidt** is Professor wsr, DMSc, PhD, MD in reproductive health and infertility at Department of  
788 Public Health, University of Copenhagen. Her research focuses on somatic and mental health consequences  
789 of infertility and its treatment; how we can prevent infertility and its consequences; and studies regarding

790 family formation. Lone Schmidt established in year 2000 a cross-disciplinary research programme: The  
791 Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme. The COMPI research  
792 group is one of the internationally leading research group in the field and Lone Schmidt is still the Principal  
793 Investigator. Her research group is involved nationally and internationally in large cohort studies among  
794 fertility patients and a number of qualitative interview studies. She has published 150+ scientific papers and  
795 book chapters, personal H-factor 49. She has been member of the Steering Committee for Guidelines and  
796 Nomenclature in Infertility, World Health Organization (WHO) 2014-2016 and has since 2008 collaborated  
797 in different scientific and public health settings nationally and internationally to increase fertility awareness  
798 and prevent infertility.

799

800

801



802 Table 1

803 *Demographics and fertility outcomes*

	At intervention (2012) N (%)	At follow-up (2018) N (%)
<b>Demographics and fertility outcome</b>		
Age (M(SD))	33.5 (3.4)	39.5 (3.4)
<b>Marital Status</b>		
Married/Cohabiting	9 (38)	14 (58)
Single	15 (63)	10 (42)
<b>Parental status</b>		
No children	24 (100)	3 (13)
Parents		21 (88)
Partnered		14 (67)
Solo mother		7 (33)
<b>Number of children (n=21)</b>		
1 child <sup>a</sup>		14 (67)
2 children		6 (29)
3 children		1 (5)
<b>Year tried to become pregnant</b>		
Before FAC clinic		1 (5)
First year after attending		9 (43)
Second year		1 (5)
Third year		4 (19)
Fourth year		5 (24)
Pregnant without trying		1 (5)
<b>Wished for more children (n=21)<sup>c</sup></b>		
No (all had 2-3 children or currently pregnant)		8 (38)
Yes		13 (62)

804 *Note:*

805 Intervention = attending Fertility Assessment and Counselling clinic.

806 Cohabiting = living together. MAR= Medically assisted reproduction (any form of fertility treatment).

807 <sup>a</sup>Two women pregnant with second child.808 <sup>b</sup>Two deliveries were through donor insemination for lesbian couple.809 <sup>c</sup>Does not include 3 currently childless women that had not tried to become pregnant but wished for a child in the future

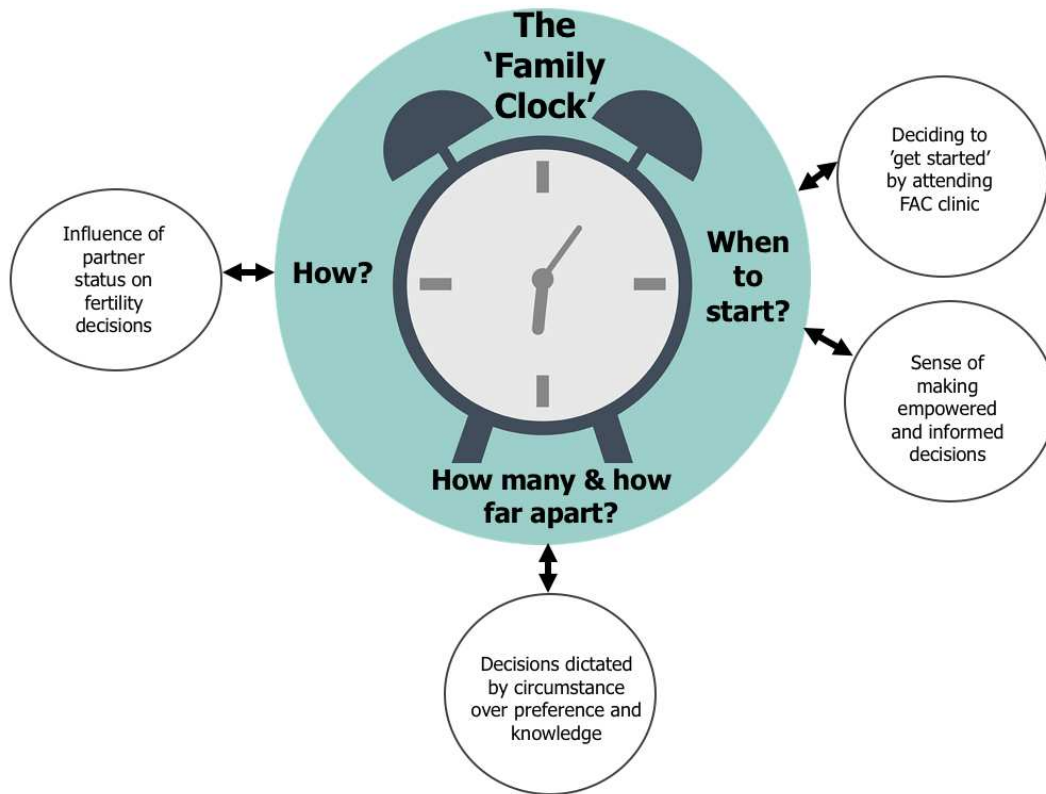
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Figure 1: Women’s fertility decisions guided by their ‘Family clock’



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815 Note: Themes (in circles) correspond to one of the common fertility decisions identified within the clock.

816

817 The 'Family clock' relates to the personal preferences and intentions regarding parenthood and their related  
 818 fertility decisions.

819