An unexpected bun in the oven? An exploratory research on unplanned pregnancies

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Introduction

Happily expecting: that is the way pregnant women are ideally described. The adjectives 'unplanned', 'unintended' or even 'unwanted' are less preferred terms to describe a pregnancy. Nonetheless they represent the reality of many women, even today. In France and The Netherlands up to one third of the pregnancies are unplanned (Rutgers Nisso Groep, 2007; Bajos, Leridon, Goulard, Oustry, Job-Spira, & The COCON Group, 2003, p. 997). Approximately half of these are terminated with an abortion (Bajos, e.a., 2003, p. 997). The other fifty percent is carried to term, mostly by women who have accepted the situation and look forward to becoming a mother. Unfortunately sometimes also by women who believe the pregnancy is too soon, too late or completely unwanted.

The likelihood of becoming unplanned pregnant is not evenly spread over the population. Earlier research shows that especially young, low educated and unmarried women face a high risk. Since the consequences of unplanned pregnancies are non neglect able for mother, father and child, knowledge about demographic, socio-economic and lifestyle determinants is important.

Measuring planning status

In the past, scholarly researchers have done much research on the area of unplanned pregnancies. Despite these efforts, few items have been developed to measure the concept 'pregnancy planning' (Zabin, 1999, p. 250).

A recently developed scale is the *London Measure of Unplanned Pregnancies* (or LMUP – see attachment 1). The scale is constructed in two phases. The first phase was a qualitative research in which pregnant women were asked what they thought concepts as 'unplanned', 'unwanted' and 'unintended' meant, with regard to pregnancies. This study showed that there was very little agreement in what women thought the different concepts meant (Barrett, & Wellings, 2002, p. 550). In other words, when measuring the pregnancy planning of two different women, you might be measuring two different things. One woman might code her pregnancy as unintended, while another woman might code the same pregnancy as perfectly intended. A researcher that limits himself to measuring one concept when doing research on unplanned pregnancies might miss part of the reality he wants to study. Other studies also showed that pregnancy planning is such a complex concept for women; it is not possible to grasp it in one simple question (Trussell, Vaughan, & Stanford, 1999, pp. 246-247; Moos, Petersen, Meadows, Melvin, & Spitz, 1997, p. 390; Fischer, e.a., 1999, s.p.). By measuring different dimensions of pregnancy intendedness, women are given the possibility to situate their pregnancy planning according to their own terms.

In the second phase, the scale was constructed, based on the results from the qualitative research. The LMUP measures six different dimensions in six questions: (1) use of anticonception, (2) timing of the pregnancy, (3) intendedness of the pregnancy, (4) wantedness of the pregnancy, (5) communication with the partner and (6) preparation for pregnancy. Questions 2, 3 and 4 measure the attitudes of women. With these questions women can express their subjective feelings toward
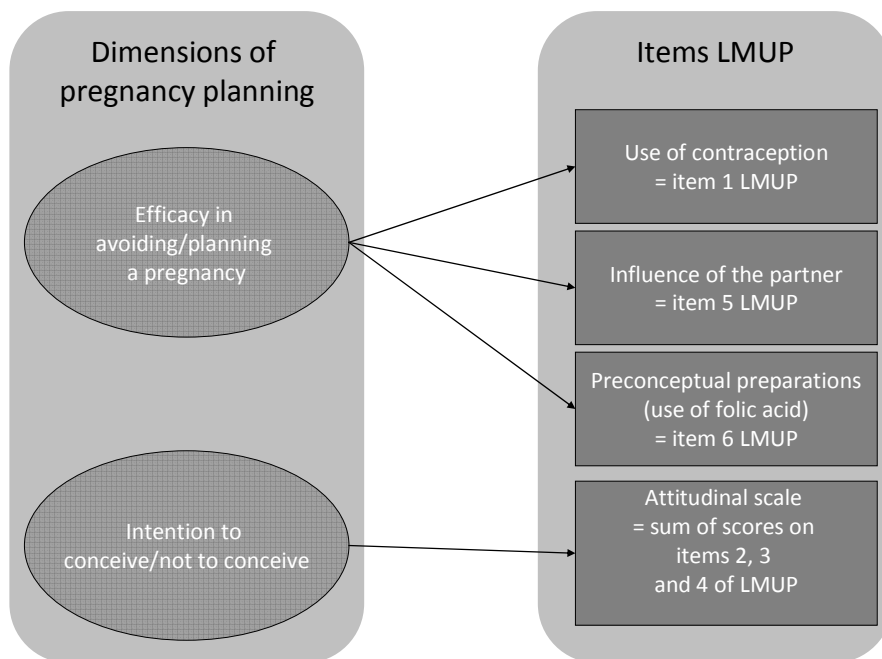
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the pregnancy. Questions 1, 5 and 6 measure the behaviour of women: they measure more objective items[1]. Each item of the scale is scored from zero to two, with zero indicating unplanned and two indicating planned. Summing up these scores, the pregnancies of women can be situated from zero to twelve, with zero meaning unplanned pregnant, and twelve indicating planned pregnant (Barrett, Smith, & Wellings, 2003, p. 431).

By using one figure to represent pregnancy planning, the scale represents this concept as a one dimensional concept. This is contradictory to what the research of Edin and others found. According to this study we have to distinguish two continua of pregnancy planning. The first is the level of efficacy in taking the necessary steps in avoiding a pregnancy (but also the level of efficacy in taking the necessary steps in planning a pregnancy). The second is the strength of the intention to conceive. For most respondents behaviour and attitudes were aligned: the stronger the intention (to avoid or not to avoid a pregnancy) the more the behaviour was adapted to it. A quarter of the respondents on the other hand were not consistent in their behaviour and attitudes: they did not want to become pregnant, but did not use birth control either (and were not sterile). This group choose most often to terminate the pregnancy and were most unhappy about it (Edin, England, Fitzgibbons Shafer, & Reed, 2007, p. 26).

When we would analyse the LMUP the classical way, the women who did not use birth control in the months prior to the pregnancy for example, would score higher on their total planning status and would in other words be regarded as more planned pregnant. The research of Edin clearly shows that not using birth control does not mean a woman is planning to become pregnant: it can simply mean she is not good in avoiding an unwanted pregnancy. In other words: she might score high on the intention not to conceive, but low on the efficacy to avoid this pregnancy. Since the different items of the LMUP made it possible to measure the two dimensions found in the study of Edin and colleagues, we analysed the different items of the scale separately. We believed this would give us a better insight in the concept of pregnancy planning. With the attitudinal items of the LMUP, we measured the strength of the intention to conceive. With the questions on behaviour prior to the pregnancy, we measured the efficacy in planning or avoiding a pregnancy.

Because the research of Barrett and other studies showed that women attach different meanings to the different attitudinal concepts, we analysed the different attitudinal items together. In other words, we summed up the scores of women on the attitudinal items and constructed this way an alternative attitudinal scale. Women can score between zero and six on this scale, with zero indicating that she has an unplanned pregnancy, and six indicating a planned pregnancy. The graph below gives a good overview of how we analysed the different items of the LMUP.

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[1] The numbering of items is analogue with the numbering of the different questions of the LMUP. For example: item 1 is measured through question 1, item 2 through question 2, etc. See attachment 1 for the precise question wordings and the scores on the different answers.

Dimensions of pregnancy planning

Efficacy in avoiding/planning a pregnancy

Intention to conceive/not to conceive

Items LMUP

Use of contraception = item 1 LMUP

Influence of the partner = item 5 LMUP

Preconceptual preparations (use of folic acid) = item 6 LMUP

Attitudinal scale = sum of scores on items 2, 3 and 4 of LMUP

Risk factors for unplanned pregnancies

Age is a frequently researched risk factor. Young (Bouchard, 2005, p. 628; Finer, & Henshaw, 2006, p. 92; Kost, & Darroch, 1995, p. 13) and older women have a higher risk of unplanned pregnancies than women in their socially accepted 'fertile' years (Dietz, e.a., 1999, p. 133; Henshaw, 1998, p. 27; Rasch, Knudsen en Wielandt, 2001, p. 1034).

According to the study of Edin and colleagues the intention to conceive is strongly affected by the nature of the partner relationship at the time of conception (Edin, England, Fitzgibbons Shafer, & Reed, 2007, p. 50). The more stable the romantic relationship is, the higher the intention status of the pregnancy (Edin, England, Fitzgibbons Shafer, & Reed, 2007, p. 47). Young women might be more often unplanned pregnant because they have a less strong intention to conceive, since they are less often in stable relationships. They are often in early relationships or not living together with their partner – which makes it difficult to discuss the use of birth control or the coming of a baby. If this is the case then age is not a risk factor, but relationship status and/or relationship length are. Earlier studies already found that married women have a higher pregnancy planning (Dietz, e.a., 1999, p. 133; Henshaw, 1998, p. 27). Women in long relationships have a higher pregnancy planning than women in early relationships (Bouchard, 2005, p. 634). The research of Williams shows that young women know the pregnancy intentions of their partners less. The same is true for unmarried women (Williams, 1994, s.p.). These women might have had less opportunity to discuss their fertility plans with their new partners. The research of Miller on psychological mechanisms for non use of contraception showed that respondents who established greater sexual intimacy have a greater contraceptive cooperation and mutual support between themselves and their partners (Miller, 1986, p. 31).

There are different reasons to assume that older and younger women are less capable of planning or avoiding a pregnancy. Older women might underestimate the possibility of becoming pregnant while having unsafe sex, a phenomenon called 'unrealistic optimism' (Frost, e.a., 2007, p. 96 and p. 97). A woman's fertility level starts to decline from her thirties, but that does not mean she can not become pregnant anymore. A recent research asked women who did not want to become pregnant their reasons for unprotected intercourse. One of the frequently mentioned

answers was that they already had unprotected intercourse for a while without getting pregnant (Nettleman, Brewer, & Ayoola, 2007, p. 150). Older women might become riskier in their sexual behaviour because they got away with it before.

Young women on the other hand are generally less experienced with sex and contraception and are often in relationships with equally inexperienced partners. Despite efforts on providing sex education, contraceptive questions remain complicated and the available answers are often no more than myths. Next to that, it is easy to imagine that it is more difficult for youngsters to access contraceptives. This is especially true for girls and boys living in small villages, where it is always possible to run in to family or neighbours when buying a package of condoms or waiting at the doctor's office to get a prescription for the pill.

Educational level is also an important risk factor for unplanned pregnancies. Low educated women face more unplanned pregnancies than high educated women (de Graaf, & Loozen, 2005, p. 30; Finer, & Henshaw, 2006, p. 93; Rasch, e.a., 2001, p. 1032).

In the available literature, multiple reasons are found for this effect. The article of Musick e.a. gives an overview of three possible explanations. The simplest reason is access to contraception. Unintended fertility is higher among the less educated because they do not know much about or cannot afford contraception. The research of Little e.a. also shows this: less educated women have less knowledge of how to use birth control correctly (Little, Griffin, Dickson, & Sadler, 2001, p. 450). This can lead them to use birth control ineffectively or not to use it, even when trying to avoid a pregnancy. There is no strong evidence for the fact that low educated or low income women have a limited access to contraception. A recent study asked unmarried low-income parents if they had ever been in a position where they wanted to use birth control but did not because they could not afford it. None of those with an unintended pregnancy confirmed this question (Edin, England, Fitzgibbons Shafer, & Reed, 2007, p. 42).

A second explanation is the relational and economic uncertainty faced by less educated women. Uncertainty about a relationship or an income source can lead to ambivalence about the appropriateness of child bearing. When these women feel that they will not reach an ideal childbearing situation – namely the situation of an economically stable couple owning a house - in a foreseeable future, they might settle with a 'good-enough' situation, creating ambivalent feelings toward the pregnancy. These women will not actively try to become pregnant, but they will not avoid one either (Musick, e.a., 2007, pp. 24-26).

The third explanation deals with efficacy and sense of control. People's sense of control is built up from experiences with challenges that one can handle. In an economically unstable situation, one may perceive a lack of control – the feeling that ones actions have no effect. This may turn into a self-fulfilling prophecy when it leads one to discard from actions with which one can avoid bad things to happen. This theory can be applied to unintended pregnancies. More years of schooling can make a woman more capable of understanding the risks of becoming pregnant, of making plans to reduce those risks and especially of executing those plans in order to avoid an unplanned pregnancy (Miller, 1986, p. 31). The theory can also be applied to the reaction of women on health campaigns (Musick, e.a., 2007, p. 28). In the Netherlands and Belgium women are advised to use folic acid in the months preceding a pregnancy. According to a Dutch research, low educated and young women follow this advice less than high educated and older women. When the study controlled for pregnancy planning, the effect became weaker, but did not disappear (Timmermans, Jaddoe, Mackenbach, Hofman, Steegers-Theunissen, & Steegers, 2008, p. 429). In other words, low educated and young women's lower folic acid intake can only partly be explained by the fact that they are more often unplanned pregnant.

Besides the theories found in the article of Musick, other explanations are possible. One theory states that women without a stable job or with income problems face more turbulent periods in their lives. It is possible that during these periods, these women cannot make the effort to effectively use birth control (Frost, e.a., 2007, p. 97; Rainwater, 1960, pp. 167-168). This does not

mean they have a careless attitude: it is possible that because of professional problems the contraception problem drops from the agenda (Bajos, e.a., 2003, p. 998).

Finally, it is possible that women in a weak societal position find themselves in a relationship with a power unbalance. Women with a weak socio-economic position can have less negotiation power compared with their partners. This is especially the case for women who rely on the condom or withdrawal as means of birth control. The non-use of condoms is often due to a decision of the male partner who refuses a method that limits his own sexual pleasure (Bajos, e.a., 2003, p. 998 referring to Holland, Ramazanoglu, Scott, Sharpe, & Thomson, 1999, p. 145). A research of Miller showed that when the husband does not like the used contraception method – mostly the condom or withdrawal – non use of contraception is more frequent (Miller, 1986, p. 31). The smaller negotiation power of women is also shown by the article of Williams. Low educated pregnant women indicated more often that their own fertility intentions differed from their partners'. This group of women was also less aware of the fertility intentions of their partners (Williams, 1994, s.p.).

Based on the information from the literature, we formulated the following hypotheses.

Table 1. Overview of hypotheses.

Item LMUP	Risk factor	Hypothesis	
Attitudinal scale - **Intendedness of the pregnancy** - **Wantedness of the pregnancy** - **Timing of the pregnancy**	Age	1A	Young and older women score lower on the attitudinal scale, than women in between these age groups.
	Relationship length	1B	Women in a short relationship score lower on the attitudinal scale, than women with a longer relationship length.
	Marital status	1C	Unmarried women score lower on the attitudinal scale than married women.
	Living situation	1D	Women who do not live together with their partner score lower on the attitudinal scale than women who live together with their partner.
	Educational level	1E	Low educated women score lower on the attitudinal scale, than high educated women.
Use of contraception	Age	2A	Young and older women use contraception less, when trying to avoid a pregnancy.
	Educational level	2B	Low educated women use contraception less, when trying to avoid a pregnancy.
Influence of partner	Age	3A	Young women talk less with their partner about their fertility plans, before they become pregnant.
	Relationship length	3B	Women in short relationships talk less with their partner about their fertility plans, before they become pregnant.
	Marital status	3C	Unmarried women talk less about their fertility plans with their partner, before they become pregnant.
	Living situation	3D	Women who do not live together with their partner, talk less about their fertility plans, before they become pregnant.
	Educational level	3E	Low educated women talk less with their partner about their fertility plans, before they become pregnant.
Preconceptual preparations - Intake of folic acid	Age	4A	Young women use folic acid less, when planning to become pregnant.
	Educational level	4B	Low educated women use folic acid less, when planning to become pregnant.

Method

To test the different hypotheses, data is collected from pregnant or recently pregnant women in the city of Hasselt from December 2008 until March 2009. Using a survey-questionnaire, women were asked questions about the planning status of their pregnancy, about their socio-economic and demographic characteristics, about their relationship to the father of the baby and about their reproductive history.

The questionnaires were distributed among women on different locations. We worked together with two gynaecologist departments and two maternity wards in two different hospitals, a pregnancy course from Child and Family[2], a midwife, a course baby massage and an abortion centre. The questionnaires were handed out by the nursing staff working in the different locations. The women could fill in the questionnaire on the locations or do it at home in their private environment. It took women approximately ten minutes to fill in the questionnaire. They could send the questionnaire back by post or hand it in personally to the person they received it from.

In the abortion centre we worked with a slightly different questionnaire. The question on preparations for pregnancy from the LMUP was dropped for this group, because the nursing staff from the abortion centre considered this question as a too sensitive question for women who choose to terminate their pregnancy.

Dependent variable. Before we used the LMUP in our Dutch questionnaire, we translated the original using the *translation back translation* technique. The English questionnaire was translated from English to Dutch by a person who speaks both languages fluently. In a next step the Dutch questionnaire was translated back to English, by a second person. In the end, the two English versions were compared and a definitive Dutch version was chosen. This procedure was performed twice for this questionnaire.

Independent variables. Respondents could tag the correct answer to indicate their educational level. The duration of the relationship was measured through an open-ended question. Respondents could answer the number of days, weeks, months or years they were a couple at the moment she became pregnant. To know the relation with the father of the child, we asked respondents to tag the correct description of their relationship. The possible answers were: 'We were not in a relationship', 'We once were in a relationship, but are not anymore', 'We are not living together, and have an unstable relationship', 'We are not living together, but have a stable relationship', 'We were living together, without being married' and 'We were married'. When respondents indicated they did not live together with the father of the child, they were asked were they lived. The could choose between the following categories: 'I lived alone', 'I lived with my parents' and 'Other'.

Results

Data. In total 197 questionnaires were filled in. 33 of them came from the abortion centre, 42 were filled in by women who had just given birth and 122 by women who were still pregnant. In the table below you see a division per location. Women who already gave birth filled in the questionnaire on average 7 days after the birth. The maximum duration between giving birth and filling in the questionnaire was 20 days. The pregnant women were on average 29 weeks pregnant, when they filled in the questionnaire.

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[2] Child and Family is a Flemish governmental institution working on preventive healthcare for young children. In this particular course, pregnant women were given a tour in the hospital and information on giving birth – what they had to expect, what could go wrong… This way women knew what they could expect on the day the baby comes.

Location	Number of received questionnaires
Abortion centre	33
Midwife	2
Course baby massage	2
Pregnancy course Child and Family	73
Gynaecologist Hospital 1	16
Gynaecologist Hospital 2	33
Maternity ward Hospital 1	22
Maternity ward Hospital 2	16
Total	197

The women were aged between 18 and 45 years old. The average woman was 30,46 years old. The average relationship length was 6,5 years with a minimum of zero days and a maximum of 23 years. Nine out of ten respondents lived together with their partner at the time of the pregnancy. The other ten percent lived alone, with their parents or with another partner. Half of our sample was married.

73% of the women had done higher education. This figure shows that our sample does not represent the general population. In 2008 approximately 23% of the people older than 15 years in Belgium were higher educated (FOD Economie, K.M.O., Middenstand en Energie, 03.02.2010). How this selection effect took place is not clear, but it shows that we have to be careful when analysing our data.

As we can see from the table below, there is very little variation in answers given on the different items of the LMUP. Most women situate themselves in the most planned category for each item, which probably is a consequence of our non representative sample.

Table 3. Items LMUP

Item 1 – The use of contraception (score)	Frequency (%)
Always (0)	13 (6,60)
Not on every occasion/method failed (1)	13 (6,60)
Never (2)	171 (86,80)
Item 2 – Personal circumstances/Timing (score)	**Frequency (%)**
Wrong time (0)	26 (13,20)
Ok, but not quite right time (1)	16 (8,12)
Right time (2)	155 (78,68)
Item 3 – Expressed intentions (score)	**Frequency (%)**
Not intended (0)	37 (18,78)
Intentions kept changing (1)	7 (3,55)
Intended (2)	153 (77,66)
Item 4 – Desire for motherhood (score)	**Frequency (%)**
Not wanted (0)	33 (16,75)
Mixed feelings (1)	10 (5,08)
Wanted (2)	154 (78,17)
Item 5 – Influence from the partner (score)	**Frequency (%)**
Never discussed having children together (0)	14 (7,22)
Not agreed to become pregnant (1)	24 (12,37)
Agreed to become pregnant (2)	156 (80,41)
Item 6 – Preconceptual preparations (not for respondents from the abortion centre) **(score)**	**Frequency (%)**
No preparations (0)	30 (18,29)
One preparation (1)	69 (42,07)
At least two preparations (2)	65 (39,63)

The alternative attitudinal scale – summing up the scores on items 2, 3 and 4 off the LMUP – has a Cronbachs alpha of 0,97 which is very high.

The table below shows that it pays off to use three different attitudinal items to measure pregnancy planning. We counted the number of attitudinal items on which women scored differently than two – the maximum score on a question indicating a perfectly planned situation. Fifty women or

25% of the respondents had a score of five or less on the attitudinal scale. In other words, these fifty women indicated on at least one of the attitudinal items that the pregnancy was not perfectly planned. 74% of these women indicated on each attitudinal item that the pregnancy was not perfectly planned. The other 26% choose on one or two of the items that the pregnancy was not perfectly planned.

<div align="center">Table 4. Counting items</div>

Indicating that the pregnancy was not perfectly planned…		Frequency (%)
…on one attitudinal item		8 (16)
…on two attitudinal items		5 (10)
…on three attitudinal items		37 (74)
	Total	50 (100)

The women who indicated on one or two items that their pregnancy was not perfectly planned were spread over the three different items. In other words, we could not select one item that could be used as a proxy measure for pregnancy planning.

Control variable. An important variable to control for is the pregnancy status at the moment of filling in the questionnaire: has the woman already given birth, was she still pregnant or has she chosen for abortion?

Choosing for an abortion versus continuing the pregnancy is strongly correlated with planning status: a woman who chooses for an abortion has on average a lower pregnancy planning, than a woman who continues her pregnancy. The variable 'choosing for an abortion' is also strongly correlated with our independent variables. There are more young, low educated and unmarried women in the group of women from the abortion centre. The average relationship length is shorter and women from the abortion centre live less often together with their partner. Knowing this, there are two (possibly complementary) explanations possible: these women are overrepresented in the abortion centre because they are more often unplanned pregnant and/or because they choose for an abortion more often when faced with an unplanned pregnancy. With the data at our disposition, we can not say which explanation of both or both is true. We will control for choosing for abortion through performing each analysis twice: once for all respondents and once for all respondents who continue their pregnancy.

Pregnant women have a higher planning status than women who already gave birth. This effect can probably be explained by non random sorting. The pregnant women in our sample were contacted at locations of prenatal care (at the gynaecologist, the pregnancy course…). Choosing for prenatal care is strongly correlated with pregnancy planning: literature shows that unplanned pregnant women take up less prenatal care (Kost, Landry, & Darroch, 1998, p. 85). The group of women in the maternity ward are more diverse in this regard: some of these women might have chosen for prenatal care, others might have not or might have done this very limited. Being pregnant (versus already given birth) was also correlated with age, one of our independent variables. There are proportionally more young women who were still pregnant at the moment they filled in the questionnaire[3]. When we control for the number of children a woman already had, before she became pregnant, the effect of age disappears. In other words, there are proportionally more first time mothers that are still pregnant. A logic explanation for this result is the fact that women with no earlier pregnancy experience will seek more prenatal care (especially for getting information) than women who already had a baby once. In our sample, 72 of the 73 women at the pregnancy course were pregnant for the first time. When we leave out the women from the course, the effect of number of children on pregnancy status disappears (results not shown).

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[3] We also checked for relationships between pregnancy status and relationship length, relationship status and educational level. These were not significant. We can do the analyses for these hypotheses without controlling for pregnancy status.

Hypotheses 1A-1E. Risk factors for unplanned pregnancies.

To test the different hypotheses, we performed regression analyses. The results of the analyses with all respondents are shown in table 5.

Young and older women have a lower pregnancy planning, than women in between these age groups. After controlling for relationship length (curvilinear) and living situation, the correlation disappears[4]. Apparently, relationship variables play a bigger role in predicting pregnancy planning than age does. Women in short and long relationships have a lower pregnancy planning, than women with an intermediate relationship length[5]. The plotted results are presented in the following graph.

Graph 1. Planning status and relationship length.

Planning status - scores on the attitudinal items

Relationship length in number of years
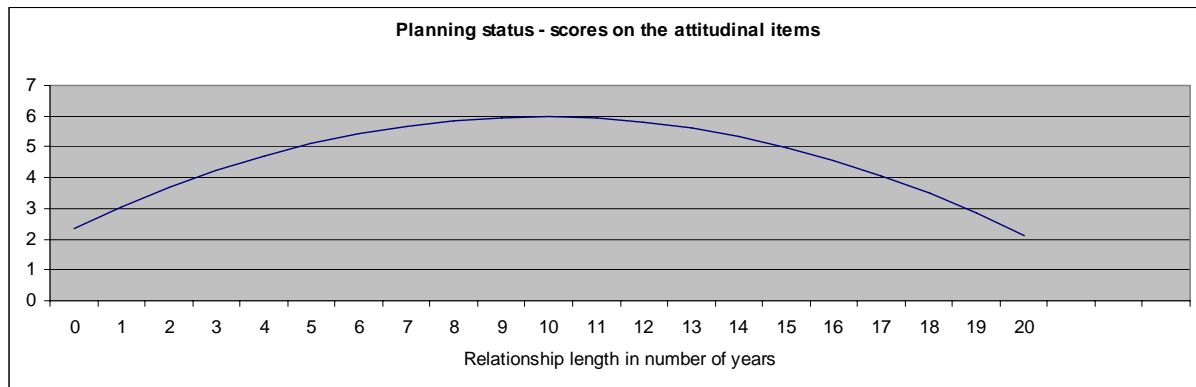
Women who lived separately from the father of the child have a significantly less planned pregnancy, than women who lived together with their partner. The relationship between marital status and pregnancy planning was insignificant. This result is not surprising, realising that cohabitation is these days regarded as a valuable alternative for marriage. To test hypothesis 1E, we split up our group of women into a group of women with a diploma of higher education and a group of women who have at maximum a high school diploma. As stated earlier, in our sample 73% or 140 women have done higher education. The other 27% or 51 women have a diploma of high school or less[6]. Our regression analysis shows that there is a strong significant relationship between educational level and pregnancy planning. Women with a diploma of higher education, have a more planned pregnancy than women with a lower educational level.

To control for abortion, we performed the above analyses again, but now only for the respondents who continued their pregnancy. These results are shown in table 6. The relationships between living together and relationship length and pregnancy planning turned insignificant. In other words, women with a short and long relationship and women who do not live together with their partner are mainly represented in the group of women who choose for an abortion. As already mentioned, this can mean two things: these women may face an unplanned pregnancy more often and/or they choose for an abortion more often when faced with an unplanned pregnancy. Since we are dealing with a non representative sample, it is not possible to decide which of both or both is the correct assertion. The effect of educational level remains significant. In other words, low educated

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[4] We checked for multicollinearity between all our independent variables, but the VIF-scores never exceeded 2. In other words, there is no risk for multicollinearity in our sample.

[5] The curvilinear relationship (women in short and long relationships have a lower pregnancy planning) between relationship length and pregnancy planning had a larger explanatory power than the linear relationship (the longer the relationship already lasted, the higher the pregnancy planning).

[6] Women younger than 21 years old were not included in this analysis, because they were not old enough to be able to have a diploma of higher education. In Belgium, you have to go to high school until you are 18 years old. It then takes at least three more years to finish an extra study.

women indicate to be more unplanned pregnant than high educated women. There are also proportionally more low educated women in the abortion centre, but the difference is rather small.

We can keep hypotheses 1B, 1D and 1E for the time being. Hypotheses 1A and 1C need to be rejected, based on our sample.

Table 5. Results of regression analysis. The effect of risk factors on pregnancy planning (all respondents)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0,05499	0,06037	0,01601	0,02147		0,01569
	(0,04)	(0,04)	(0,03)	(0,03)		(0,04)
Age²	-0,02842***	-0,01364***	0,00021	-0,00034		0,00213
	(0,01)	(0,01)	(0,01)	(0,005)		(0,006)
Relationship length		0,20407***	0,08636**	0,07286**		0,06659*
		(0,04)	(0,04)	(0,04)		(0,04)
Relationship length²		-0,03291***	-0,02398***	-0,02314***		-0,02340***
		(0,01)	(0,005)	(0,005)		(0,005)
Living situation – dummy variable			3,49677***	3,49789***		3,45426***
			(0,49)	(0,50)		(0,50)
Marital status – dummy variable				0,08636		0,10107
				(0,25)		(0,25)
Educational level – dummy variable					1,11690***	0,67274**
					(0,35)	(0,27)
Intercept	5,31071***	5,73533***	2,21391***	2,20104***	4,08163***	1,70004***
	(0,17)	(0,17)	(0,52)	(0,52)	(0,30)	(0,56)
N	189	189	189	186	185	182
R²	0,15	0,33	0,47	0,48	0,05	0,45

Notes: Standard errors in parentheses
*p<0,10; **p<0,05; ***p<0,01

Table 6. Results of regression analysis. The effect of risk factors on pregnancy planning (respondents who continue their pregnancy)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0,00461	-0,00898	-0,01149	-0,01239		-0,01458
	(0,02)	(0,02)	(0,02)	(0,02)		(0,02)
Age²	0,00064	0,00005	0,0009	0,00102		0,00320
	(0,004)	(0,004)	(0,005)	(0,005)		(0,005)
Relationship length		0,04992**	0,04819**	0,04740**		0,04255*
		(0,02)	(0,02)	(0,02)		(0,02)
Relationship length²		-0,00147	-0,00144	-0,00127		-0,00167
		(0,004)	(0,004)	(0,004)		(0,004)
Living situation – dummy variable			0,28645	0,29217		0,22462
			(0,59)	(0,60)		(0,59)
Marital status – dummy variable				0,02642		0,03388
				(0,15)		(0,15)
Educational level – dummy variable					0,45278***	0,43206**
					(0,17)	(0,18)
Intercept	5,72912***	5,74282***	5,45206***	5,42681***	5,38889***	5,13927***
	(0,09)	(0,09)	(0,61)	(0,63)	(0,15)	(0,63)
N	156	156	156	155	156	155
R²	0,0006	0,04	0,04	0,04	0,04	0,07

Notes: Standard errors in parentheses
*p<0,10; **p<0,05; ***p<0,01

Hypotheses 2A-2B. Risk factors on non use of contraception.

To know which women did not use birth control, when trying to avoid a pregnancy, we need to separate the perfectly planned pregnant women from the unplanned pregnant ones. Women who scored five or less on the attitudinal scale, will be labelled 'not perfectly planned pregnant'. The other women (with a maximum score of six on the attitudinal scale) will be labelled 'perfectly

planned pregnant'. In the first group we will have women who were ambivalent about becoming pregnant before they became pregnant and women who did not want to become pregnant at all. These two groups of women are different in many regards, but have in common that they are not perfectly capable of planning their own pregnancy. It is not known if women who become pregnant when feeling ambivalent about becoming pregnant terminate these pregnancies less or bear less unwanted children than women who were sure they wanted no children before their pregnancy (Frost, Singh & Finer, 2007, p. 97). We already saw that most respondents in our sample (74,62%) indicated to have a perfectly planned pregnancy. We performed a multinomial regression analysis to test our hypothesis.

Table 7. Results of multinomial logistic regression, Use of contraception for women with a less than perfectly planned pregnancy.

	Use of contraception	
	Not on every occasion/method failed	Always
Age	-0,0479	-0,0962
	(0,06)	(0,07)
Age²	0,0159*	0,0126
	(0,01)	(0,01)
Intercept	-1,3515***	-1,4068***
	(0,48)	(0,50)
N	12	11

Total N=50
Notes: Reference category for the equation is 'Never used birth control'
Standard errors in parentheses
*p<0,10; **p<0,05; ***p<0,01 (two tailed tests)

Young and older women did not use birth control less often when trying to avoid a pregnancy or doubting about becoming pregnant, than women in between these ages did. Based on these figures, we have to reject hypothesis 2A.

Educational level also has no effect on the use of contraception prior to a pregnancy. This is shown by the multinomial logistic regression, for the group of women with a less than perfectly planned pregnancy. Hypothesis 2B needs to be rejected.

Table 8. Results of multinomial logistic regression, Use of contraception for women with a less than perfectly planned pregnancy.

	Use of contraception	
	Not on every occasion/method failed	Never
Educational level – dummy variable	-0,8958	-0,4853
	(0,30)	(0,74)
Intercept	0,5594	1,1785
	(0,63)	(0,57)
N	12	27

Total N=50
Notes: Reference category for the equation is 'Always used birth control'
Standard errors in parentheses
* p<0,10; ** p<0,05; ***p<0,01 (two tailed tests)

Hypotheses 3A-3E. Risk factors for non communication with partner.

There is no significant effect of age on the influence from the partner, when we look at women with a less than perfectly planned pregnancy. Based on these figures, we have to reject hypothesis 3A.

Table 9. Results of multinomial logistic regression, Influence from the partner, for women with a less than perfectly planned pregnancy.

	Influence from the partner	
	Not agreed to become pregnant	Agreed to become pregnant
Age	-0,1148	0,0955
	(0,09)	(0,08)
Age²	-0,0158	-0,00246
	(0,01)	(0,01)
Intercept	0,7876*	-0,2784
	(0,45)	(0,56)
N	23	10

Total N= 47

Notes: Reference category for the equation is 'Never discussed having children together'
Standard errors in parentheses
* p<0,10; ** p<0,05; ***p<0,01 (two tailed tests)

Respondents with a short or long relationship have a higher probability to never have talked with their partners about having children together, in comparison with having decided to become pregnant together with the partner than women with an intermediate relationship length.

Table 10. Results of multinomial logistic regression, Influence from the partner, for respondents with a less then perfectly planned pregnancy.

	Influence from the partner	
	Not agreed to become pregnant	Agreed to become pregnant
Relationship length	0,1629	0,4104***
	(0,10)	(0,14)
Relationship length²	-0,0372**	-0,0583***
	(0,02)	(0,02)
Intercept	2,1362**	2,0366**
	(0,91)	(0,96)
N	10	23

Total N= 47

Notes: Reference category for the equation is 'Never discussed having children together'
Standard errors in parentheses
* p<0,10; ** p<0,05; ***p<0,01 (two tailed tests)

When we control for living together, our relationship becomes weaker, but does not disappear. There is no significant relationship between living together with the partner and the influence from the partner. The same happens when we control for age (curvilinear): the relationship between relationship length and influence from the partner does not change much when controlling for age. Being married finally also had no effect on the researched variable (results not shown). In other words, hypotheses 3A, 3C and 3D need to be rejected. Hypothesis 3B can be accepted, based on our sample.

When we take a look at women with a less than perfectly planned pregnancy, we see no difference between high educated and low educated women, when it comes to communication with the partner. Hypothesis 3E has to be rejected.

Table 11. Results of multinomial logistic regression, Influence from the partner, for respondents with a less then perfectly planned pregnancy.

	Influence from the partner	
	Not agreed to become pregnant	Agreed to become pregnant
Educational level – dummy variable	0,8220 (0,74)	0,7419 (0,87)
Intercept	0,1335 (0,52)	-0,5596 (0,63)
N	21	10

Total N= 43
Notes: Reference category for the equation is 'Never discussed having children together'
Standard errors in parentheses
* p<0,10; ** p<0,05; ***p<0,01 (two tailed tests)

Hypotheses 4A-4B. Risk factors for non intake of folic acid.

To test these hypotheses, we performed logistic regressions. We looked at the women who claimed their pregnancy was perfectly planned, since this group is particularly interesting for these analyses. Women who did not plan their pregnancy, probably did not use folic acid either[7].

We checked for a linear relationship (the older women get, the higher the possibility that they used folic acid) and for a curvilinear relationship (for younger and older women the possibility is lower that they took folic acid) between age and the intake of folic acid. Both relationships were insignificant (results not shown). When we leave out our control factor 'planning status', not much changes in our relationships. This is probably due to the small number of respondents with a very young or very old age[8].

As we can see from the table below, there is a significant relationship between educational level and the use of folic acid when we consider all respondents. This relationship disappears when we only look at respondents with a perfectly planned pregnancy.

Table 12. Results of logistic regression, Use of folic acid, for all respondents.

	Folic acid
	Used folic acid
Educational level – dummy variable	-0,8687** (0,42)
Intercept	-0,57 (0,42)
N	120

Total N= 156
Notes: Reference category for the equation is 'Not used folic acid'
Standard errors in parentheses
*p<0,10; **p<0,05; ***p<0,01 (two tailed tests)

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[7] There were nine women (or five percent of all the women who answered this question) who did take folic acid and who were not perfectly planned pregnant. Probably these women were not completely unplanned pregnant, but were ambivalent about becoming pregnant.
[8] The number of respondents is smaller for this particular question, because the women in the abortion centre did not receive the question on preparations prior to the pregnancy. Since the most extreme age-categories are found in that group of women, little age differentiation is left in the group of women who continue their pregnancies.

Table 13. Results of logistic regression, Use of folic acid, for respondents with a perfectly planned pregnancy.

	Folic acid
	Used folic acid
Educational level – dummy variable	-0,77 (0,47)
Intercept	-0,80** (0,40)
N	111

Total N= 139

Notes: Reference category for the equation is 'Not used folic acid'
         Standard errors in parentheses
         *p<0,10; **p<0,05; ***p<0,01 (two tailed tests)

Since the relationship becomes weaker after controlling for planning status, we recommend future research on the predictors of folic acid-use to do the same. Possibly previous studies found a correlation between the intake of folic acid and educational level, simply because there are more women with a low educational level who are unplanned pregnant. It is important to compare women who are planned pregnant with each other.

Discussion

Our data largely confirm the results found in the study of Edin and colleagues.

The strength of the intention to conceive is strongly affected by the relationship status. Women with a short or very long relationship and women who did not live together with their partner are more often unplanned pregnant in our sample. There is no difference in pregnancy planning among the women who continue their pregnancies with regard to relationship variables, which means that the women with a short or long relationship length and women who lived separately from their partner were overrepresented in our abortion sample. That can be an indication of the fact that these women choose for an abortion more often when faced with an unplanned pregnancy. As Bouchard (Bouchard, 2005, p. 632) mentions in her article, it seems that especially women for whom it is most difficult to raise an unexpected child become unplanned pregnant.

In our sample, age and marital status are no risk factors for unplanned pregnancy. The correlations between age and pregnancy planning in past research might be overestimated when there was no control for relationship status or relationship length. The fact that there is a stronger effect found from living together with the partner, than from being married can be a reflection of the fact that cohabitation is more and more a valuable alternative for marriage. Low educated women are also more often unplanned pregnant, but this effect is rather small. Relationship variables clearly have the strongest impact.

We do not see in our data that low educated women are less capable of planning or avoiding a pregnancy. They did not use birth control less often than other women. But this finding needs to be nuanced for two reasons. First, in our analyses we compared perfectly planned pregnant women with less than perfectly planned pregnant women. This last group consists of women who were doubting about becoming pregnant before they became pregnant, and women who were really unplanned pregnant. It is possible that low and high educated women are differently spread over these two subcategories and that different results will appear when controlling for this. Second, becoming pregnant while using birth control can also be linked with the investigated risk factors. These pregnancies are not always a consequence of an intrinsic failure of the birth control, but can be a consequence of a wrong usage of the method. For example, when a woman has been sick, the anti conception pill is less safe as a protection measure. A women can anticipate on that by using an extra method or abstaining from sex temporarily. When this does not happen, she can become pregnant even when always using birth control. It is possible that lower educated women are less aware of these risks. Lower educated women did not talk less with their partners prior to the

pregnancy, so communication seemed to be no problem among these relationships. Low educated women did not use folic acid less than higher educated women, when we controlled for pregnancy planning. Short, the theory that low educated have a lower sense of control and are less equipped to prevent pregnancy risks does not seem to be true, based on our data. The same is true for age: younger and older women are not less capable in avoiding or planning a pregnancy.

Communication with the partner was strongly affected by relationship length. Women in early relationships talked less with their partners about having children together, before they became pregnant. It is possible that these women are not really more often unplanned pregnant, but that their unexpected pregnancies 'feel' more often unplanned because they have not discussed their own and their partners' fertility plans yet. Women in longer relationships who are at a socially accepted point in their relationship to become pregnant, and who know how their partners feel about a possible pregnancy, might code an unexpected pregnancy as less unintended. Women in very long relationships indicated also that they did not talk with their partners about having children together. Probably these women where already passed their socially expected fertility age, making the coming of children not a topic anymore in the relationship. This is an interesting route to explore in further research.

With the remark on feelings from women, we open up a whole new discussion. Maybe a quantitative research is not capable of portraying these kind of feelings. This is also shown by the great number of inconsistencies in women's' behaviours and attitudes. For example, ten out of the 47 women with a less than perfectly planned pregnancy had decided together with their partner to become pregnant at that time. Even though, they made this agreement with their partner, these women kept having doubts and were not completely sure about becoming pregnant. Three of these women even chose to stop their pregnancy[9], which might indicate that the pregnancy was not wanted or well timed, in these women's eyes. Almost half of the women who were not perfectly planned pregnant (and who answered this question) used folic acid in the months before the pregnancy. So, even when doubting or being ambivalent, these women started with their preparations for pregnancy. To understand these women's feelings, quantitative research is far too limited. A qualitative, in-dept research will provide probably more answers.

Limitations of the study. This research is faced with three limitations. First of all, the sample was not representative of the larger population. It comprised on average too many higher-educated women. It is not clear how the selection has taken place, which is a consequence of our method of data collection. We do not have a clear sight on how it was done, because we did not do the data collection ourselves. The different locations we worked with did not allow us to spread our questionnaires ourselves (to protect the privacy of the patients). For research in the future other ways of data collection should be considered. A possibility is to work with Child and Family to contact respondents via them. In Belgium, all new mothers are contacted by this governmental institution.

A second limitation of the study is the small number of data lines. Because of the limited number of respondents, it is not possible to make hard, solid conclusions. The low number of respondents is partly caused by the outsourcing of the data collection. Doctors and nursing staff in Belgium are faced with a high workload, which makes it difficult for them to spend a lot of time on helping a research. Other causing factors are the small geographic area where data collection took place and the short time period of data collection.

The third limitation is the fact that the scale is not used completely for all respondents. For the respondents of the abortion centre we had to drop the question of the LMUP on preparations prior to the pregnancy.

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[9] Abortion centres in Belgium do not perform abortions for medical reasons – these abortions take place in the hospital. So we can be sure the women did not stop their pregnancy for medical reasons. Other reasons – besides pregnancy planning – are off course still possible (relationship problems…).

Conclusion

Researching the determinants of unplanned pregnancies remains an important research topic for scholarly researchers. A very important variable in this respect is communication with the partner. Respondents in short or very long relationships talked less with their partners about having children together (in the near or far future). These women also indicated that their pregnancy was more unplanned. This clearly indicates that becoming pregnant is still a decision taken by two persons, and when an unexpected pregnancy prevents people from taking this decision together people feel less prepared for their pregnancy.

Deciding together with the partner to become pregnant is nonetheless no guarantee for women to feel completely confident about becoming pregnant. Doubts can remain even when the decision has already been taken together with the partner. This clearly shows the benefit of analysing attitudinal variables and behaviour variables separately. A broader perspective on the concept 'planning' becomes possible. It is not only about how women feel about their pregnancy, their attitudes in other words, but also which objective behaviours they have portrayed in the time before their pregnancy. From this research, it becomes clear that behaviour and attitudes are not always in line with each other. To grasp women's planning status we need to know more than their attitudes.

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Attachment 1. London Measure of Unplanned Pregnancies (with scores) (Barrett, s.d.)

Below are some questions that ask about your circumstances and feelings around the time you became pregnant. Please think of your current (or most recent) pregnancy when answering the questions below.

1) In the month that I became pregnant......
(Please tick the statement which most applies to you):
G I/we were not using contraception **(2)**
G I/we were using contraception, but not on every occasion **(1)**
G I/we always used contraception, but knew that the method had failed (i.e. broke, moved, came off, came out, not worked etc) at least once **(1)**
G I/we always used contraception **(0)**

2) In terms of becoming a mother *(first time or again)*, I feel that my pregnancy happened at the......
(Please tick the statement which most applies to you):
G right time **(2)**
G ok, but not quite right time **(1)**
G wrong time **(0)**

3) Just before I became pregnant.......
(Please tick the statement which most applies to you):
G I intended to get pregnant **(2)**
G my intentions kept changing **(1)**
G I did not intend to get pregnant **(0)**

4) Just before I became pregnant....
(Please tick the statement which most applies to you)
G I wanted to have a baby **(2)**
G I had mixed feelings about having a baby **(1)**
G I did not want to have a baby **(0)**

In the next question, we ask about your partner - this might be (or have been) your husband, a partner you live with, a boyfriend, or someone you've had sex with once or twice.

5) Before I became pregnant....
(Please tick the statement which most applies to you)
G My partner and I had agreed that we would like me to be pregnant **(2)**
G My partner and I had discussed having children together, but hadn't agreed for me to get pregnant **(1)**
G We never discussed having children together **(0)**

6) <u>Before</u> you became pregnant, did you do anything to improve your health <u>in preparation for pregnancy</u>?

        (Please tick <u>all</u> that apply)

        G took folic acid

        G stopped or cut down smoking

        G stopped or cut down drinking alcohol

        G ate more healthily

        G sought medical/health advice

        G took some other action, please describe _____

                or

        G I did not do any of the above <u>before</u> my pregnancy **(0)**

Ticked off one item => (1)

Ticked off two or more items => (2)