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APPLICATION OF THE THEORY OF PLANNED BEHAVIOUR FOR EXPLAINING CHILDBEARING INTENTIONS – ASSESSMENT OF OPERATIONALIZATION AND MEASUREMENT[1]

Abstract

The article aims to evaluate how well the theory of planned behaviour (TPB; Ajzen, 1991) has been operationalized within the Generation and Gender Programme. In this project, the TPB has been applied as a theoretical framework for investigating childbearing intentions. According to the model, childbearing intentions are determined by attitudes towards having children, subjective norms concerning childbearing and perceived behavioural control. Scales to measure these variables have been introduced into the Generation and Gender Survey (GGS) that has been administered to thousands of respondents in Europe – almost 7 thousand individuals responded to the questions on childbearing intentions in Poland. The analyses conducted on the Polish data indicate that the reliability of the scales to measure attitudes, norms and perceived behavioural control is high. Nevertheless, several significant problems with their validity have been identified. In particular, the scale of the perceived behavioural control does not provide valid results and should not be used to explain childbearing intentions.

Keywords: childbearing intentions, theory of planned behaviour, reliability, validity

1. Introduction

This article aims to evaluate the operationalization of the theory of planned behaviour (TPB, Ajzen, 1991), which was carried out as part of the study "Generations, families and gender – GGS-PL" (Kotowska & Jóźwiak, 2011). In this study the theory of planned behaviour was used to explain the difference in childbearing intentions of Polish men and women.

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Both in Poland and other developed countries, fewer children are born each year, which leads to an ageing population. To take effective action against this phenomenon, it is necessary to better understand the reasons why young people decide to have smaller families or give up having offspring at all. Therefore, social researchers are showing increasing interest in the process of shaping parental intentions and the factors that determine their implementation (e.g., Billari, Philipov, & Testa, 2009; Dommermuth, Klobas, & Lappegård, 2011; Jokela, Alvergne, Pollet, & Lummaa, 2011; Liefbroer, 2009; Miller, Rodgers, & Pasta, 2010; Philipov, 2009; Roberts, Metcalfe, Jack, & Tough, 2011; Sobotka & Testa, 2008; Spéder & Kapitány, 2009). They also increasingly refer in their research to psychological models of intentions and decision making. In recent years, the most frequently used model is the theory of planned behaviour of Icek Ajzen (1991). It is now one of the theoretical bases of the "Generations and Gender" project (Vikat et al., 2007), whose main objective is to collect the data needed for a better understanding of demographic change in an ageing Europe. Within the Polish part of this project "Generations, families and gender – GGS-PL" (Kotowska & Jóźwiak, 2011) a very extensive and detailed survey was conducted, covering 20 thousand respondents. Almost half of this sample were people of reproductive age and these people were asked a series of questions about their childbearing intentions (Mynarska, 2011). The survey also included questions about the variables that, according to the theory of planned behaviour, d,etermine the intention to have children. In this paper, an attempt will be made to assess how well these variables have been operationalized and measured.

2. The Theory of Planned Behaviour

2.1 The Theory of Reasoned Action and Planned Behaviour

Icek Ajzen's *theory of planned behaviour* (Ajzen, 1985, 1991) was created as an extension of the *theory of reasoned action,* developed by Ajzen together with Martin Fishbein (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The concept of intention is central to both these models. Intentions include all the motivational components of human behaviours and are "indicators of how hard people are willing to try to, of how much of an effort they are planning to exert, in order to perform the behaviour" (Ajzen, 1991, p. 181). The main assumption of both theoretical models is that unless there are any unforeseen circumstances, people will behave according to the formulated intentions (Ajzen, 1985; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2010). Naturally, intentions are not constant over time and can be modified as a result of any change in one of the three groups of factors influencing them. These factors, as postulated by the theory and described below, are: attitudes towards behaviour, subjective norms and perceived control over behaviour.

Attitudes. Each intention is formed primarily by attitudes that derive from the individual's beliefs about the expected effects of a given behaviour (the expectancy-value model). The higher the subjective value of the expected outcome of a given behaviour, the more positive the attitude towards it, and, as a result, the stronger the intention to implement it.

Subjective norms. The second group of factors influencing intentions are subjective norms. According to the theory of planned behaviour, these norms are closely related to social pressure to implement or refrain from carrying out a given behaviour. Subjective norms are created based on personal beliefs that certain behaviour will or will not be approved by "significant others". As "significant others", an individual can consider

their parents, partner, friends, yet also society as a whole. Furthermore, some of the subjective norms can be internalized and independent of the presence of any reference persons. Such norms are defined by Ajzen as moral norms (Ajzen, 1991).

A perceived behavioural control. The last group of intent-determining variables refers to the resources and capabilities available to the individual, which are necessary for the performance of a given behaviour. In the early version of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), the authors only considered *actual behavioural control*: whether an individual has adequate resources, such as time, material resources, skills, or the cooperation of others, determines the possibility of achieving a given intention. Ajzen (1991) noted, however, that subjective evaluation of resources and capabilities (*perceived behavioural control*) plays a key role in the process of shaping intentions and can support or inhibit their realization.

The attitudes, subjective norms and the perceived behavioural control are based on the individual's beliefs. These, however, can be shaped by numerous variables, treated in the discussed theoretical model as external variables (external to the axial variables of the model): socio-demographic characteristics, personality, previous experiences of the individual, their knowledge, etc. (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2010). The chart below schematically presents the relationships between the key variables in the planned behaviour theory.

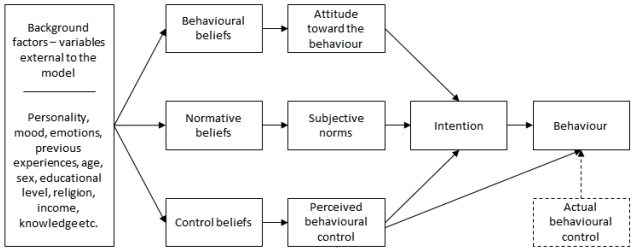

Figure 1. Schematic presentation of the theory of planned behaviour (based on Fishbein & Ajzen, 2010, p. 22).

As it results from the above scheme, intentions are shaped by the direct influence of the three aforementioned groups of variables: attitudes towards the behaviour, subjective norms and perceived behavioural control. All other variables influence intentions indirectly. Therefore, a good (valid and reliable) measurement of attitudes, subjective norms and perceived behavioural control is a key element in empirical research referring to the theory of planned behaviour.

2.2 Measurement of the Variables Postulated in the Theory of Planned Behaviour

A significant advantage of the theory of planned behaviour is that the proponents of this theoretical approach have published many guidelines for measuring intentions,

attitudes, norms and perceived behavioural control. Providing a complete list of recommendations is well beyond the scope of this study, but the main guidelines of Fishbein and Ajzen and sample questions will be presented. All examples are taken from Ajzen and Fishbein (1980) and Fishbein and Ajzen (2010).

Intentions. Questions about intent should assess how likely it is that the subject will engage in a particular activity. It is important to clearly define in the question what the intention (purpose, behaviour) is about and what is the time perspective and context for the implementation of this intention. The scale of the answers should reflect the degree of involvement of the respondent in the implementation of this intention, for example: *I intend to donate blood during an event organized at the university next week. (definitely no 1 – 2 – 3 – 4 – 5 – 6 – 7 definitely yes)*

Attitudes. In measuring attitudes, the questions must be formulated with regard to the specific behaviour of interest us and that they allow to determine the degree to which a given attitude is positive or negative (bipolarity of assessments). The semantic differential method is useful here. The respondent may be asked to rate the extent to which a given behaviour is good–bad, desirable–undesirable, favourable–unfavourable, and so forth (Fishbein & Ajzen, 2010). There are also possible methods referring to the person's beliefs about the consequences of a given behaviour. The following items are an example of this: *The use of condoms can have a negative effect on the relationship: The use of condoms is uncomfortable. (I strongly disagree 1 – 2 – 3 – 4 – 5 I strongly agree).*

Subjective norms. In the case of measurement of subjective norms, respondents should be asked whether the people who are important to them approve or condemn the behaviour. The questions can be formulated in a general way, for example: *Most people who are important to me think that: I should 1 – 2 – 3 – 4 –5 –* 6 – 7 *I should not go on holiday this year.* It is also possible to ask questions about specific people, for example: *My husband believes that: I should 1 – 2 – 3 – 4 – 5 –* 6 – 7 *I should not have a child in the next 12 months.* The authors draw attention to the fact that in the latter case it should be empirically established whether the respondent really relies on the opinion of certain people. This can be done, for example, by asking open-ended questions in the first step, for the respondent to name five people who could influence his or her decision about the behaviour. Then questions are asked with regard to these people.

Perceived behavioural control. The aim of the questions about the perceived behavioural control is to determine the extent to which the respondent feels that he or she has the appropriate resources and capabilities to implement the intention. Questions may concern the extent to which the respondent considers a given behaviour to be difficult or easy, under their control, or dependent only on their will, for example: *Quitting smoking in the next six months is for me: very difficult 1 – 2 – 3 – 4 – 5 – 6 – 7 very easy. I have full control over whether I can quit smoking in the next six months: definitely no 1 – 2 – 3 – 4 – 5 – 6 – 7 definitely yes.*

In conclusion, in the opinion of the proponents of the theory of planned behaviour, questions about intentions and their determinants must be asked in a precise manner, with regard to a specific behaviour, planned in a specific context and time perspective. It is also worth noting that for each question, at least a five-point (and usually seven-point) response scale is suggested.

2.3 The Theory of Planned Behaviour in Studies on Childbearing Intentions

The theory of planned behaviour was used in research to explain a very wide range of human behaviour such as quitting smoking, using contraception, voting in elections, using drugs, changing jobs, using new teaching methods, taking up studies or even using a solarium (a rich overview of this research can be found in publications, for example: Armitage & Conner, 2001; Notani, 1998). The interest in the theory of planned behaviour has grown exponentially over the past decade among demographers and sociologists, who are increasingly using it to explain childbearing intentions. The studies look at the determinants of these intentions (Billari et al., 2009; Dommermuth et al., 2011; Klobas, 2010), their variability over time (Iacovou & Tavares, 2011) and factors affecting their realization (Philipov, 2009; Spéder & Kapitány, 2009). The theory of planned behaviour is also referred to by authors dealing with unplanned pregnancies (Lifflander, Gaydos, & Hogue, 2007). At the beginning of this century, Icek Ajzen's theoretical model was operationalized under the "Generations and Gender Programme" (Vikat et al., 2007). The research of this programme is carried out in 19 countries – mainly in Europe, but also in Australia and Japan (more detailed information on the project and available data can be found on the website: http://www.ggp-i.org/). In Poland, the research of the above project was carried out by the Institute of Statistics and Demography of the Warsaw School of Economics in cooperation with the Central Statistical Office. The survey was conducted using the face-to-face interviewing method at the turn of 2010 and 2011 and covered 20 thousand respondents (Kotowska & Jóźwiak, 2011). One of the sections of the survey was entirely about procreative behaviour and intentions. According to the assumptions of the theory of planned behaviour, respondents were asked about their intention to have a child within the next three years. Additionally, the survey included questions about the remaining variables postulated by Ajzen's theory. These questions were supposed to create scales for measuring attitudes, subjective norms and perceived behavioural control, connected with having offspring. These scales will be presented later in the article, and then their psychometric properties will be assessed.

3. Method

3.1 Research Sample

The survey "Generations, families and gender – GGS-PL", from which the analysed data come, covered respondents aged 18–79 years. For obvious reasons, questions about childbearing intentions were addressed only to people of reproductive age: women aged 49 or less and men whose partner was under 50. For the presented analyses, the research sample was limited to people under the age of 40, because among older respondents only 4% declared intentions to have a child. Table 1 below shows the basic characteristics of the sample, divided by sex. The analyses included all persons who answered the question about childbearing intentions: there were 6,685 persons in total. In the case of subsequent analyses, the number of cases taken into account may be smaller due to the missing data on attitudes, norms or perceived behavioural control.

Table 1
Sample characteristics

		Men n = 2,943	Women n = 3,742
Age	Under 20	7,3%	7,7%
	20–29 years	43,7%	41,7%
	30–39 years	48,9%	50,6%
Children	Childless	55,3%	38,6%
	One child	22,8%	26,7%
	Two or more children	21,9%	34,7%
Marital status	Single	51,4%	38,7%
	Married	45,5%	54,0%
	Widowed, divorced or in separation	3,1%	7,3%
Place of residence	Village	31,5%	31,8%
	Town/City	68,5%	68,2%
Education	Junior high school or lower	11,5%	10,1%
	Basic vocational	23,7%	16,1%
	Vocational secondary	21,2%	17,4%
	Secondary and post-secondary	17,6%	22,7%
	Bachelor's degree or higher	26,0%	33,6%

3.2 Variables

The questions about childbearing intentions used in the Polish research are an exact translation of the questions designed by the international consortium responsible for the international "Generations and Gender Programme". During the preparation of the translation, only slight linguistic corrections were allowed, which did not change the meaning of the original questions. The detailed questions of the survey, designed to measure the variables, as postulated in the Ajzen's theoretical model, are presented in Table 2.

Table 2

Questions about intentions, attitudes, norms and subjective control, GGS-PL questionnaire

Questions	Coding of responses
Intentions	
Do you intend to have a child (or another child) during the next 3 years? Please do not include adoption plans.	Definitely no – 1 Probably no – 2 Probably yes – 3 Definitely yes – 4
Attitudes	
Suppose that during the next 3 years you were to have a (another) child . What effect would that have on various aspects of your life. Would it be better or worse for: a. your possibility to do what you want b. your employment opportunities c. your financial situation d. your sexual life e. what people around you think about you f. the joy and satisfaction that you get from life g. the closeness between you and your spouse/partner h. your partner's employment opportunities i. the care and security you may get in old age j. certainty in your life k. the closeness between you and your parents.	Much worse – 1 Worse – 2 Neither better nor worse – 3 Better – 4 Much better – 5 Not applicable – no data
Subjective norms	
Please state to what extent you agree or disagree with the following statements a. most of your friends think you should have a (another) child within the next 3 years b. Your parents think you should have a (another) child within the next 3 years c. Most of your relatives think you should have a (another) child within the next 3 years	Strongly disagree – 1 Disagree – 2 Neither agree nor disagree – 3 Agree – 4 Strongly agree – 5 Not applicable – no data
Perceived behavioural control	
To what extent your decision whether to have or not to have a (another) child during the next 3 years depends on the following factors: a. your financial situation b. your work c. your housing conditions d. your health e. you having a suitable partner f. your spouse's/partner's work g. your spouse's/partner's health h. availability of childcare h. your opportunity to take parental leave	Not at all – 1 A little – 2 Quite a lot – 3 A great deal – 4 Not applicable – no data available

3.3. Analyses

In order to assess how well the variables on childbearing intentions have been operationalized and measured, the following analyses were carried out:

1) assessment of measurement validity by analysing the content of the questions in relation to the theoretical model;

2) assessment of measurement reliability by analysing the internal consistency of the scales (analyses for women and men separately);

3) assessment of validity by examining the relationship between childbearing intentions and attitudes, subjective norms and perceived behavioural control postulated in the theoretical model.

4. Results

4.1 Assessment of Validity – The Analysis of the Content of Questions

First of all, one should consider to what extent the content of the questions reflects the measured variable as it is postulated in the theoretical model. This assessment is necessary to decide whether it is justified to create scales based on the questions about attitudes, norms and behavioural control.

Childbearing intentions. In accordance with the theory of planned behaviour, the aim (childbearing) and time frame (next three years) for achieving this intention, were specified in the question. Ajzen and Fishbein (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2010) additionally assert that there is a need of measuring the level of certainty of each formulated intention. A four-level scale allows to perform this type of measurement in the GGS survey (*definitely not*, *probably not*, *probably yes*, *definitely yes*). Nonetheless, the scale is shorter than recommended by the proponents of the theoretical model and that only one question is devoted to the measurement of intentions. This means that the variable which is key in the theoretical model is not measured as a continuous variable – the response scale is an ordinal scale.

Attitudes. According to the theory, the questions on attitudes are formulated in respect to the specific behaviour: having a child within the next three years. Survey participants assessed the expected impact of childbearing on different aspects of their lives. The response format (from *definitely worse* to *definitely better*) allows to distinctly determine whether the respondents expect a positive or negative outcome (bipolarity of assessment). However, it is problematic that not all of the questions concern all participants of the survey. For example, respondents were asked how a child would affect their relationship with their parents. This question could not be answered by respondents whose parents are deceased. Similarly, answering questions about the impact of childbearing on the relationship with a spouse/partner, or on the situation of a spouse/partner on labour market may be difficult or even impossible for people who are not in a relationship (they could only answer hypothetically, which they were not asked to do in the instruction).

Subjective norms. In questions concerning a subjective sense of social pressure, respondents were asked whether the fact of having a child (within the next three years) would be consistent with the expectations of their friends, parents and relatives. A five-point answering scale to each question allows calculating the total level of pressure felt. Unfortu-

nately, it is not possible to establish whether the respondents find the opinion of the people listed in the questions important. Moreover, some respondents were not able to answer all questions (not all respondents had living parents).

Perceived behavioural control. To measure perceived behavioural control, the authors of the survey asked a series of questions on how different resources and possibilities are relevant for procreative intentions. Unfortunately, the way the questions were formulated made it impossible to interpret the answers in the categories postulated by the theory of planned behaviour. Let us consider the first question: "To what extent your decision whether to have or not to have a (another) child or to resign from having a child within during the next 3 years depends on the following factors: Your financial situation". If a respondent answers this question by saying *It does not depend on it at all*, what does it mean? There are many possible interpretations: (1) a survey participant has relevant financial resources but they do not intend to have a child, (2) they do not have relevant financial resources but do not intend to have a child for completely different reasons than lack of financial resources, (3) they do not have relevant resources but still intend to have a child or (4) they have relevant resources and plan to have a child, but this aspect was not important in the decision. Clearly, the interpretation of an answer to such question may vary and one is not able to clearly assess whether the answer *it does not depend on it at all* indicates a low or high sense of control over behaviour. The same problem occurs in all items of this scale. As a result, although the questions seem to be very similar and coherent, they do not make it possible to clearly assess whether a respondent believes that he or she have the resources and prospects sufficient to have a child. The survey participants only determine how many and what factors their procreative decision depend on. They do not determine to what extent they control those factors.

In conclusion, the measurement of intentions, attitudes and subjective norms is overall consistent with the theoretical model However, there are significant problems related to how the scales are constructed (there is only one question to measure intentions, some questions are not applicable to all respondents, lack of empirical identification of "significant others" in questions on norms). However, one might consider the content of the questions as satisfactory. Unfortunately, the questions concerning perceived behavioural control were formulated in a completely incorrect way making it impossible to interpret the respondent's answers according to the theoretical model.

4.2 Measurement Reliability – Internal Consistency of Scales

The psychometric properties of the scales of attitudes, subjective norms and perceived behavioural control are presented in Tables 3–5 below. For each scale, the Cronbach's alpha internal consistency coefficient and the coefficients of discriminant power (corrected item-total correlations) for the questions were computed. The analyses were conducted separately for men and women.

Attitudes. As can be seen from the data presented in Table 3, the questions referring to attitudes created a consistent scale characterized by high reliability ($\alpha = .800$ for women and $\alpha = .804$ for men). The properties of the whole scale as well as of the individual questions are very similar in the sample of women and men. All questions are characterized by a satisfactory item-total correlations (all coefficients are statistically significant and range between .32–.62). One noteworthy aspect is the high level of missing data – almost

30% of cases were excluded from the analysis. This is due to the very large missing data in the questions that concerned the spouse/partner of the subject. These questions did not apply to about 20% of the respondents. Significant non-response was also reported for questions b) (5.5%) and d) (8%).

Table 3

Psychometric characteristics of the scale of attitudes towards having children in the next three years

	Women	Men
Item-total correlations: Suppose that during the next 3 years you were to have a (another) child. What effect would that have on various aspects of your life. Would it be better or worse for:		
a) your possibility to do what you want	.405	.393
b) your employment opportunities	.407	.461
c) your financial situation	.433	.460
d) your sexual life	.362	.401
e) what people around you think about you	.396	.413
f) the joy and satisfaction that you get from life	.638	.629
g) the closeness between you and your spouse/partner	.575	.559
h) your partner's employment opportunities	.348	.318
i) the care and security you may get in old age	.461	.466
j) certainty in your life	.552	.557
k) the closeness between you and your parents.	.456	.461
Number of valid observations	n = 2,640 (70.6%)	n = 2,075 (70.5%)
Number of excluded observations (missing data)	n = 1,102 (29.4%)	n = 868 (29.5%)
Mean of the scale	31.47	31.98
Standard deviation of the scale	4.35	4.46
Cronbach's alpha	.800	.804

Subjective norms. Questions on subjectively perceived norms have also created a consistent scale, characterised by very high reliability (α = .928 for women and α = .937 for men). The scale is short but very homogeneous: the item-total correlation of the questions ranges from .81 to .91. Missing data, although they do exist, do not pose as much of a problem as for the previous scale (on attitudes). The highest number of missing data was recorded in the case of question b) – about the opinions of the parents of the respondent. As with the previous scale, the psychometric properties are similar for men and women.

Table 4

Psychometric characteristics of the scale of subjective norms regarding having children in the next three years

	Women	Men
Item-total correlations:		
Please state to what extent you agree or disagree with the following statements		
a) Most of your friends think you should have a (another) child within the next 3 years	.812	.821
b) Your parents think you should have a (another) child within the next 3 years	.850	.883
c) Most of your relatives think you should have a (another) child within the next 3 years	.896	.907
Number of valid observations	n = 3,484 (93.1%)	n = 2,762 (93.8%)
Number of excluded observations (missing data)	n = 258 (6.9%)	n = 181 (6.2%)
Mean of the scale	7.59	7.68
Standard deviation of the scale	3.29	3.21
Cronbach's alpha	.928	.937

Perceived behavioural control. Although the analysis of the content of the questions (presented in the previous chapter) has shown that items on perceived behavioural control are formulated incorrectly, they represent a surprisingly homogeneous scale. The item-total correlation for individual questions is high (from .59 to .74), and the overall coefficient of internal consistency of the scale is above .90 in both the female and male samples. Also in this group of questions, missing data are a significant problem. Again, the biggest problem was caused by questions f and g, about the spouse/partner of the surveyed person, on which a significant number of people, who were not in a relationship, did not answer. Missing data in these questions reached 16–18%. Also, item b (concerning the job of the respondent) was not answered by a meaningful share of survey participants (11% of the whole sample).

Table 5
Psychometric characteristics of the scale of a subjective sense of control over behaviour

	Women	Men
Item-total correlations: To what extent your decision whether to have or not to have a (another) child during the next 3 years depends on the following factors:		
a) your financial situation	.694	.728
b) your work	.676	.739
c) your housing conditions	.648	.686
d) your health	.592	.686
e) you having a suitable partner	.613	.619
f) your spouse's/partner's work	.741	.680
g) your spouse's/partner's health	.710	.697
h) availability of childcare	.702	.698
i) your opportunity to take parental leave	.662	.648
Number of valid observations	n = 2,609	n = 2,081
	(69.7%)	(70.7%)
Number of excluded observations (missing data)	n = 1,133	n = 862
	(30.3%)	(29.3%)
Mean of the scale	21.59	21.30
Standard deviation of the scale	7.76	7.69
Cronbach's alpha	.901	.908

To sum up, all three scales are characterized by high or very high reliability (internal consistency, assessed using the Cronbach's alpha coefficient), and the psychometric properties of individual questions as well as the scales are similar in the sample of women and men. In the case of scales concerning attitudes and perceived behavioural control, missing data constitute a serious problems, as some questions do not apply to all respondents.

4.3 Assessment of Validity – The Relationship of Attitudes, Norms and Perceived Behavioural Control with Intentions

According to the operationalized model of the theory of planned behaviour, scales of attitudes, subjective norms and perceived behavioural control should show high positive correlation with declared intentions. To verify this, the total scores for each of the three scales were calculated for each respondent. The score consists of the sum of answers to the individual questions. Scales were coded in a way that a higher score on the attitudes scale indicates more positive attitude towards having children, and a higher score on the scale of norms indicates more positive opinions of the respondent's friends and relative on respondent having children (high level of felt pressure; see: Table 2). In the case of the scale which was intended by the authors to measure perceived behavioural control, a high

score means that in the opinion of the respondent, their decision on having or not having a child within the next three years depends on a large number of factors.

The childbearing intention was measured using a four-point ordinal scale (see: Table 6), hence Kendall's rank correlation coefficients were computed to measure strength and direction of the relations between the variables.

Table 6

Distribution of answers to questions about the intention to have a child in the next three years

Do you intend to have a child (or another child) in the next three years?	Women $n = 3,742$	Men $n = 2,943$
Definitely not	1,572 (42%)	1,026 (34.9%)
Probably not	967 (25.8%)	859 (29.2%)
Probably yes	727 (19.4%)	680 (23.1%)
Definitely yes	476 (12.7%)	378 (12.8%)

Table 7

Correlation coefficients between the intention to have children within the period of the next three years and the total scores of the scales of attitudes, norms and perceived behavioural control

Variable X	Variable Y	Nonparametric correlation coefficients (Kendall's Tau)	
		Women	Men
The intention to have a child within the next three years	Scale: Attitudes	.43 ($n = 2,640$)	.37 ($n = 2,075$)
	Scale: Norms	.45 ($n = 3,484$)	.43 ($n = 2,762$)
	Scale: Perceived control	−.04 ($n = 2,609$)	−.07 ($n = 2,081$)

All correlations are significant at $p < .01$

All correlation coefficients proved to be statically significant, which is not surprising for such large samples. The scale of attitudes and subjective norms correlates with intentions consistently with expectations: the more positive the attitudes of the respondents and the more positive the attitude of their close ones – the more positive the intentions to have offspring. These correlations are moderate for both women and men, although it should be noted that the lowest correlation occurs between attitudes and intentions in the male sample (Tau = .37). In the case of the perceived behavioural control scale, the correlation is negative. This means that the more factors the respondents found important for their decision to have a child, the more negative intentions they expressed (i.e., they did not intend to have children in the next three years). Nevertheless, although correlation coefficients are statistically significant, their size is close to zero.

Therefore, it can be concluded that the results of the analyses confirm the relations between intentions and attitudes and subjective norms postulated in the theoretical model. Although the correlations are not very high, they are in favour of the validity of their measurement. However, the same cannot be stated concerning the questions that were intended by the authors of the questionnaire to capture perceived behavioural control.

5. Summary and Discussion

Research on childbearing intentions is an important part of the search for answers to the question of why fewer and fewer children are being born. However, this research requires data that will provide reliable and valid information on the intentions and their determinants. An attempt to collect such data was made under the "Generations and Gender Programme", but it was not fully successful. One of the important objectives of the GGP was to measure variables relevant to childbearing intentions, based on the theory of planned behaviour (Ajzen, 1991). The analyses presented here clearly reveal many shortcomings in how these variables were operationalized and how the scales were constructed to measure them. Although, in general, the operationalization of intentions, attitudes and subjective norms was consistent with the theoretical model, and the total scores indicative of attitudes and subjective norms correlate positively with parental intentions, it is impossible to fully verify Ajzen's theoretical model. This is prevented by the very low validity of the perceived behavioural control scale. As a result, it is impossible to build a structural model that would cover all the components of the theory of planned behaviour in an attempt to predict childbearing intentions, which the "Generations and Gender Programme" was originally designed to do.

Of course, it is possible to use the constructed scales for some partial analyses. For example, it would be possible to examine the impact of attitudes or subjective norms on childbearing intentions, as well as on final reproductive decisions (when panel data is available). However, even in these analyses, one should keep in mind the limitations shown here. First of all, the validity of the proposed scales is problematic in case of people who are not in a relationship. It might be reasonable to exclude the questions concerning the partner, but this might negatively impact reliability of the scale. Alternatively, analyses should be limited to people in a relationship.

From a psychometric point of view, it is noteworthy that although all the three analysed scales are internally consistent, their validity is not satisfactory. This is particularly visible in the case of scale to measure perceived behavioural control. Yet, other scales (of attitudes and norms) also do have some shortcomings (e.g., the questions do not apply to all respondents, there is no empirical identification of "significant others" in the scale of norms).

It should be noted that the main problems related to validity of the scales were detected without any sophisticated statistical analyses. The very analysis of the theoretical model and the systematic reference to the content of the questionnaire items made it possible to identify the most important problems of the scales. These problems were confirmed by later empirical analyses (missing data, only a moderate correlation between attitudes and subjective norms, and childbearing intentions, close to zero correlation between the scale designed to measured perceived control and childbearing intentions).

The presented analyses show how important it is to have a very critical approach to the questions and scales as they get constructed. In their publication Dommermuth and col-

leagues (2011) used the data from the "Generations and Gender Programme", the scales of attitudes, norms and perceived control, to explain childbearing intentions in Norway. They verified the correctness of measurement of the analysed variables using factor analysis (checking if they obtain three independent dimensions) and calculated Cronbach's alpha coefficients for the scales. Satisfied with the results of these analyses, the authors computed several regression models in which the role of the perceived behavioural control turned out to be problematic and not in line with theoretical expectations. In the summary and discussion of their results, looking for an explanation for the result that was inconsistent with the theoretical assumptions, do the authors notice: "One possible explanation is that perceived behavioural control is measured imperfectly in the GGS. The items measured the perceived importance of different constraints to the respondent, but do not directly measure the extent to which the individual feels they have control over those constraints" (Dommermuth et al., 2011, p. 53). In such a situation, the question of whether it was at all reasonable to carry out all the analyses seems to be relevant. Should not one start with a critical analysis of the questions before estimating the models? Introduction of a variable that is not accurately operationalized and measured puts into question all the results obtained, and the weak association between perceived behavioural control and intentions is a spurious result.

In any psychological research, assessing the validity of the questions or scales should be the first step. Even standard questionnaires with approved psychometric properties should be verified for their usefulness in individual studies and to test specific research hypotheses. If there is a lack of certainty that the data provide reliable but also – and most of all – valid information on variables in question, even the most advanced and sophisticated statistical analyses will lead researcher astray.

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