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Risk taking propensity in pregnancy — Longitudinal study

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ABSTRACT

Pregnancy induces many physiological and psychological changes associated with a suite of new behaviours developing to increase the chance for an offspring survival. This study aimed to investigate whether risk-taking propensity changes during pregnancy. Eighty one healthy, pregnant women (age M = 29.63, SD = 3.79) participated in the longitudinal study. Participants completed DOSPERT questionnaire in each pregnancy trimester. Ratings of risk-taking, risk perception and expected benefits varied among risk domains with social risk perceived as the most risky and the most beneficial across all three trimesters. The willingness to engage in risk-taking did not change during pregnancy, but the risk perception and perceived benefits changed in some risk domains. Risk perception was the highest and the expected benefits were the lowest in the first, the most vulnerable, pregnancy trimester. This may confirm the hypothesis that the risk-taking is a complex construct which may be influenced by cognitive and physiological changes related to pregnancy.

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1. Introduction

Pregnancy involves many physiological and psychological changes associated with development of a suite of new behaviours (Neumann, 2003; Russell, Douglas, & Ingram, 2001). Many of those behavioural adjustments are adaptive and serve to protect a mother and a fetus. For instance, successful pregnancy requires down-regulation of immune defences, potentially leaving a mother and a fetus more vulnerable to pathogens (Fessler, 2002). Those physiological changes are followed by increase in prophylactic behaviours, compensating for increased immunovulnerability (Fessler, 2002; Flaxman & Sherman, 2000; Żelaźniewicz & Pawłowski, 2015). As a consequence women exhibit higher disgust sensitivity and the heightened attraction toward the ingroup and negativity toward the outgroup during pregnancy, when both a woman and a developing fetus are vulnerable to infections (Navarrete, Fessler, & Eng, 2007).

Physiological and cognitive changes during pregnancy may alter not only prophylactic attitudes, but also risk-taking propensity in order to protect a mother, burdened with developing pregnancy, from some unexpected and difficult to estimate cost. There is evidence that pregnancy may be associated with heightened sensitivity to danger and increased ability to encode emotional faces signalling threat and anxiety (Pearson, Lightman, & Evans, 2009; Roos, Robertson, Lochner, Vythilingum, & Stein, 2011; Roos et al., 2012). Though, risk-taking is an important form of human behaviour, shaped by natural and sexual selection, it is defined in various ways. Most definitions refer to the manner in which an individual perceives and resolves decisions involving uncertainty, anticipating and evaluating potential consequences (rewards and losses) of pursuing an activity (Byrnes, Miller, & Schafer, 1999; Blais & Weber, 2006). Those definitions imply that a wide range of behaviours qualify as instances of risk-taking, including behaviours in financial, health, social and interpersonal areas (e.g. smoking, having unprotected sex, telling an inappropriate joke).

Individuals differ significantly in risk-taking propensity, depending on sex, age, physiological and environmental conditions. Women, compared to men, are generally less prone to take risks of different kind (e.g. in extreme sports, driving too fast, binge drinking, having unprotected sex, hazard and financial decisions) (Byrnes et al., 1999; Campbell, 1999; Faff, Mulino, & Chai, 2008). Also, risky situations are more stressful for women comparing to men (Kerr & Vlaminkx, 1997). From an adaptive perspective women, compared to men, are expected to be less willing to take risk, as they not only gain less fitness from risky behaviours, but also may bear a greater cost (Byrnes et al., 1999). Maternal death imperils her offspring to a greater extent than father's loss of life (Sear & Mace, 2008), thus women with children should experience greater caution when exposed to an equivalent degree of physical risk. This concerns not only physical risk, as for instance, a mother's loss of resources may likewise endanger her young, inclining women to be more reluctant to risk their resources (Campbell, 1999).

An individual's risk-taking attitude is often considered to be a stable personality trait, categorizing individuals into risk-seeking or risk-averse (Weber & Hsee, 1998). However, risk-taking attitude appears

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to be a complex construct. In recent years, many studies have shown that proneness and perception of risk vary, depending on the type of behaviour (e.g. financial, health, social) and on the situational context (Blais & Weber, 2006). An individual can exhibit high levels of risk-taking behaviour in one area (e.g. extreme sports) and moderate or low levels in other (e.g. gambling) (Hanoch, Johnson, & Wilke, 2006).

Such life history variables as parental status or reproductive goal may also influence an individual's risk-taking propensity (Wang, Kruger, & Wilke, 2009). Natural selection would favour relative risk avoidance in females as infant's survival depends more on maternal than on paternal care (Campbell, 1999). Maternal survival in pregnancy practically equals an offspring's survival. As in gestation there is an increased need for awareness of potential threats in environment (Hahn-Holbrook, Holbrook, & Haselton, 2011), one may expect that risk-taking propensity will decrease during pregnancy. This effect may not manifest equally across risk domains, and may be stronger in some domains than in others. The aim of this research was to analyse if a woman's propensity to risk-taking, risk perception and expected benefits from risky behaviours change during pregnancy. We hypothesised that willingness to engage in risk-taking and expected benefits from risky behaviours will decrease in pregnancy, especially in the risk domains related to health and safety. We also expected that risk perception would increase during pregnancy, regardless the risk domain.

2. Methods

2.1. Participants

The study was a part of a broader longitudinal project on changes in women's physiology and behaviour during pregnancy. Participants were recruited through posting to pregnancy-related websites, leaflets, information in the local newspapers, on the radio, and at local gynaecologists' offices. As a compensation for the participation in the study, Laboratories Expansciences donated cosmetics for pregnant women. One hundred twenty six women took part in the main research project, after signing an informed consent. Among them, eighty one women, without chronic or pregnancy-related health problems, ranging in age from 21 to 38 years (M = 29.63, SD = 3.79), participated in this study. All participants were inhabitants of Wrocław and suburbs. All participants had university ($N = 74$) or high education ($N = 7$), and performed intellectual work ($N = 75$) or light physical work ($N = 6$). All participants were in committed relationships. Forty two women assessed their financial situation as good or very good, and thirty three as average. One participant rated her financial situation during pregnancy as bad. All participants were in the first or the second pregnancy. There was no influence of aforementioned variables on risk-taking propensity, risk perception, and perceived benefits changes in pregnancy (in each case: $p > 0.05$).

2.2. Procedure

Participants visited the laboratory three times during the course of pregnancy, once in each trimester. The first visit was scheduled up to the 12th week of pregnancy (1st trimester; M = 8.06, SD = 2.39). The second was scheduled around the 21st pregnancy week (2nd trimester; M = 21.31, SD = 1.34), and the third around the 33rd pregnancy week (3rd pregnancy; M = 33.70, SD = 1.81).

At each stage of the study women completed the revised Domain-Specific Risk-Taking (DOSPERT) scale (Blais & Weber, 2006), measuring risk propensity across a number of everyday situations, and filled in the questionnaire containing questions on age, level of education, relationship status, place of living, socio-economic status, reproductive history, health during pregnancy, and fetus's sex. None of those variables influenced the DOSPERT score at none of the pregnancy trimesters (in each case: $p > 0.05$).

DOSPERT (Weber, Blais, & Betz, 2002) is a widely used psychometric scale, assessing both conventional risk attitudes (the reported level of risk-taking) and perceived risk attitudes (the willingness to engage in a risky activity as a function of its perceived riskiness) in five domains: financial decisions (e.g. “Betting a day's income on the outcome of a sporting event”), health/safety (e.g. “Driving a car without wearing a seat belt”), recreational (e.g. “Bungee jumping off a tall bridge”), ethical (e.g. “Passing off somebody else's work as your own”), and social decisions (e.g. “Speaking your mind about an unpopular issue in a meeting at work”). The scale has been used and validated in a wide range of settings and populations (Markiewicz & Weber, 2013; Roberts, Newell, Simões-Franklin, & Garavan, 2008; Weller & Tikir, 2011). In this study, the revised DOSPERT scale (Blais & Weber, 2006) was used, which is shorter and applicable to respondents from a broader set of age groups, cultures, and educational levels, comparing to the original DOSPERT scale (Weber et al., 2002). Each risk domain of the revised DOSPERT version (Blais & Weber, 2006) contains six items. On the three separate response scales respondents rate the likelihood on a 7-point Likert-type scale that they would engage in a hypothetical domain-specific risky activities (Risk-Taking), perception of the magnitude of the risks (Risk Perception) and expected benefits (Expected Benefits) of risky activities (Blais & Weber, 2006). The rating scores result in the domain score (ethical, financial, health/safety, recreational, social), with the minimal possible score of 7 and maximum of 49 points, in each domain and each subscale (Risk-Taking, Risk Perception, Perceived Benefits). As some questions on DOSPERT scale concern drinking alcohol and sports forbidden in pregnancy (e.g. skydiving, bungee jumping) the participants were instructed to answer the questions according to how they felt at the moment, but trying not to take into consideration the fact that she was pregnant at the time.

All procedures and study design were approved by the Ethics Committee of the Lower Silesia Doctors Chamber (DIL, Wroclaw, Poland).

2.3. Statistical analyses

The differences between the risk domains in each pregnancy trimester were analyzed with one-way ANOVA. The post-hoc analyzes were performed using Tukey's test and with *t*-test for means of independent variables. The correlations between risk-taking, risk perception and perceived benefits within the risk domains were estimated with Pearson's correlation coefficient. Changes in risk-taking, risk-perception and expected benefits in each domain of risky behaviours were analyzed with ANOVA for repeated measures design and Tukey's test. The statistical analysis was carried out with Statistica 19.0 Software.

3. Results

3.1. Risk-taking propensity across pregnancy

The mean values and standard deviations for the scores in five risk domains on three subscales of DOSPERT, for each pregnancy trimester and ANOVA for repeated design analyzes results for changes in five risk domains between pregnancy trimesters are presented in the Table 1.

Comparison of DOSPERT scores across three subscales and five domains in each pregnancy trimester showed significant differences in risk-taking (1st trimester: $F(4, 400) = 26.67$, $p < 0.001$; $\eta_p^2 = 0.210$; 2nd trimester: $F(4, 400) = 32.60$, $p < 0.001$, $\eta_p^2 = 0.246$; 3rd trimester: $F(4, 400) = 38.31$, $p < 0.001$; $\eta_p^2 = 0.277$), perceived risk (1st trimester: $F(4, 400) = 75.09$, $p < 0.001$, $\eta_p^2 = 0.429$; 2nd trimester: $F(4, 400) = 77.40$, $p < 0.001$, $\eta_p^2 = 0.436$; 3rd trimester: $F(4, 400) = 79.29$, $p < 0.001$, $\eta_p^2 = 0.442$), and expected benefits (1st trimester: $F(4, 400) = 52.22$, $p < 0.001$, $\eta_p^2 = 0.343$; 2nd trimester: $F(4, 400) = 52.35$, $p < 0.001$, $\eta_p^2 = 0.345$; 3rd trimester: $F(4, 400) = 41.51$, $p < 0.001$, $\eta_p^2 = 0.293$). The Tukey's test showed that risk-taking in the social domain was lower than recreational, financial, health/safety and

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