



## Sex differences in tax compliance: Differentiating between demographic sex, gender-role orientation, and prenatal masculinization (2D:4D)

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### ABSTRACT

We used decision-making experiments to investigate tax compliance of women and men and focused on gender-role orientation as well as on the second-to-fourth digit ratio (2D:4D), a putative marker of prenatal testosterone exposure. In 60 experimental periods, participants were endowed with a certain amount of money representing income and had to pay taxes. They were audited with a certain probability and fined in case of detected evasion. Both demographic sex and gender-role orientation were significantly related to tax compliance, whereas 2D:4D was not. Women and less male-typical individuals were more compliant than men and more male-typical individuals. Women and men also differed regarding their taxpaying strategies. Whereas for men audits increased subsequent evasion, women's tax payments were less affected by prior audits.

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## 1. Introduction

Differences between women and men in terms of their financial decisions are of continuing interest in research. Women were found to be more risk averse, especially in certain economic domains (Croson & Gneezy, 2009), and less likely to engage in unethical business behavior than men (Betz, O'Connell, & Shepard, 1989). Research on tax behavior suggests that women are more likely to cooperate and to evade to a lesser extent than men (Hasseldine, 1999). In this paper we use economic decision-making experiments to study tax compliance by women and men.

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There are two ways to approach the issue of tax compliance. There is the economic approach based on rational choice theory (Allingham & Sandmo, 1972) where taxes are paid or evaded strategically. Furthermore, there is a socio-psychological approach, where tax compliance is seen as determined by psychological factors like fairness considerations and moral perceptions (e.g., Kirchler, 2007).

In line with the literature on sex differences in risk-taking behavior (Croson & Gneezy, 2009) and tax compliance (Hasseldine, 1999), we assumed that women should exhibit higher levels of tax compliance, whereas men should show greater levels of evasion. The greater tendency among men to evade taxes was assumed to be related to (i) socialization differences that manifest themselves in different gender-role orientation and self-concepts of women and men and/or to (ii) underlying biological differences (foremost, prenatal testosterone exposure). We differentiated between these two indicators of gender vs. sex differences, i.e., gender vs. a biological indicator of masculinity (2D:4D). Research on gender differences in financial decision-making showed that apart from demographic sex the identification with masculine attributes also significantly influenced risk-taking (Meier-Pesti & Penz, 2008). To the best of our knowledge, 2D:4D as a biological marker for femininity/masculinity has not yet been studied in tax compliance research. Sapienza, Zingales, and Maestriperi (2009) suggested biological reasons for gender differences in financial risk aversion and in risky career choices by taking into account circulating testosterone and prenatal testosterone exposure. The research question we addressed regards differences between women and men in tax compliance and possible biological and/or social sources as causes of these differences.

The remainder of this paper is organized as follows: First, empirical results on demographic sex and gender in tax research and adjacent research areas are presented. Second, the methods and procedures of this study are described. Third, the effect of demographic sex on tax compliance is analyzed by differentiation between gender and a biological marker of early masculinization (2D:4D). Fourth, the results are discussed.

### 1.1. Differences between women and men in tax compliance

Tax compliance has been found to be related to perceived probability of audits and fines, as suggested by the rational choice model in economics (Allingham & Sandmo, 1972). Additional determinants were detected as well, however, such as age, sex, income, and psychological determinants (for a review, see Kirchler, 2007). Whereas empirical studies consistently support a positive relationship between age and tax compliance (e.g., Vogel, 1974), the findings regarding sex are less consistent (for an early review, see Jackson & Milliron, 1986). In the case of significant sex differences, women have often been found to be more compliant than men (e.g., Bazart & Pickhardt, 2009; Gerxhani, 2007; Hasseldine, 1999; Lewis, Carrera, Cullis, & Jones, 2009; Mason & Calvin, 1978; Porcano, 1988; Spicer & Becker, 1980; Spicer & Hero, 1985; Vogel, 1974; Wilson & Sheffrin, 2005). Several studies, however, considered sex differences as a side-effect rather than the central research question. One notable example of an exception was a study by Hasseldine (1999), who explicitly studied differences between women and men in tax compliance. Using self-reported responses from a sample of 605 taxpayers, he found differences between women and men in both attitudes towards non-compliance as well as in non-compliance behavior. Women were found to be more compliant than men.

Some studies failed to find sex differences or observed that women were not generally more compliant than men. For instance, Kirchler and Maciejovsky (2001) asserted that women's self-reported tax compliance was lower than men's. Friedland, Maital, and Rutenberg (1978) found women more likely to evade taxes, but to a smaller extent than men. Chung and Trivedi (2003) found women more compliant than men only after providing the sample with persuasive reasons to pay taxes. Wenzel (2002) found women to be more compliant with regard to reported income and deduction claims, but no sex differences regarding reports of extra income. Torgler and Schneider (2004) reported higher tax morale for women than men in Switzerland and Belgium, but minor differences in Spain. It has to be noted that results not indicating differences between women and men are often not even reported (Unger, 1979). Although empirical findings are mixed, when there were significant sex differences, women were more compliant than men.

Differences in tax compliance between women and men might be because of different ethical standards (Chung & Trivedi, 2003; Grasso & Kaplan, 1998; Torgler & Valev, 2006), as well as due to differences in risk propensity (for a general review, see Byrnes, Miller, & Schafer, 1999). Compared with men, women were found to overestimate the detection probability and severity of fines in case of detection (Hasseldine, 1999; Kinsey, 1992; Richards & Tittle, 1981; Smith, 1992). Survey data suggest that differences between women and men in financial risk-taking interact with other demographic variables, like marital status (Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998).

Most of these studies on differences between women and men considered only demographic sex. Differences between women and men may be caused, not only by biological differences, but also by gender-role orientation and characteristics associated with gender (feminine traits, such as socially desirable behavior and friendliness; and masculine traits, such as dominance, competitiveness, and aggression; see Bem, 1981; Eagly, 1987). Differences between women and men in tax compliance should be interpreted with caution because effects might be owed to factors covarying with demographic sex, such as socialization and education, or with interest and involvement in the topic at stake.

A differentiated usage of the terms "gender" and "sex" is needed rather than inappropriate use of the two concepts as synonymous (Gentile, 1998). Whereas "gender" refers to cultural influence, social categorization, and identity, "sex" is related to characteristics that are caused by underlying biological differences (Anselmi & Law, 1998; Unger, 1979).

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