Personality and attitudinal correlates of meat consumption: Results of two representative German samples

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A R T I C L E   I N F O

A B S T R A C T

The vast amount of meat consumed in the Western world is critically discussed with regard to negative health consequences, environmental impact, and ethical concerns for animals, emphasizing the need to extend knowledge regarding the correlates of meat consumption in the general population. In the present article, we conducted two studies examining the associations between meat consumption and personality traits, political attitudes, and environmental attitudes in two large German representative samples (N_{total} = 8,879, aged 18—96 years). Cross-sectional data on frequency of meat consumption, socio-demographics, personality traits, and political and environmental attitudes were collected via self-reports. In both studies, male sex, younger age, and lower educational attainment were significantly positively related to meat consumption. In Study 1, results of the partial correlations and the hierarchical regression analysis controlling for socio-demographics showed that the personality traits of openness and agreeableness, as well as conservative political and social views, explained unique variance in meat consumption. In Study 2, partial correlations and hierarchical regression analyses showed that openness, agreeableness, and conscientiousness were all uniquely negatively related to meat consumption. Moreover, these analyses documented that people scoring high in right-wing attitudes and low in pro-environmental attitudes reported more overall meat consumption. Taken together, these two studies provided evidence that socio-demographics, personality traits, and attitudes are indeed related to how much meat is consumed. Implications and future prospects for the study of individual differences in meat consumption are discussed.

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Meat is consumed in vast quantities in the Western world (North American Meat Institute, 2015). Worldwide meat consumption has increased from 47 million tons to 308 million tons in the last 60 years, with annual per capita consumption more than doubling from 17 to 43 kg per year (FAOSTAT, 2015; Heinrich-Böll-Stiftung, 2014). This high intake of meat has been associated with elevated risk for a variety of diseases, such as cardiovascular diseases, type 2 diabetes, cancer, and mortality in general, as documented in multiple epidemiologic studies (Bellevia, Larsson, Bottai, Wolk, & Orsini, 2014; Bouvard et al., 2015; Micha, Wallace, & Mozaffarian, 2010). In addition to these negative health consequences, meat consumption has been viewed critically due to ethical concerns for animals (Singer, 1977), as well as its negative impact on the environment (United Nations, 2006).

In light of these possible negative effects, it seems important to extend our knowledge about the antecedents and correlates of meat consumption in the general population. Candidate variables from the social sciences that have been tentatively linked to meat consumption are, among others, socio-demographics (Lea & Worsley, 2001; Max Rubner-Institut, 2008), personality traits (Keller & Siegrist, 2015), political attitudes and environmental attitudes (Dhont & Hodson, 2014; Worsley & Skrzypiec, 1998). Indeed, recent research has linked sex, age, and socio-economic status with meat consumption (e.g., Aston, Smith, & Powles, 2013; Gifford & Nilsson, 2014; Lea & Worsley, 2001; Tobler, Visschers, & Siegrist, 2011; Wiig & Smith, 2008), with males, younger individuals, and those with lower socio-economic status reporting a greater intake of meat compared to women, older people, and individuals with higher socio-economic status (for an overview see Stoll-Kleemann & Schmidt, 2016).

The Big Five personality traits (i.e., openness, conscientiousness, agreeableness, extraversion, and neuroticism; Digman, 1990) are

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associated with eating choices and habits (Bogg & Roberts, 2004; Brummett, Siegler, Day, & Costa, 2008; Goldberg & Strycker, 2002; Mõttus, Realo, Allik, Deary, Esko, & Metspalu, 2012). To our knowledge, only a few studies have investigated the relationship between the Big Five and frequency of meat consumption (Keller & Siegrist, 2015; Kessler et al., 2016; Mõttus et al., 2013; Mõttus et al., 2012; Tiainen et al., 2013). These studies, however, have produced inconsistent results with respect to zero-order correlations between personality traits and meat consumption: Tiainen et al. (2013) showed that the consumption of meat and meat products was positively associated with extraversion, and negatively related to openness and agreeableness. Keller and Siegrist (2015) found that less open and less agreeable individuals reported more meat consumption compared to more open and agreeable people, while Mõttus et al. (2013) found that openness, conscientiousness, and agreeableness were positively related to a health-aware diet that included less meat consumption. In another study, openness, conscientiousness, and extraversion were positively associated with a health-aware diet, while neuroticism was negatively correlated (Mõttus et al., 2012). However, these studies used non-representative samples or investigated meat consumption indirectly as a part of a certain diet type.

Regarding political and environmental attitudes, recent research using convenience samples has shown that meat consumption is positively associated with conservatism and right-wing ideologies like social dominance orientation (Sidanius & Pratto, 1999) and right-wing authoritarianism (Altemeyer, 1981; see Allen, Wilson, Ng, & Dunne, 2000; Dhont & Hodson, 2014; Monteiro, Pfeiler, Milburn, & Patterson, 2017; Veser, Taylor, & Singer, 2015), and negatively associated with concern for the environment (Worsley & Skrzypiec, 1998).

In sum, past research that has investigated the relationship between meat consumption and personality traits, political views, and environmental attitudes has predominantly used non-representative convenience samples, producing inconsistent results with respect to personality traits. A recent study using a representative sample of the German population found that more open, less conscientiousness, and less conservative individuals define themselves more often as vegetarian or vegan than as meat eater (Pfeiler & Egloff, 2018). No investigation, however, has yet been conducted regarding whether and how frequency of meat consumption is associated with personality traits and attitudes in a representative sample. The objectives of the present studies are therefore to use two representative German samples (1) to investigate the bivariate relationships between meat consumption and sociodemographic variables, the Big Five personality traits, political attitudes, and pro-environmental attitudes; (2) to test whether personality traits and attitudes are associated with meat consumption when adjusting for socio-demographic factors; and (3) to analyze the unique association of each variable with meat consumption.

1. Study 1: the German Socio-Economic-Panel (SOEP)

In Study 1, we investigated the relationship between meat consumption and socio-demographic variables, the Big Five personality traits, and political attitudes in a German representative Sample.

1.1. Methods

The data used in Study 1 were provided by the German Socio-Economic Panel (SOEP) of the German Institute for Economic Research (Wagner, Frick, & Schupp, 2007) and the Innovation Sample of the SOEP in 2015 (SOEP-IS; https://doi.org/10.5684/soep.

is.2015; Schupp et al., 2016). The SOEP-Core panel is a large longitudinal representative survey of private households and persons in Germany that has been conducted since 1984. The SOEP-IS panel is a subsample of the SOEP-Core panel; it was designed for short-term experiments, as well as for long-term surveys that are not possible in the SOEP-Core (see Richter & Schupp, 2012). The annual interviews of the SOEP-IS started in 2011 and have contained innovative modules, which are selected through a peer-reviewed competition. The meat consumption question was assessed in the 2015 SOEP-IS, and the individual difference variables were assessed in the SOEP-Core in 2013 and 2014 as well as in the 2015 SOEP-IS. We matched all data sets via a unique identifier for each person.

Study 1 contained $N = 5127$ individuals (52.5% female, 47.5% male) who answered the meat consumption question (see below) in the 2015 SOEP-IS. Their mean age was 52.25 years ($SD = 18.37$).

Self-reported meat consumption was assessed with one item ("How often do you consume meat, fish, poultry or sausages?") on a 6-point scale (1 = *never*, 2 = *once a month or less often*, 3 = *on two to four days monthly*, 4 = *on two to three days weekly*, 5 = *on four to six days weekly*, or 6 = *daily*) in the SOEP- IS 2015.

As socio-demographic variables, we analyzed age (in years), sex (0 = *men*, 1 = *women*), household after-tax income, and education as reported in 2015. Education was assessed at the individual level using multiple items, with categories based on the International Standard Classification of Education (ISCED-1997). These categories are: 0 = *in school*, 1 = *school dropout*, 2 = *lower secondary education*, 3 = *upper secondary education*, 4 = *post-secondary non-tertiary education*, 5 = *first stage of tertiary education*, 6 = *second stage of tertiary education* (for details, see Organization for Economic Co-Operation and Development, 1999). Monthly household after-tax income was generated in the SOEP and given in Euro (Schwarze, 1995).

The Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) were measured using a 15-item German short version of the Big Five Inventory (BFI-S; Gerlitz & Schupp, 2005; see Hahn, Gottschling, & Spinath, 2012; for its validity) in the SOEP-CORE in 2013. Openness, conscientiousness, agreeableness, extraversion, and neuroticism were measured using three items, with a 7-point-type Likert scale that ranged from 1 (*does not apply at all*) to 7 (*applies completely*). Cronbach's alpha for the Big Five personality traits were: Openness: $\alpha = 0.60$, conscientiousness: $\alpha = 0.58$, extraversion: $\alpha = 0.67$, agreeableness: $\alpha = 0.42$, and neuroticism: $\alpha = 0.62$.

Conservative political attitudes were assessed using one item on an 11-point Likert-type scale ("In politics people sometimes talk of left and right. Where would you place yourself on a scale from 0 to 10 where 0 means the left and 10 means the right?") in the 2014 SOEP-Core.

1.2. Statistical analysis

Meat consumption and personality traits were assessed in different years, leading to different sample sizes in these variables. Additionally, because of the extremely short personality traits measure, we excluded participants with missing data for one of the items. These exclusion criteria resulted in different Ns being reported in Table 1. We investigated the bivariate relationships between meat consumption and sociodemographic variables, the Big Five personality traits, and political attitudes by analyzing zero-order correlations between these variables. To test whether the associations between meat consumption and personality traits and political attitudes held after adjusting for socio-demographics, we examined partial correlations. A hierarchical regression analysis was used to analyze the unique association for each variable that was significantly associated with meat consumption in the