How Does Masculinity Impact on Health? A Quantitative Study of Masculinity and Health Behavior in a Sample of UK Men and Women

Authors

Sloan, C. Conner, M. and Gough, B.

Abstract

Masculinity is implicated in men's health practices (e.g. Courtenay, 2000). However there is little quantitative work in the UK that examines this relationship for both men and women. This study addressed this gap in the literature and examined the moderating effect of gender on the relationship between elements of masculinity and positive (physical activity, unsaturated fat, fruit and fiber) and negative (smoking, alcohol and saturated fat intake) health behaviours. A community sample of 182 men and 274 women (mean age = 35.89 years) were recruited from a call centre and a local authority in the North East of England. Participants completed self-report measures of Masculine Gender Role Stress (MGRS), Male Role Norms (MRN), Extended Personal Attributes (EPAQ), and Health Behaviors. Hierarchical regression analysis controlled for the effects of age, education and ethnicity and revealed that aspects of masculinity measured by the MGRS and the MRNS predicted worse health behaviors for both men and women (i.e. lower levels of positive health behaviors and higher levels of negative health behaviors), although these relationships were more numerous and stronger for men. Agency traits measured by the EPAQ were predictive of increased physical activity regardless of gender, and less saturated fat intake for men. Results are discussed in terms of their implications for and applications to health promotion.

Key Words: masculinity, quantitative, health behavior, gender, health promotion.

How Does Masculinity Impact on Health? A Quantitative Study of Masculinity and Health Behavior in a Sample of UK Men and Women

Masculinity is an important influence on health behaviors (see e.g. Gough & Robertson, 2009), especially for men (though research on masculinity and womens' health remains sparse). Men in the USA and Western Europe experience higher mortality rates for all common causes (Courtenay, 2005; White & Cash, 2004; Gorman & Read, 2007**)** and links have been established between lifestyle factors, illness and mortality (Martin-Moreno Soerjomataram, & Magnusson, 2008). Perhaps most notably the health behaviors relating to diet, alcohol consumption, physical activity, and smoking have been examined as modifiable determinants of health status (Ford, Zhao, Tsai, & Li, 2011); and sex differences have been noted for these health behaviors. For instance, as a group, men have been reported to make less healthy food choices across 24 countries (Wardle, Hasse, Steptoe et al., 2004), and consume more alcohol than women across the USA and Western Europe (Centers for Disease Control & Prevention: CDC, 2013; Mens Health Forum, 2013; Makela et al., 2006). However, men as a group have also been reported to engage in more physical activity than women (World Health Organization (WHO: 2013). US males are more likely than women to be smokers (CDC, 2011), although this trend is narrowing, and currently there are no statistically significant gender differences for smoking in the UK (Office for National Statistics (ONS: 2009). Gender differences and changing patterns in health behaviors between the sexes implicate the influence of social variables.

We know that masculinity is implicated in men's health-defeating practices (e.g. Courtenay, 2000a). The seminal work of R. Connell (e.g. 1995) on masculinity is highly relevant here. The concept of 'hegemonic masculinity' is particularly apposite in discussions of men's health – it refers to valued marker/s of masculinity which pertain within a given community at any given time and helps to shape relations between men and women, and between men. Traditionally in most societies men are positioned as strong, stoical and self-sufficient, for example, and it is precisely such attributes which inhibit many men in caring for their physical and psychological health (Courtenay, 2000) since displaying a concern for one's wellbeing may be deemed feminine or weak (Courtenay, 2005).

For instance, help-seeking and emotional expression are coded as feminine and so many men may prefer more action-oriented coping styles (Davis, 2000), which can include worse health behaviors (Eistler, Skidmore & Ward, 1988; Uy, Massoth & Gottdiener, 2013), such as alcohol consumption. Diet has also been discussed as gender relevant, and research has revealed links between masculinity and meat consumption (Rothgerber, 2011; Stibbe, 2004). Also, qualitative work (deVisser, 2013) has demonstrated that when engaging in masculine relevant health behaviors, such as alcohol consumption, 'masculine capital' is gained. This capital can then be traded for engagement in more feminine (and healthier) forms of behavior (de-Visser, 2013; Emslie, Hunt & Lyons, 2013). Research also suggests that perception of the normativity of other men's health behavior can influence one's own health behavior (Mahalik et al., 2007). In addition, it is important to note that aspects of masculinity have been shown to be related to health-promoting behaviors. For example, qualitative research (Sloan, Gough & Conner, 2010) with men who pursue a healthy lifestyle found that the men drew on masculine-relevant themes to reject poorer health practices and construct themselves as autonomous, a valued masculine position. Furthermore, Emslie et al. (2013) found that drinking alcohol with other males was viewed as facilitating friendships and providing a gender relevant context for the discussion of emotions that may not have been sanctioned in other environments.

Clearly there is some fluidity in masculine positioning around health behavior (Emslie et al., 2013); indeed, masculinity has been described as a 'floating signifier' (Moylihan, 1998) - the ways of being a man are so diverse and dynamic that masculinity (or 'masculinities') cannot be reduced to a single concept (see also Connell, 1995) – although the capacity for men to take up particular masculine positions will be influenced and constrained by other social identities and practices, for example pertaining to social class, race and ethnicity, or peer group status (see Gough & Robertson, 2009; deVisser, 2013). This stance poses obvious difficulties for researchers who attempt to quantify the association between 'masculinity' and health behavior. However, across many theoretical and empirical papers several key constructs have been highlighted, such as being strong and in control. Consequently, rather than measuring 'masculinity' per se, scales have been designed to measure

specific constructs associated with masculinity (see Bem, 1981; Brannon & Juni 1984; Eistler & Skidmore, 1987; Mahalik, 2003; O'Neil, Helms, Gable, & David, 1986; Spence & Helmreich, 1978; Thompson & Pleck, 1986).

Problems with masculinity measures include the fact that many have been developed using young student samples. Also, most measures have been developed in North America, which may limit the scales' appropriateness for different age and cultural groups (Monk & Ricciardelli, 2003). In addition, other constructs and ideologies of masculinity exist that are not measured by the items in these scales, e.g. traditional masculine beliefs about taking control of ones health. However, relationships between measures of aspects of masculinity and health behaviors have been established for groups of gay men (Hamilton & Mahalik, 2009), American and Kenyan men (Mahalik, Lagan & Morison, 2006), student populations (Eister, Skidmore &Ward, 1988; McCreary, Newcombe & Sadava,1999), older males (Tannenbaum & Frank, 2011), alcohol dependent men (Uy et al., 2013) and Australian men (Mahalik, Levi-Minzi & Walker, 2007).

Quantitative Studies of Masculinity and Health Behaviors

Earlier quantitative studies of masculinity and health behaviors tended to examine substance misuse (McCreary et al., 1999; Monk & Ricciardelli, 2003; Snell, Belk & Hawkins, 1987), particularly alcohol consumption. A study by McCreary et al. (1999), using Thompson and Pleck's (1986) Male Role Norms Scale (MRNS) found a direct relationship between high alcohol consumption and men who believed achieving status, and demonstrating toughness and anti-femininity was important. The Masculine Gender Role Stress Scale (MGRSS: Eistler et al.,1988) measures stress resulting from threats to male role competence in areas, such as Emotional Expression, Subordination to Women and Physical Inadequacy. McCreary et al.'s study also found that higher ratings on this scale were related to 'problematic alcohol behaviour' for men. Conversely, the same study found that socially desirable and stereotypical masculine traits (assertiveness, confidence), as measured by Spence and Helmreich's (1978) Agency Factor of the Extended Personal Attributes Questionnaire (EPAQ), were negatively related to alcohol problems for men. For women,

only the MRNS was directly related to alcohol problems. The authors discussed their findings in terms of gender socialization theory, where certain behaviors may be socialized as more salient for a particular gender; and in this case highlights an important association between masculinity and alcohol, particularly for men.

A more recent study by Iwamoto et al. (2013) found that Conformity to Dominant Masculine Norms (CMNI: Mahalik et al., 2003) in US culture, in particular Playboy and Risk taking factors, were directly predictive of increased alcohol use, while other CMNI factors - Emotional Control and Heterosexual Presentation - were related to less alcohol use. These results show that not all masculinity scale factors are predictive of negative health behaviors, and emphasizes the utility of examining masculinity scale factors as independent variables as opposed to using whole scale scores.

More recent quantitative studies have examined a wider variety of health behaviors. With regards to diet, Mahalik et al. (2007) found that Australian men who rated higher on the CMNI reported consuming less fibre and fruit. Furthermore, Rothgerber (2012) reported that MRN were related to increased meat consumption for both men and women. In addition, Helgeson (1995) found that socially undesirable traits (Unmitigated Agency: EPAQ), more usually associated with male roles (e.g. arrogance), were predictive of smoking status following Myocardial Infarction (MI). Masculinity measured using the Bem Sex Role Inventory (BSRI; Bem, 1981) has also been found to be predictive of smoking (Emslie et al., 2002). Conversely, femininity measured using the BSRI has been found to be predictive of smoking status in older males (Hunt et al., 2004). There is little quantitative research that has addressed the relationship between physical activity levels and masculinity, although Helgeson (1995) found that more positive masculine traits (Agency) were related to problem-focused coping and increased physical activity levels following MI.

The Current Study

This review of relevant research illustrates that quantitative relationships have been established between aspects of masculinity and health behaviors for certain groups of men, with some

contradictory findings. That is, not all aspects of masculinity have been found to be related to worse health behavior (Iwamoto et al., 2013; McCreary et al., 1999).

Also, although some studies have included female participants (McCreary et al .1999; Rothgerber, 2012), many do not (Mahalik et al., 2006; Iwamoto et al., 2013). There is very little research examining the moderating effect of gender on the relationship between masculinity and health behavior. Taking a social constructionist position, it is hypothesized that masculinity is largely socialized, and so may be adopted as a way of behaving by females also. For example, it may be appropriate for a woman to behave in line with masculine norms of Toughness – for example if they live in a high crime area, or are employed in a male dominated environment, where perhaps femininity could be associated with vulnerability. Also, omitting women from masculinity research increases the possibility that research that finds links between male gender, masculinity and health behavior is presumed (Addis & Schwab, 2013). The present study aims to address these gaps in the literature: to date no research has been carried out in a UK setting which takes a multidimensional approach to the study of masculinity and health behaviors, and which includes both men and women. To this end we recruited a UK sample of male and female participants, all in employment and who varied in terms of age, and education (these latter variables have also been shown to have consistent effects on health behaviors: Albery & Munafo, 2008; ONS, 2009). Health behaviors measured in this study were both negative (smoking, saturated fat intake and alcohol consumption) and positive (physical activity, fiber, unsaturated fat and fruit consumption). As suggested by McCreary et al. (1999) we took a multi-dimensional approach to measuring masculinity and used a measure from different paradigms: an ideology measure: Male Role Norms Scale: MRNS (Thompson & Pleck, 1986); a construct measure: Masculine Gender Role Stress Scale (MGRSS; Eistler, Skidmore & Ward, 1988); and a trait measure: Extended Personal Attributes Questionnaire (EPAQ: Spence, Helmreich, & Holahan (1979). For a detailed discussion of masculinity measures and their respective orientations see Levant & Pollack (1995). Based on previous research (Eistler et al., 1988; Helgeson, 1995; McCreary et al., 1999) it was hypothesized that the MGRSS, MRNS and negative masculine

traits of Unmitigated agency (EPAQ) would be related to increased levels of negative health behaviors in men. We were less certain of the direction of effects for women, as there is little previous research for women. However it was hypothesized that the direction of effects would be the same as for men, given that gender is largely socialized. In addition, as previous research has found links between Agency and more positive health behaviors (Helgeson, 1995; Eistler et al., 1988), it was hypothesized that Agency would be related to increased levels of positive health behaviors for both men and women in this study. Aspects of femininity were measured by Communion traits (EPAQ) which measure socially desirable traits associated with the stereotypical female role, e.g. helpful, kind. Research has found links between femininity and both negative (Hunt, 2004) and positive (Hunt, 2007) health behaviors, so we were less certain of the direction of effects for Communion traits (EPAQ) and health behavior. Ultimately we hypothesized that as the feminine role is traditionally constructed as concerned with health, a higher rating of feminine traits could be linked with more positive health behavior for both men and women. Also, it is hypothesized that although the masculinity scales used in this study were developed in North America, the scales would be reliable for this British cohort, owing to a largely shared Anglophone culture.

Method

Participants and Procedure

Study participants comprised a cross-sectional community sample of 182 men and 274 women, who were employed in office based work, recruited from either local government or a call centre in the north east of England. The dual participant pool approach has been used in previous masculinities and health behavior research (Iwamoto et al., 2013; Mahalik et al., 2007), to ensure sufficient variability in terms of participants age and education. This would allow a thorough investigation of the basis of variations in health behavior by masculinity, while demographic variables are controlled for in the hierarchical regression analysis. In addition, multivariate analysis was carried out across participant groups to examine any differences in health behavior responses. Analyses controlled for the effects of age, education, ethnicity and gender. No significant multivariate effect was found (*F*

(7,377) = 1.89. *p* = ns) for group. Therefore group was not further considered in the analysis. Recruitment sites were approached to participate in a study about masculinity and health behavior and subsequently provided with study information sheets and a sample questionnaire. Respective sites were offered health promotion information for employees and a report on the general health behavior of participants as a group. Participation in the study was voluntary and study information sheets clearly stated that participants could withdraw from the study at any time. The mean age for participants was 35 years old (*SD* = 11.50). Educational levels were: 23%, GCSE and below (US equivalent = high School diploma), 28.1% college / A level educated (US equivalent = APs), and 48.9% educated to degree level and above. For the purpose of statistical analysis education level was converted in to 2 groups, those educated to below degree level and above. Ethnic orientation of the group was; 87.2% White, 2.0% Black or Black British, 0.4%, Chinese, 8.8% Asian or Asian British, 0.7% other, and 0.9% mixed. Ethnicity was converted into a dichotomous variable with white British ethnicity comprising group 1 and non-white British comprising group 2, for purpose of statistical analysis.

This study used both an electronic and paper method of survey completion, therefore no data are available on those participants who chose not to complete the survey, or response rates. Ethical approval for the study was obtained from the relevant university ethics committee.

Participation in the study was by completing a self-report questionnaire. This was either a paper and pencil (call centre sample) or an on-line survey (local government sample), adapted according to the logistical requirements of the recruitment site. The two methods were identical in terms of question wording and ordering. In the questionnaire demographic information was requested first, then smoking, alcohol and diet self-report measures. This was followed by the EPAQ, MGRSS, physical activity questions and finally the MRNS items. All surveys were anonymous and completed during working hours. Those that completed the questionnaire were also entered into a prize draw with a £50 (~$75) cash prize. Paper and pencil surveys were collected by the first author on the day of completion, before health promotion information was provided to participants.

Measures

Masculine Gender Role Stress Scale. To measure specific male stressors this study used the Masculine Gender Roles Stress Scale MGRSS (Eisler & Skidmore, 1987). The MGRSS is a forty-item scale, which measures the degree to which men may appraise a situation as stressful (Consenzo, Franchina, Eisler, & Krebs, 2004). Items cluster in five factors or subscales. These are: Physical Inadequacy (MGRSS-PI: α = .73), Emotional Inexpressiveness (MGRSS-EI: α = .69), Intellectual Inferiority (MGRSS-EI: α = .71), Performance Failure factor (MGRSS-PF :α = .75) and Subordination to women (MGRSS-STW: α = .67). Individuals are asked to rate scale items as if they were in that situation and how stressful they would find it; with items scored 1- 6 (1 = not at all stressful, 6 = extremely stressful) . Scale items were presented in the same format for both female and male respondents, consistent with previous research (Eisler et al., 1988; McCreary et al., 1999). Reliability for the scale factors observed by McCreary et al. (1999) are reported above. Reliability for this study was: MGRSS-PI α = .73, MGRSS-EI α = .77, MGRSS-II α = .83, MGRSS-PF α = .74, and MGRSS-STW α = .86; with no substantive difference in reliability by gender.

Male Role Norms Scale. Attitudes about traditional male roles were measured using the Male Role Norms Scale (MRNS; Thompson & Pleck, 1986), which measures traditional North American masculine ideology (Levant & Pollack, 1995). This 26-item questionnaire contains three factors; Toughness (MRNS-TOU: α =.74), Anti-femininity (MRNS-AF: α = 76) and Status (MRNS-STA: α =.81). Respondents are asked to rate the extent (1-7) to which they agree or disagree with the scale item, higher scores on this scale are indicative of more traditional attitudes towards male roles. Previous reliability reported by Thompson & Pleck (1985) for the MRNS-STA, MRNS-TOU and MRNS-AF factors are reported above, alpha values for the present study were .87, .81 and .76 respectively, with no substantive difference by gender.

Extended Personal Attributes Questionnaire. The Extended Personal Attributes Questionnaire (EPAQ: Spence, Helmreich, & Holahan (1979) is a forty item questionnaire which measures socially desirable and undesirable traits typically associated with males or females. For the purposes of this

study only Agency, Unmitigated Agency and Communion traits were assessed. The Agency (EPAQ-AG) factor of the EPAQ measures traits socially desirable for both sexes, but more typically associated with males (i.e. independent). The Unmitigated Agency (EPAQ-UA) factor of the EPAQ measures socially undesirable traits for both sexes, but ones more typically associated with males (arrogant, boastful). Communion (EPAQ-COM) items measure traits socially desirable for both sexes but that are considered more desirable for females, i.e. '*helpful'* or '*kind'*. Participants are required to rate on a scale (1-5), the extent to which a trait describes them, with higher ratings on certain traits indicating a higher internalisation of those traits. Following reliability analysis; one item *'ease of decision making'* was removed from EPAQ-AG, the item '*cynical'* was removed from the EPAQ-UA and the item '*emotional*' was removed from EPAQ-COM, due to low item-total correlation. The lowest Cronbach's alpha reported for the EPAQ factors was for EPAQ-UA ($\alpha = .61$). Although this value is somewhat low, it was considered acceptable for the exploratory purpose of this study. Cronbachs' alpha values for EPAQ-AG ($\alpha = .74$) and EPAQ-COM ($\alpha = .70$) were considered satisfactory, with no substantive differences noted by gender. Previous reliability reported by McCreary, Saucier, and Courtenay (2005) for the EPAQ-AG, EPAQ-COM and EPAQ-UA factors were .74, .80, and .71 (men), and .73, .70, and .62 (women) respectively.

Smoking. Smoking behavior was measured via a single item asking participants if they smoked or not. Smoker status was coded 0 = non smoker, 1 = current smoker.

Diet. Dietary behavior was assessed using The DINE questionnaire. The DINE questionnaire is a weighted food frequency questionnaire (FFQ) consisting of 19 foods which accounts for 70 % of fat and fiber in the typical UK diet, with particular attention given to the main food sources of saturated fat (Roe, Strong, & Whiteside, 1994). These food groups provide the respondent's total saturated fat, unsaturated fat (healthy fats) and fiber intake. The DINE Questionnaire allows for categorisation of fat and fiber scores into high, medium and low categories, however for the purpose of this study continuous scores were used for analysis in the regression model. To account for missing data on the dietary variables from the DINE questionnaire, providing at least three foods within each category

(fat, fiber or unsaturated fat) was present, each participant score was reduced to a mean value, then this value was multiplied by the number of foods that comprised fat, fiber or unsaturated fat scores. This procedure produces slightly higher values than the sum procedure recommended in the DINE questionnaire; however the sum procedure does not account for missing data. Saturated fat data was subject to Square Root transformation in order to meet the assumptions of multivariate testing.

Fruit Consumption. Fruit consumption is an indicator of a healthy diet (DoH, 2007). To construct the indicator of fruit consumption used in this study, participants were asked to respond to two items asking them '*how often do you eat fruit'* '(frequency of fruit consumption), and '*how often do you consume more than three portions of fruit per day'* (amount). Responses to these items were scored on a five point Likert scale, with one indicating frequency/amount at least once per day; 2 = every two or three days; 4 = less than once per week; and 5 = Never. Frequency and amount of fruit items were highly correlated ($r = .70$, $p < 0.01$), and later these two items were summed to provided an indicator of fruit consumption. Also, this item was reversed scored so that higher ratings on the fruit item would indicate greater fruit consumption.

Alcohol. To measure alcohol behavior it was explained to participants that 1 unit of alcohol equals 1 small glass of wine, a half pint of beer or a shot of spirits (Morgan & Ritson, 2003). Then, alcohol consumption was measured by asking participants to record how many units of alcohol they had consumed on each day over the past week. Total weekly units were then summed to represent total alcohol consumption. Then, gender relevant alcohol categories were created with females whom consumed under 14 units and males whom consumed under 21 units per week comprising group 1, and males and females whom consumed over these gender relevant ideal levels of alcohol consumption (Morgan & Ritson, 2003), comprising group 2.

Physical Activity. Physical activity levels were measured using the International Physical Activity Questionnaire (IPAQ) short form (Craig et al., 2003). This questionnaire was developed across 12 countries (age range of participants, 18-65 years), with the purpose of designing a questionnaire that can be used to compare exercise data internationally. This questionnaire assesses

type, frequency, duration and intensity of physical activity. Participants are asked how much time they spend, doing vigorous, moderate or light physical activities over the previous seven day period, and scores are later converted to MET-min/week. METS are multiples of resting metabolic rate, and a met score of an activity is computed by multiplying the MET score of an activity by the minutes performed (IPAQ, 2005). For the purposes of this study, only total physical activity levels, measured in METS, were used for data analysis. Test -retest reliability of the IPAQ was assessed across the 12 countries over a 3-7 day period, Spearman's rho clustered around .80. This indicates reliable responses over the 12 countries. Physical activity data in this study presented a non-normal distribution, and was thus subject to log transformation in order to meet the assumptions of multivariate testing.

Negative and Positive Health Behavior Index. To examine effects across groups of health behaviors and also for the purpose of comparison of results in this study and the literature (e.g. Eistler et al., 1988) indices of both positive health behavior (Positive Health Behavior Index: PHBI) and negative health behavior (Negative Health Behavior Index: NHBI) were created. This was done to examine if any of the masculinity scale factors were predicative of overall health enhancing (e.g. PHBI) or more health damaging (e.g. NHBI) behavior. To do this, positive health behaviors (unsaturated fat, physical activity, fiber and fruit consumption) scores were first standardised to *Z* scores, then summed. The same procedure was completed with NHBI, where more health damaging behaviors (saturated fat, smoking and alcohol consumption) were also standardized then summed to comprize this variable. Both PNBI (.34) and NHBI (.30) had low internal consistency. However as these measures are considered to be formative rather than reflective measures then a summed measure may appropriately reflect levels of the performed health behaviour despite low reliability.

Statistical Analyses

We first examined the overall data for men and women by exploring the means and standard deviations for each measured variable and second the intercorrelations. For the first analyses MANOVA analysis was used to explore any gender differences in the mean scores on masculinity

scales and positive and negative health behavior scores. For the second analyses hierarchal multiple regression analysis and logistical regressions for dichotomous variables was used to examine the utility of the different masculinity scales when considered simultaneously in predicting each individual health behavior - and then overall positive and negative health behaviors across men and women combined. We also tested gender as a moderator of the relationships between masculinity measures and health behaviors by testing the significance of the interaction between gender and each masculinity measure after controlling for the main effects of gender and the masculinity measure. Where interactions were significant we decomposed the interaction by testing the significance of the relevant masculinity scale separately in each gender. Multi co-linearity did not present a problem for independent variables (masculinity scales) with no factors correlated above 0.64 and no VIF statistics above 2 (Field, 2005).

Results

Descriptive Statistics

Table 1 shows the descriptive statistics (Mean, *SD*) for each of the masculinity scale factors and health behaviors separately for men and women. Mean ratings for masculinity scale factors were observed to be consistently higher for men compared to women. MANOVA analysis confirmed a significant main effect of gender ($F(11,383) = 7.54$, $p < 0.01$), justifying the exploration of gender differences for each masculinity scale factor. Specifically, gender differences were found for MRNS-TOU ($F(1,393) = 34.48$, $p < 0.01$), EPAQ-AG ($F(1, 393) = 14.05$, $p < 0.01$); EPAQ-UA ($F(1, 393) = 6.72$, $p < 0.05$), EPAQ-COM ($F(1, 393) = 8.81$, $p < 0.01$), MGRSS-PI ($F(1, 393) = 11.24$, $p < 0.01$) and MGRSS-II ($F(1, 393) = 6.88$, $p < 0.01$). Importantly, men scored significantly higher on all of the above masculinity scale factors, except for the EPAQ-COM, or the more feminine traits of the EPAQ. Significant gender differences for health behaviors was tested in the regression analysis and beta values are reported in Table 3. Notably, men compared to women reported significantly higher scores on the NHBI, saturated fat, alcohol, fiber consumption and physical activity even when controlling for other measures.

Relationships Between Masculinity Scales

Table 2 shows the partial correlation analysis for masculinity scales factors, controlling for the effects of age, education and ethnicity. For men, most of the MGRSS factors are significantly positively correlated with MRNS factors (Table 1 below diagonal). This indicates that MGRS and MRN are related factors for this British sample, as has been found in previous research with Canadian participants (McCreary et al., 1999). Furthermore, EPAQ-AG traits are negatively related to MGRSS-II and MGRSS-PF factors, and are also unrelated to the MRNS factors. Indicating this construct is independent of these more problematic aspects of masculinity, as has been found in previous research (Eistler et al., 1988). EPAQ-COM traits are positively correlated with EPAQ-AG, and negatively related to the MRNS-AF and MGRSS factors: EI, PF and II. Perhaps indicating that a higher internalisation of more feminine traits offers some protection against MGRS and more restrictive beliefs about men avoiding traditionally feminine activities. Examining the correlation matrix of the masculinity scale factors for women, a similar pattern is observed between the MRNS and MGRSS factors. However the EPAQ-AG and EPAQ-UA factors are positively correlated, this is not the case for men. This indicates that females might be interpreting these theoretically opposing items differently. Also for women, EPAQ-UA is positively correlated with MRNS-STA and MRNS-AF. This relationship is not observed for male participants. These slightly differing patterns observed between males and females indicate that whilst reliability of the scales differs little between the sexes, scale factors have slightly different correlates which should be considered in future research. Table 3 shows the partial correlations between masculinity scales and health behaviors for both men and women controlling for the effect of age education and ethnicity. Examining the correlation matrix in table 3, more significant relationships are observed between masculinity scales factors and health behaviours for men. However if these relationships significantly differed by gender, and their predictive utility is analysed in the regression analysis.

Predicting Individual Health Behaviors from the Masculinity Variables

The main hierarchal regression analysis examined the utility of the masculinity scales in predicting PHBI and each of the individual positive health behaviors and then NHBI and each of the individual negative health behaviors (controlling for the effects of gender, age, ethnicity and education; Table 4).

As can be seen in Table 4 demographic variables were significant predictors of several health behaviors independent of masculinity measures. Notably, increasing age predicted increased fruit and fiber consumption, but lower ratings of the NHBI, physical activity and smoking. Higher educational group was predictive of increased fruit and fiber consumption but decreased ratings of the NHBI and likelihood of being a smoker. In addition, participants who were non-white British were less likely to consume over the recommend amount of alcohol.

Table 4 indicates several effects of masculinity variables for positive health dependent variables. For example, MRNS-TOU negatively predicted the PHBI, less *fruit* consumption and less unsaturated fat (USF) intake. MGRSS-PF predicted increased USF intake and less physical activity. MGRSS-II predicted less *fiber* consumption and conversely EPAQ-AG predicted increased physical activity.

In relation to negative health behaviors, analysis revealed that, MRNS-TOU and MGRSS-STW were significantly positively predictive of the NHBI. However, conversely, MGRSS- PF predicted lower ratings on the NHBI. In addition, MRNS-TOU, MGRSS-EI and MGRSS- II predicted increased *saturated fat* intake. Logistical regression analysis revealed a trend towards significance for MRNS-TOU and increased *alcohol consumption* (p=0.08). However no significant findings between masculinity variables and *smoking* were observed.

Gender x Masculinity Scale Interactions

We also explored whether the gender moderated the impact of any masculinity measure on the health behavior measures reported in Table 4 by testing the significance of additionally entering a gender by masculinity measure (after mean centring each variable). For the positive health behaviour the following effects were observed. For the PHBI there were no significant masculinity x gender interaction terms. However the gender x MRNS-TOU interaction term was significant for fruit

consumption (ß = -0.32, p < 0.05). Follow up analysis revealed that MRNS-TOU was a predictor of less *fruit* consumption for men (ß = - 0.34, p < 0.01) but not women (ß = - 0.02, ns). The gender x MGRSS-STW interaction term was also significant (ß = -.37, 0.05) for physical activity. Follow up analysis revealed that MGRSS-STW predicted less *physical activity* for men (ß = - 0.22, p < 0.05), but not women (ß = 0.02, ns).

For the negative health behaviors a number of gender moderation effects were also observed. The gender x MRNS-TOU interaction was found to be significant (ß = 0.36, p < 0.05) for NHBI. Follow up analysis revealed that MRNS-TOU was a predictor of the NHBI for men (ß = 0.30, p < 0.01) but not for women. (ß = 0.14, ns). In relation to saturated fat intake the following interaction were significant: Gender x MRNS-TOU (ß = 0.49, p < 0.01), MGRSS-STW (ß = -0.42, p < 0.01) and EPAQ-AG (ß = -0.33, p < 0.05). Follow up analyses revealed that MRNS-TOU was only a predicator of increased *saturated fat* consumption for men (ß = 0.38, p < 0.01), but not for women (ß = 0.405, ns). MGRSS- STW was a significant predictor of increased *saturated fat* for women (ß = 0.16, p < 0.05), but not for men (ß = -0.06, ns); and EPAQ-AG was a predictor of less *saturated fat* consumption for men (ß = -0.19, p < 0.05), but not for women (ß = 0.02, ns). No other gender interaction terms were found to be significant.

Discussion

This study examined the relationship between aspects of masculinity (traits, ideology and gender role stress) and health behavior in a UK sample of men and women. In terms of more health promoting behavior, results revealed that although none of the masculinity scales positively predicted the PHBI, EPAQ-AG traits were predictive of increased physical activity levels. In addition the gender x masculinity scale interaction analysis revealed that EPAQ-AG also predicted less saturated fat consumption for men. EPAQ-AG describes a higher internalization of socially desirable traits (e.g. confidence) more traditionally associated with men. EPAQ-AG traits have been found to be health protective in terms of adjustment to MI (Helgeson, 1995) and less alcohol problems (McCreary et al., 1999). McCreary et al. (1999) argue that perhaps those whom develop more EPAQ-AG type traits

such as mastery and instrumentality may feel that they are meeting societal prescriptions of masculinity and that this is health protective. Also perhaps an increase in a traditionally more masculine behavior such as physical activity incurs masculine capital (de-Visser, 2013). This can then be leveraged against engagement in less traditionally masculine behavior such as reducing saturated fat consumption. However, in this study EPAQ-AG does not predict positive health behavior per se and is not protective against smoking and alcohol consumption, more traditional masculine behaviors. Interestingly, for both men and women in this study EPAQ-AG is negatively related to aspects of MGRS, and has no significant relationship with MRN. This may be a health protective function of EPAQ-AG. Further research is needed to examine the relationship between EPAQ-AG and aspects of masculinity to decipher its correlation with health behavior accounting for the relationship between EPAQ-AG and other measures of masculinity.

MGRSS-PF predicted more positive health behaviour in terms of increased USF consumption, and also lower ratings on the NHBI. MGRSS-PF measures potential stress from failure in the domain of work and sexual adequacy (Eistler & Skidmore, 1987). Previous research (Monk & Riccardelli, 2003) has also found that MGRSS-PF was negatively correlated with poorer health behavior in terms of alcohol problems. Findings may be due to the fact that MGRSS-PF may encourage health promoting behavior in order to maintain health and reduce the possibility of MGRSS-PF - but these effect may be domain specific as MGRSS-PF also predicated less physical activity. However findings remind us that not all elements of masculinity are related to poor health behaviors (Sloan et al., 2010), and further validates the use of masculinity scale factors as opposed to whole scale scores when examining which aspects of masculinity are related to health behavior.

Regarding more negative health behavior, results revealed that aspects of MGRS were predictive of worse health behaviour in terms of diet. That is, MGRSS-EI predicted increased saturated fat consumption and MGRSS-II predicted both increased saturated fat and less fiber consumption. In addition, MRNS-TOU were predictive of lower ratings on the PHBI, higher ratings on the NHBI and worse diet behavior in terms of: less unsaturated fat and fruit consumption, and increased statured fat

consumption. That both MRN and MGRSS are related to health behavior in a similar way in both men and women, indicates that perhaps one's gender role orientation (Hunt, 2004) needs to be considered above biological sex in considering such relationships.

However the gender x masculinity scale interactions revealed gender specific effects, in that MGRSS-STW predicted increased saturated fat intake only for women and lower physical activity levels only for men. Physical activity has been discussed as a masculine relevant activity (Lee & Owens, 2002), with men as a group reporting higher activity levels than women (WHO: 2013). However as results in this study revealed that MGRSS-PF and MGRSS-STW were predicative of less physical activity, it may be that only aspects of masculinity (e.g. EPAQ-AG), not masculinity per se that is positively predictive of physical activity.

In addition, the interaction analysis revealed that MRNS-TOU was the most important predictor of worse health behavior for men in this study. Specifically, the gender x masculinity scale interactions revealed that MRNS-TOU predicted increased saturated fat consumption, less fruit and higher scores on the NHBI only for men. Thus, results indicate that while the scales may be valid for both men and women, MRNS-TOU is a better predictor of worse health behavior for men. This may be due to the increased salience of this relationship for men (McCreary et al., 1999), as MRNS-TOU beliefs are socialised more commonly around male gender. MRNS-TOU norms pertain to attitudes about men being physically, emotionally and mentally tough (Thompson & Pleck, 1986). It is frequently discussed in the masculinities literature that Toughness is traditionally construed as a desirable or hegemonic masculine attribute and that men may feel particular pressure to construct themselves as tough (e.g. Connell, 2000; Courtenay, 2000). This can be done by rejecting that which is feminine, because of the negative social consequences that can result from engaging in behaviour deemed culturally gender inappropriate (Kimmel, 1994).

Though there was a trend towards significance between MRNS-TOU and alcohol consumption, the masculinity scale factors in this study mostly predicted worse health behaviour in terms of diet. Diet is traditionally constructed as a feminine interest and it has been suggested that doing masculinity can

involve the avoidance of feminine behavior for fear of being unmasked as feminine (Kimmel, 1994). It follows that if behavior such as diet is traditionally constructed around feminine roles this can present developmental barriers to engaging with dietary behaviour for men (Lee & Owens, 2002). Masculine ideological barriers such as MRN and MGRS generated from deviation from masculine roles (MGRS) may function psychologically as a set of values that diet and cooking are generally the interest of women. Then in practice some men do not engage in conspicuous healthy eating, as this conflicts with masculine ideology and could result in stress if one deviates from this position. As diet is a major predictor of the largest causes of mortality for both men and women (Ford et al., 2011), considering the cultural influence (Ming Liu, 2005) of masculinity on some men and women's health behaviors is of some importance.

Despite our initial hypothesis, the EPAQ-COM and EPAQ-UA were not predictive of any health behavior for men or women. In addition, MGRSS-PI, MRNS-STA and MRNS-AF were not directly predictive of health behavior in this study. However, it may be that these factors are related to health behavior indirectly through their relationship with other male role variables. Also the EPAQ-UA did have lower than desirable reliability (.61), and this may have affected findings.

Study Limitations

Although this study makes an important contribution to the literature in providing empirical evidence of relationships between aspects of masculinity and groups of health behaviors plus individual health behaviors, several limitations should be noted. Masculinity is a diverse and complex signifier that would have been defined differently had we used different masculinity questionnaires. Furthermore, the data collection method was a self-report questionnaire, completed in a work environment. This may have presented social desirability issues, although participants were informed that the questionnaires would be anonymous. Also, most study participants were office based workers, and so not a random sample. Perhaps a different sample may have provided yet more insight into the strength of relationships between masculinity and health behaviors in different occupational groups. Furthermore, this study did not carry out purposive sampling, so the extent that we can control for the

effects of age and ethnicity is somewhat limited. As the mean age of participants were relatively young adults (mean age 35 years), a wider age group may have provided different results. In addition, to control for the effects of ethnicity in the regression model we used a dichotomous variable (white British and non-white British), with the non-white British group mostly composed of Asian or Asian British participants. More targeted sampling in terms of ethnicity would have provided more detail regarding specific non-white British groups. However, this dummy coding was deemed necessary due to low numbers of non-white British participants. Since this study is cross-sectional, how the quantitative relationship between aspects of masculinity and health behavior may change over the life course, in different circumstances and for different groups of men and women, is not known and longitudinal data would help inform this issue. Furthermore, the PHBI and NHBI were constructed as formative indices of overall health behavior, and as such internal consistencies are not relevant. However, had we used different behaviors to tap overall positive and negative health behaviors, different results could have been found. Finally, all results are correlational and therefore do not indicate that these are causal relationships.

Conclusion and Future Directions

Although this study demonstrated links between aspects of masculinity and negative health behavior particularly in terms of diet, aspects of masculinity such as EPAQ-AG was related to health promoting behavior, This raises the additional question that if more research were focused on aspects of masculinity related to health promoting behavior, perhaps more links would be found. Such research could help inform the design of health promotion interventions for men. However, it has been discussed (Lee & Owens, 2002) that health promotion often locates the health behavior of men at the level of individual choice, ignoring the social context of masculinity in which behaviour occurs. This could perhaps lead to less successful, or at least less empathic interventions with men. If aspects of masculinity, such as EPAQ-AG, could facilitate behavior change, this may help some men to maintain their masculinity in a health environment, which may be viewed as feminine. This can be done by framing change as taking control of ones health etc (see Sloan et al., 2010). Alternatively, if

MRNS-TOU type beliefs are identified in a health setting that present a barrier to behavior change, beliefs could be respectfully and collaboratively challenged with cognitive behavioral interventions (Mahalik et al., 2006; Mahalik et al., 2007). For example, this can be done through cognitive re-structuring, examining evidence for and against beliefs such as *'if I don't drink others will think I am weak'* (Mahalik et al., 2007). Or, behavioral experiments could be designed to test out any anticipated negative beliefs about peers' reactions if a person decides to not drink alcohol for example.

Of course not all men will endorse masculine norms and for some they may be irrelevant to the construction of their health behavior, if this is not their gender role orientation, or if they adopt masculinity dimensions flexibly according to context (Robertson & Gough, 2009). In addition, some women may also construct their health behaviors around themes of toughness if this is their role orientation; and this has implications for health promotion work with women.

Other potential moderators and mediators of the relationship between masculinity and health behaviors need to be identified (Mahalik et al., 2007). For example future research questions could include: how does health knowledge mediate the relationship between masculinity and health behaviour, and how could gender potentially moderate this relationship? This is because knowledge and access to healthy behaviours, particularly around diet, may be restricted by cultural interpretations of masculinity that position this behavior as a feminine concern.

References

Addis, M. E., & Schwab, J. R. (2013). Theory and research on gender is always precarious. *Psychology of Men & Masculinity, 14*, 114–116.

Albery, I. & Munafo, M. (2008*). New concepts in health psychology*. London: Sage.

Bem, S. (1981). Gender schema theory: A cognitive account of sex typing source. *Psychological Review, 88,* 354-364.

Brannon, R., & Juni, S. (1984). A scale for measuring attitudes about masculinity. *Psychological Documents, 14,* 6-7.

Calasanti, T., Pietilä, I., Ojala, H., & King, N. (2013). Men, bodily control, and health behaviors: The importance of age. *Health Psychology, 32,* 15–23.

Cancer Research UK. (2013). *Inequalities and Ethnicity.* Retrieved from info.cancerresearchuk.org/cancerstats/

Centers for Disease Control and Prevention (2013). *Fact Sheets: Excessive Alcohol Use and Risks to Men's Health.* Retrieved from alcohol ref- www.cdc.gov/alcohol/fact-sheets/mens-health.htm.acesses

Centers for Disease Control and Prevention (2011). Adult cigarette smoking in the United States: Current estimate. Retrieved from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/

Connell, R. W. (1995). *Masculinities.* Cambridge: Polity.

Cosenzo, K. A., Franchina, J. J., Eisler, R. M., & Krebs, D. (2004). Effects of masculine gender-relevant task instructions on men's cardiovascular reactivity and mental arithmetic performance, *Psychology of Men & Masculinity, 5*, 103-111. doi:10.1037/1524-9220.5.2.103

Courtenay, W. H. (2000a). Constructions of masculinity and their influence on men's well being: A theory of gender and health. *Social Science & Medicine, 50,* 1385-1401.

Courtenay, W. H. (2000). Endangering health: A social construct examination of mens health beliefs and behaviors. *Psychology of Men & Masculinity,1*, 4-15.

Craig, C.L., Marshall, A. L., Sjöström, M., Bauman, A.E., Booth, M. L., Ainsworth, B.E., . . . Oja, P. (2003). International physical activity questionnaire (IPAQ): 12-country reliability and validity. *Medicine & Science in Sports and Exercise, 35*, 1381–1391.

Davis, J., McCrae, B. P., Frank, J., Dochnahl, A., Pickering, T., Harrison, B., . . . Wilson, K. (2000). Identifying male collage students perceived health needs, barriers to seeking help, and recommendations to help men adopt healthier lifestyles. *American Journal of Collage Health,(48),* 259-267.

Department of Health. (2007). *Five a day General Information*. Retrieved from http://www.dh.gov.uk/en/Publichealth/Healthimprovement/FiveADay/FiveADaygeneralinformation/DH_4069924.

Department of Health. (2003). *Health Survey for England*. London: The Stationary Office.

De Visser, R. O., & Smith, J. A. (2007a). Alcohol consumption and masculine identity among young men. *Psychology & Health, 22*, 95-614.

De Visser, R.O., & Smith, J. A. (2007b). Young men's ambivalence toward alcohol. *Social Science & Medicine, 64*, 350-362.

De Visser, R.O., & McDonnell, E. J. (2012*).* 'That's OK. He's a guy': a mixed-methods study of gender double-standards for alcohol use. *Psychology and Health, 27*, 618-639.

Emslie, C., Hunt, K., & Lyons. A. (2013). The role of alcohol in forging and maintaining friendships amongst Scottish men in midlife, *Health Psychology, 32,* 33-41.

Emslie, C., Hunt, K., & Watt, G. (2001). Invisible women? The importance of gender in lay beliefs about heart problems. *Sociology of Health & Illness, 23***,** 201-231.

Eisler, R. M., Skidmore, J. R., & Ward, C. H. (1988). Masculine gender role stress: predictor of anger, anxiety, and health risk behaviors. *Journal of Personality Assessment, 52*, 133-141.

Eisler, R. M., & Skidmore, J.R. (1987). Masculine gender role stress. Scale development and component factors in the appraisal of stressful situations. *Behavior Modification, 11*, 123-136.

Field, A. (2005). Discovering statistics using SPSS. London: Sage.

Ford, E. S., Zhao, G., Tsai, J., & Li, C. (2011). Low-risk lifestyle behaviors and all-cause mortality: findings from the National Health and Nutrition Examination Survey III Mortality Study. *American Journal of Public Health, 101*, 1922-1929.

Galdas, P. (2010). The role of masculinities in White and South Asian men's help seeking behavior for cardiac chest pain. In B. Gough. B. & S. Robertson (Eds.), *Men, masculinities & health: Critical perspectives* (pp. 216-231). Basingstoke. Palgrave Macmillan Ltd.

Gillespie, B.L & Eistler, R,M (1992). Development of the feminine gender role stress scale: A cognitive-behavioral measure of stress, appraisal, and coping for women. *Behavior Modification, 16*, 426-438.

Gorman, B. K., & Read, G. J. (2007). Why men die younger than women. *Geriatrics and Aging, 10*, 182-191.

Gough, B. (2007). 'Real men don't diet': An analysis of contemporary newspaper representations of men, food and health. *Social Science & Medicine, 64*, 326-337.

Gough, B & Robertson, S. (2009). *Men, masculinities & health: Critical perspectives*. Basingstoke. Palgrave Macmillan Ltd.

Hamilton., C. J. & Mahalik, J. R. (2009). Minority stress, masculinity, and social norms predicting gay men's health risk behaviors. *Journal of Counseling Psychology, 56*, 132–141.

Helgeson, V. (1995). Masculinity, men's roles, and coronary heart disease. In D. Sabo. & D. F. Gordon (Eds.) *Men's health and Illness: Gender power and the body* (pp. 68-97). California, CA: Sage.

Hunt, K., Hannah, M., & West, P. (2004). Contextualizing smoking: Masculinity, femininity, and class differences in smoking in men and women from three generations in the west of Scotland. *Health Education Research, 19*, 239-249.

Iwamoto, D. K., Corbin, W., Lejuez, C.,& MacPherson, L.(2013). College men and alcohol use: Positive alcohol expectancies as a mediator between distinct masculine norms and alcohol use. *Psychology of Men & Masculinity, 15*, 29-39.

Kimmel, M. (1994). Masculinity and homophobia: Fear, shame and silence in the construction of gender identity. In H. Brod & M. Kaufman (Eds), *Theorizing Masculinities* (pp. 119-141). London. Sage Publications.

Lee, C., & Owens, R. G. (2002). *The psychology of men's health*. Buckingham: Open University Press.

Levant, R., & Pollack, W. (1995). *A new psychology of men*. New York, NY: Basic books.

Mahalik, J. R., Burns, S. M., & Syzdek, M. (2007). Masculinity and perceived normative health behaviors as predictors of men's health behaviors. *Social Science and Medicine, 64*, 2201–2209.

Mahalik, J.R., Levi-Minzi, M. & Walker, G. (2007). Masculinity and health behaviors in Australian men. *Psychology of Men & Masculinity, 8*, 240–249.

Mahalik, J.R., Morray, E.B., Coonerty-Femino, A., Ludlow, L. H., Slattery, S.M. & Smiler, A. (2005). Development of the conformity to feminine norms inventory. *Sex Roles, 52*, 417-453.

Mahalik, J.R., Locke, B., Ludlow, L., Diemer, M., Scott, R.P.J., Gottfried, M., & Freitas, G. (2003). Development of the Conformity to Masculine Norms Inventory. *Psychology of Men and Masculinity*, 4, 3-25.

Mahalik, J.R., Lagan, H., & Morrison, J.A. (2006). Health behaviors and masculinity in Kenyan and U.S. male college students. *Psychology of Men and Masculinity, 7,* 191-202.

Makela, P., Gmel. G., Grittner, U., Kuendig, H., Kuntsche,S., Bloomfield, K., & Room, R. (2006). Drinking patterns and their gender differences in Europe. *Alcohol and Alcoholism,41*,, i8-i18.

Martin-Moreno, J. M., Soerjomataram, I., & Magnusson, G. (2008).Cancer causes and prevention: A condensed appraisal in Europe in 2008. *European Journal of Cancer*, *44*(10), 1390-1403.

Mens Health Forum. (2013). *Are half of England's men binge drinkers* ? Retrieved from http://www.menshealthforum.org.uk/22523-excessive-alcohol-consumption-higher-assumed

Messerschmidt, J.(1993). *Masculinities and crime: Critique and reconceptualisation of theory*. Maryland. Rowman and Littlefield publishers.

McCreary, D.R., Newcombe, M.D., & Sadava, S.W. (1999). The male role, alcohol use, and alcohol problems: A structural modelling examination in adult men and women. *Journal of Counselling Psychology*, *46, 109-124.*

Ming Liu, W. (2005). Masculinity as a multi cultural competency. *Journal of Clinical Psychology, 61*, 685–697.

Monk, D., & Ricciardelli, L. A. (2003). Three dimensions of the male gender role as correlates of alcohol and cannabis involvement in young Australian men, *Psychology of Men and Masculinity, 4*, 57-69.

Morgan, M.Y., & Ritson, E. B. (2003). Alcohol and health: A handbook for students and medical practitioners (4th ed.). London: Medical Council on Alcohol.

Moss-Racusin, C. A., Phelan, J. E., Rudman, L. A. (2010). When men break the gender rules: Status incongruity and backlash against modest men. *Psychology of Men & Masculinity, 11*, 140–151. DOI: 10.1037/a0018093

Moynihan, C. (1998).Theories in health care and research: Theories of masculinity. *British Medical Journal, 317*, 1072-1075.

Office for National Statistics. (2009).*Smoking and drinking among adults 2009: A report on the 2009 General Lifestyle Survey*. Retrieved from http://www.ons.gov.uk/ons/rel/ghs/general-lifestyle-survey/2009-report/index.html

O' Neil, J. M., Helms, B.J., Gable, R. K., David, L. & Wrightesman, L.S. (1986). Gender-role conflict scale: College men's fear of femininity. *Sex Roles, 14*, 335-350.

Robertson, S., & Gough, B. (2010). What next for men's health research? In B. Gough. B. & S. Robertson (Eds.), *Men, masculinities & health: Critical perspectives* (pp. 232-253). Basingstoke. Palgrave Macmillan Ltd.

Roe, L., Strong, C., Whiteside, C., Neil, A., & Mant, D. (1994). Dietary intervention in primary care: Validity of the DINE method for diet assessment. *Family Practice, 11*, 375-381.

Rothgerber, H. (2012). Real men don't eat (vegetable) quiche: Masculinity and the justification of meat consumption. *Psychology of Men & Masculinity*. *14*,, 363-375.

Sloan, C. E., Gough, B., & Conner, M.T. (2010). Healthy masculinities? How ostensibly healthy men talk about lifestyle, health and gender, *Psychology & Health, 25,* 783–803.

Snell, W.E., Belk, S., & Hawkins, R.C. (1987). Alcohol and drug use in stressful times: The influence of the masculine role and sex-related personality attributes. *Sex Roles, 16,*, 359-373.

Spence, J.T., Helmreich, R. L., & Holahan, C.K. (1979). Negative and positive components of psychological masculinity and femininity and their relationships to self-reports of neurotic and acting out behaviors. *Journal of Personality and Social Psychology*, *37*, 1673–1682.

Spence, J.T., & Helmreich, R.L. (1978). *Masculinity and femininity. Their psychological dimensions, correlates and antecedents*. Austin, TX: University of Texas Press.

Tannenbaum, C., & Frank, B. (2011). Masculinity and Health in Late Life Men. *American Journal of Men's Health*, *5*,243–254.

Thompson, E.H., & Pleck, J.H. (1986). The structure of male role norms. *American Behavioral Scientist, 29*, 531–543.

Townsend, N., Wickramasinghe., K, Bhatnagar, P., Smolina K., Nichols, M., Leal, J. . . & Rayner, M. (2012). *Coronary heart disease statistics 2012 edition.* London: British Heart Foundation

Wardle, J., Haase, A.M., Steptoe, A., Nillapun, M., Jonwutiwes, K., & Bellisle, F. (2004). Gender difference in food choice: The contribution of health beliefs and dieting. *Annals of Behavioral Medicine, 27*, 107-116.

White, A. (2007). *Why focus on men's health: a case of 'gender duty'*. Retrieved from http://www.idea.gov.uk/idk/core/page.do?pageId=5933498

Willams, R. (2013, March 10). Gender differences in smoking could impact quitting. *Scotland on Sunday.* Retrieved from http://www.scotsman.com/scotland-on-sunday/scotland/gender-differences-in-smoking-could-impact-quitting-1-2828825

World Health Organization. (2012). *The European health report 2012: Charting the way to well-being.* Retrieved from: http://www.euro.who.int/data/assets/pdf_file/0003/184161/The-European-Health-Report-2012,-FULL-REPORT-w-cover.pdf

Table 1. Masculinity Scale Factors and Health Behaviours for Men and Women.

Masculinity Scale Factors	**Mean (SD) Men**	**Mean (SD) Women**	***P***
MGRSS 1: Physical Inadequacy	3.01 (1.03)	2.68 (0.82)	**
MGRSS 2: Emotion Inexpressiveness	2.74 (1.04)	2.80 (1.04)	
MGRSS 3: Intellectual Inferiority	1.91 (0.92)	1.67 (0.70)	**
MGRSS 4: Performance Failure	2.44 (0.99)	2.47 (0.95)	
MGRSS 5: Subordination to Women	4.61 (1.35)	4.75 (1.23)	
MRNS 1: Status	3.49 (1.16)	3.26 (1.12)	
MRNS 2: Toughness	3.05 (1.19)	2.38 (0.96)	**
MRNS 3: Antifeminity	2.82 (1.26)	2.59 (1.14)	
EPAQ 1: Agency	3.57 (0.57)	3.36 (0.57)	**
EPAQ 2: Unmitigated Agency	3.87 (*0.51)*	4.03 (0.49)	*
EPAQ 3: Communion	2.54 (0.59)	2.37 (0.55)	**
Health Behaviors			
Positive Health Behavior Index (PHBI)	0.37 (2.39)	-0.11 (2.16)	
Unsaturated Fat	3.15 (0.62)	3.20 (0.61)	
Dietary Fiber	35.93 (13.56)	32.18 (12.61)	**
Physical Activity	3.32 (0.48)	3.13 (0.45)	**
Fruit Consumption	3.67 (1.09)	3.89 (1.02)	
Negative Health Behaviour Index (NHB	0.52 (2.11)	-0.36 (1.66)	**
Saturated Fat	5.22 (1.05)	4.72 (0.85)	**
Smoking Status	0.24 (0.43	0.21 (0.41)	
Alcohol Consumption	1.28 (0.45)	1.16 (0.37)	*

Note: * $p < 0.05$, **$p < 0$ .01. F values for masculinity scale gender differences are reported in the text. Statistical values for health behavior variables are reported with the regression analysis in Table 4.

Table 2. Partial Correlations Between Masculinity Scales by Gender, Controlling for the Effects of Age, Education and Ethnicity. Above Diagonal Results for Women, Below Diagonal Results for Men.

Men	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Women
1. Physical Inadequacy	-	.29**	.44**	.44**	.47**	.21**	.12	.22**	-.10	-.05	-.09	1.
2. Emotion Inexpressiveness	.48**	-	.31**	.59**	.36**	.15*	.18**	.15*	-.30**	-.03	-.09	2.
3. Intellectual Inferiority	.42**	.38**	-	.53**	.21**	.32**	.27**	.24**	-.12	.06	-.24**	3.
4. Performance Failure	.59**	.58**	.43**	-	.47**	.25**	.23**	.15*	-.19**	.05	-.17*	4.
5. Subordination to Women	.63**	.41**	.34**	.49**	-	.04	-.03	.05	-.10	-.05	-.01	5.
6. Status	.23**	.26**	.29**	.12	.02	-	.60**	.39**	-.05	.17*	-.13	6.
7. Toughness	.20**	.26**	.34**	.19*	.03	.54**	-	.54**	-.08	.21**	-.21**	7.
8. Anti-feminity	.19*	.40**	.32**	.30**	.07	.28**	.44**	-	.01	.02	-.08	8.
9. Agency	-.12	-.24**	-.10	-.25**	-.07	.04	.10	-.04	-	.16*	-.00	9.
10.Unmitigated Agency	-.08	-.08	.09	.02	-.10	-.06	-.02	-.02	-.00	-	-.40**	10.
11.Comunion	-.08	-.27**	-.17*	-.20**	.02	.09	-.04	-.27**	.29**	-.23**	-	11.

Note: **p < 0 .01, * p < 0.05. *Key:* Masculine Gender Roles Stress Scale (MGRSS):1. MGRSS Factor 1: *Physical inadequacy;* 2. MGRSS Factor 2*: Emotional Inexpressiveness;* 3. MGRSS Factor 3*:Intellectual Inferiority;* 4. MGRSS Factor 4 *:Performance failure;* 5. MGRSS Factor *5 :Subordination to women.* Male Role Norms Scale (MRNS): 6. MRNS Factor 1: *Status*; 7. MRNS Factor 2: *Toughness*; 8. MRNS Factor 3: *Anti-Femininity*. Extended Personal Attributes Questionnaire (EPAQ): 9. EPAQ Factor 1: *Agency;* 10. EPAQ Factor 2: *Unmitigated Agency*; 11. EPAQ Factor 3: *Communion.*

Table 3. Partial Correlations Between Masculinity Scales and Health Behaviours for Men and Women Controlling for the Effects of Age, Ethnicity and Education.

Masculinity scales	PHBI	Unsaturated Fat	Fiber	Physical Activity	Fruit	NHBI	Saturated Fat	Smoking	Alcohol
Results for men									
1. Physical Inadequacy	.06	-.02	.19*	-.08	.06	.16	.13	.03	.12
2. Emotional Inexpressivenes	-.02	.02	.08	-.07	-.10	.13	.13	-.01	.12
3. Intellectual Inferiority	-.16	-.01	-.10	-.07	-.19*	.23**	.23**	.04	.16
4. Performance Failure	-.05	.10	.05	-.27**	-.01	.00	.10	-.05	-.05
5. Subordination to Women	-.05	-.02	.13	-.20**	-.01	.06	.06	-.00	.05
6. Status	.00	-.05	.03	.13	-.11	.17*	.15	-.00	.16
7. Toughness	-.20*	-.21*	-.09	.11	-.31**	.32**	.33**	.11	.16
8. Anti-feminity	-.10	-.07	-.05	.04	-.17*	.15	.11	.09	.08
9. Agency	.02	-.06	-.14	.20*	.03	-.02	-.21*	.14	.04
10.Unmitgated Agency	-.09	-.04	-.04	-.10	-.01	.03	.16	-.09	-.02
11.Communion	.09	.03	-.00	.07	.13	-.03	-.16	.05	.05
Results for women									
1. Physical Inadequacy	-.00	-.12	.11	.05	-.04	.15*	.17*	.04	.06
2. Emotional Inexpressivenes	-.04	-.06	.07	-.05	-.05	.14*	.28**	.00	.00
3. Intellectual Inferiority	.05	-.01	.06	.05	.02	.01	.15*	-.03	-.08
4. Performance Failure	-.03	-.03	.12	-.14*	-.00	.14*	.24**	.01	.02
5. Subordination to Women	-.04	-.04	.10	-.04	-.10	.26**	.26**	.10	.12
6. Status	.00	.03	.02	.02	-.06	-.01	-.03	-.09	.09
7. Toughness	-.06	-.07	.02	-.05	-.02	.07	.01	.00	.12
8. Anti-femininity	-.06	-.01	-.02	-.09	-.02	.05	.06	.01	.03
9. Agency	.09	.00	.02	.08	.11	-.06	-.10	-.08	.06
10.Unmitigated Agency	-.00	-.10	.01	.06	.02	-.01	-.02	-.00	-.00
11.Communion	-.02	.14*	-.07	-.03	-.09	-.04	-.03	.01	-.05

Note: **p < 0 .01, * p < 0.05. *Key:* Masculine Gender Roles Stress Scale (MGRSS):1. MGRSS Factor 1: *Physical inadequacy;* 2. MGRSS Factor 2*: Emotional Inexpressiveness;* 3. MGRSS Factor 3*:Intellectual Inferiority;* 4. MGRSS Factor 4 *:Performance failure;* 5. MGRSS Factor *5 :Subordination to women.* Male Role Norms Scale (MRNS): 6. MRNS Factor 1: *Status*; 7. MRNS Factor 2: *Toughness*; 8. MRNS Factor 3: *Anti-Femininity*. Extended Personal Attributes Questionnaire (EPAQ): 9. EPAQ Factor 1: *Agency;* 10. EPAQ Factor 2: *Unmitigated Agency*; 11. EPAQ Factor 3: *Communion.*

Table 4. Regression Results for the PHBI, NHBI and Individual Health Behaviors

Independent Variables	PHBI		Unsaturated Fat		Fiber		Physical Activity		Fruit		NHBI		Saturated Fat		Smoking		Alcohol	
	B (SE)	ß	B (SE)	ß	B (SE)	ß	B (SE)	ß	B (SE)	ß	B (SE)	ß	B (SE)	ß	B (SE)	Exp(B)	B (SE)	Exp(B)
Age	0.02(0.01)	0.09	-0.00(0.00)	-0.03	0.25(0.05)	0.23**	-0.01(0.00)	-0.16**	0.02(0.00)	0.23**	-0.02(0.01)	-0.16**	-0.00(0.00)	-0.03	-0.02(0.01)	0.97	-0.04(0.01)	0.96**
Education	0.28(0.25)	0.06	-0.05(0.06)	-0.04	3.01(1.30)	0.12*	-0.06(0.05)	-0.06	0.21(0.10)	0.10*	-0.50(0.19)	-0.13**	-0.14(0.10)	-0.07	-0.64(0.28)	0.52*	-0.26(0.28)	0.76
Ethnicity	-0.02(0.42)	-0.00	0.03(0.10)	0.02	-1.25(2.09)	-0.03	-0.06(0.08)	-0.04	0.13(0.17)	0.04	-0.22(0.32)	-0.03	0.08(0.15)	0.03	0.65(0.41)	1.93	-1.88(0.67)	0.15**
Gender	0.51(0.27)	0.11	0.04(0.07)	0.03	3.90(1.39)	0.15**	0.15(0.06)	0.15**	-0.21(0.11)	-0.10	0.67(0.20)	0.17**	0.44(0.10)	0.22**	-0.01(0.30)	0.99	0.58(0.30)	1.76*
1. Physical Inad	0.26(0.18)	0.10	-0.05(0.05)	-0.07	1.55(0.20)	0.11	0.06(0.04)	0.11	0.09(0.07)	0.08	0.06(0.14)	0.03	-0.00(0.07)	-0.06	-0.00(0.19)	0.99	0.11(0.20)	1.11
2. Emotion Inexp	0.04(0.15)	0.01	-0.10(0.04)	-0.01	0.27(0.77)	0.02	0.04(0.03)	0.09	-0.02(0.06)	-0.02	0.14(0.11)	0.07	0.12(0.06)	0.13*	-0.03(0.16)	0.96	0.08(0.16)	1.08
3. Intellectual Inf	-0.02(0.20)	-0.01	-0.06(0.05)	-0.08	-2.05(0.99)	-0.13*	0.05(0.04)	0.08	-0.11(0.08)	-0.08	0.22(0.15)	0.10	0.16(0.07)	0.14*	0.21 (0.20)	1.24	-0.03(0.21)	0.97
4. Perf Failure	-0.01(0.18)	-0.00	0.10(0.04)	0.15*	0.89(0.90)	0.07	-0.14(0.04)	-0.28**	0.11(0.07)	0.11	-0.29(0.14)	-0.15*	-0.01(0.06)	-0.02	-0.36(0.19)	0.69	-0.33(0.19)	0.71
5. Sub to Wom	-0.17(0.12)	-0.09	-0.03(0.03)	-0.06	0.21(0.62)	0.02	-0.03(0.02)	-0.08	-0.09(0.05)	-0.11	0.21(0.09)	0.14*	0.05(0.05)	0.06	0.19(0.13)	1.21	0.21(0.14)	1.13
6. Status	0.22(0.14)	0.11	0.07(0.04)	0.12	0.71(0.70)	0.06	0.03(0.03)	0.08	0.00(0.06)	0.00	-0.12(0.10)	-0.07	-0.09(0.05)	-0.10	-0.24(0.15)	0.78	0.22(0.16)	1.24
7. Toughness	-0.39(0.16)	-0.18*	-0.12(0.04)	-0.23**	-0.86(0.80)	-0.07	0.00(0.03)	0.00	-0.16(0.07)	-0.17*	0.43(0.12)	0.25**	0.19(0.06)	0.22**	0.24(0.17)	1.28	0.29(0.17)	1.34
8. Antifeminity	-0.12(0.13)	-0.06	0.13(0.03)	0.02	-0.94(0.66)	-0.08	-0.04(0.03)	-0.09	-0.06(0.05)	-0.07	0.04(0.10)	0.03	-0.02(0.05)	-0.03	0.22(0.14)	1.25	-0.03(0.14)	0.96
9. Agency	0.34(0.23)	0.09	-0.04(0.06)	-0.04	-0.32(1.16)	-0.01	0.11(0.05)	0.13*	0.12(0.09)	0.07	-0.03(0.17)	-0.01	-0.10(0.08)	-0.06	-0.06(0.25)	0.93	0.22(0.26)	1.24
10.Unmit Ag	- 0.23(0.24)	-0.06	-0.03(0.06)	-0.03	-1.28(1.21)	-0.06	-0.04(0.05)	-0.04	-0.02(0.10)	-0.01	0.01(0.18)	0.00	0.08(0.09)	0.05	-0.09(0.26)	0.90	-0.13(0.26)	0.87
11 Communion	- 0.11(0.27)	-0.03	0.06(0.07)	0.04	-1.97(1.39)	-0.07	-0.04(0.05)	-0.05	-0.08(0.11)	-0.04	0.08(0.20)	0.02	0.01(0.10)	0.01	0.37(0.30)	1.40	-0.18(0.30)	0.82

Note: **p < 0 .01, * p < 0.05. B (SE) and Exp(B) are reported for smoking and alcohol dependent variables as these are dichotomous variables and logistical regression was used for analysis. *Key:* Masculine Gender Roles Stress Scale (MGRSS):1. MGRSS Factor 1: *Physical inadequacy;* 2. MGRSS Factor 2*: Emotional Inexpressiveness;* 3. MGRSS Factor 3*:Intellectual Inferiority;* 4. MGRSS Factor 4 *:Performance failure;* 5. MGRSS Factor *5 :Subordination to women.* Male Role Norms Scale (MRNS): 6. MRNS Factor 1: *Status*; 7. MRNS Factor 2: *Toughness*; 8. MRNS Factor 3: *Anti-Femininity*. Extended Personal Attributes Questionnaire (EPAQ): 9. EPAQ Factor 1: *Agency;* 10. EPAQ Factor 2: *Unmitigated Agency*; 11. EPAQ Factor 3: *Communion.*