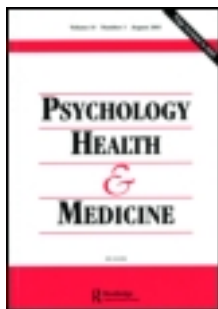


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Who makes use of Internet-delivered health information? The role of gender role self-concept in young men and women

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Who makes use of Internet-delivered health information? The role of gender role self-concept in young men and women

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This study examined the contribution of gender role self-concept (expressiveness and instrumentality) on active interest in and use of Internet-delivered health information among young men and women. Four hundred and twenty university students reported health behaviours and perceived personal vulnerability regarding five diseases. We analysed active interest in receiving health-related information concerning these diseases (providing email address to receive a link to health-related websites) and actual use of provided websites two weeks afterwards. Usage of health-related information via the Internet was objectively assessed by recording log-ins on the website and obtaining individual click counts. In both sexes, higher expressiveness was independently associated with being more likely to show active interest in health-related information. Additionally, expressiveness was positively associated with website use in men independent of age, personal vulnerability and reported health behaviours. Thus, an expressive self-concept facilitates the use of health-related information, especially among men.

Keywords: gender role self-concept; expressiveness; instrumentality; health information; Internet

The worldwide web has become an important source of health-related information (Fox, 2008; Kivits, 2006), particularly among young adults (Hesse et al., 2005). Internet-delivered health information appears to be accessed less often by men than by women (Czajka, 2011; Escoffery et al., 2005; Hesse et al., 2005), but not much is known about the factors that account for this difference.

It has been suggested that not biological sex, but a person's gender role self-concept (GR-SC), i.e. a person's identification with personal attributes that are seen as appropriate for a typical man or woman in a given society, contributes to the adoption of health-related behaviours (Courtenay, 2000; Sieverding, 2000, 2002). Masculine or instrumental attributes include independence, self-reliance and willingness to take risks; whereas, feminine or expressive attributes include understanding, warm-heartedness and tenderness (Spence & Helmreich, 1978).

While instrumentality has been linked to an increased tendency towards risky behaviours (Sieverding, 2004), expressiveness appears to be related to health-protective attitudes and behaviours, particularly in males (Raithel, 2003; Zimmermann, Sieverding, &

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Müller, 2011). Whether an expressive GR-SC also promotes seeking health information via the Internet in men and women is currently unknown.

The aim of this study was to investigate whether GR-SC can account for differences in interest and use of Internet-based health-related information in young men and women. We hypothesized that individuals with high expressiveness are (1) more interested in and (2) make more use of Internet-delivered health-related information compared to individuals low in expressiveness. Furthermore, we explored if these relationships are moderated by sex.

Methods

Participants and procedures

We approached 420 German university students from varying disciplines in class. They received the questionnaires, which included vulnerability estimates regarding myocardial infarction, skin cancer, breast cancer/testicle cancer, colon cancer and depression. At the end of the questionnaire, participants had the option to provide their email address to receive additional information concerning prevention of these five diseases. Consenting participants received an email with the URL to the study's websites 14 days after completing the questionnaire. These websites consisted of a homepage listing all five diseases plus two topics on primary prevention. Each topic was a link to an additional website that presented links to third party websites (e.g. Deutsche Krebshilfe/German Cancer Aid). Overall, the study websites provided 36 links. Clicks on these links were counted. Two months after sending the last email, the study website was taken offline. The study was carried out in accordance with APA ethical principles.

Measures

GR-SC was assessed applying the German version of the Personal Attributes Questionnaire (PAQ; Runge, Frey, Gollwitzer, Helmreich, & Spence, 1981). Participants rated how well expressive and instrumental attributes described themselves on a scale from 0 (not at all) to 4 (very much so). Responses were summed and scores divided by the number of items. Internal consistencies were $\alpha = .70$ for instrumentality and $.72$ for expressiveness.

Self-reported health behaviour was measured via the health practices index (HPI; Steptoe, Wardle, Vinck, & Tuomisto, 1994), which lists 16 health practices (e.g. regular exercise, being a non-smoker). Regular self-examination of skin and moles was added (Spaderna, 2004). Participants had to indicate whether or not they performed each health practice, yielding scores between 0 and 17.

Perceived personal vulnerability was rated for each of the five diseases and estimates were averaged (Cronbach's $\alpha = .73$). Response options ranged from 0% (no risk of developing the disease) to 100% (will develop the disease in any case).

Active interest in receiving health information (Sieverding, Decker, & Zimmermann, 2010) was coded "1", if participants chose the response option "NO, I'm not interested in receiving any information because I'm not interested in these topics", "2" if they chose "NO, I'm not interested in receiving any information since I am already well informed" and "3" for "YES, I'm interested in receiving information" plus providing an email address.

Website use 14 days after questionnaire completion was coded “0” (no log-in due to non-responding or because no email address had been provided) or “1”. Additionally, click counts were registered (log-in as first click).

Data analyses

To investigate associations of GR-SC variables with active interest (aim 1), and with website use and click count (aim 2), a stepwise multi-nomial logistic regression and a logistic and linear regression, respectively, were applied. All two-way-interactions of GR-SC variables and sex were examined (see tables for details). Analyses were conducted using SPSS (19.0).

Results

Sex differences among study variables are displayed in Table 1. A comparable proportion of men and women provided their email address ($\chi^2(1) = .69, p = .429$). Of the 176 persons indicating active interest in receiving information, 63 (35.8%; men: 36.4%, women: 34.1%, $\chi^2(1) = .10, p = .875$) used the provided link and clicked 1–17 times ($M = 6, SD = 3.7$).

In multi-variate analysis of active interest, the effect of female sex, which emerged in the first step, became insignificant after entering the GR-SC variables in the third step (Table 2). Expressiveness was significantly and independently related to the choice of the response options. Thus, for a 23-year old with average instrumentality and vulnerability, who engaged in 11 health behaviours, the probability to choose “Yes, I’m interested” relative to the reference category “No, I’m not interested” increased by 2.30 with

Table 1. Sample characteristics by participant sex.

	Men (<i>n</i> = 200)		Women (<i>n</i> = 220)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age	22.97	3.60	23.42	3.98	.265
Expressiveness	3.66	.52	3.95	.45	<.0001
Instrumentality	3.48	.57	3.32	.56	.005
Personal vulnerability ^a	18.43	13.72	20.60	14.49	.114
HPI	10.25	2.23	11.36	1.92	<.0001
Active interest in receiving additional health-related information (<i>n</i>) ^b					.011
No, not interested	36	18.00%	20	9.10%	
No, already informed	65	32.50%	100	45.50%	
Yes, interested	88	44.00%	88	40.00%	
Number of website users (<i>n</i>)					.416
No	167	83.50%	190	86.40%	
Yes	33	16.50%	30	13.60%	
Click count ^c	2.50	3.98	1.67	3.13	.357

Notes: HPI, Health Practices Index. Age, instrumentality, expressiveness, HPI, and personal vulnerability were not-normally distributed. Men and women were compared using the χ^2 test, Fisher’s exact test, or Mann–Whitney *U*-test, as appropriate.

^a*N* = 413 due to seven participants with missing values.

^bResponses to this item were missing in 11 men (5.5%) and 12 women (5.5%).

^cAmong the *n* = 176 participants who provided their email address.

Table 2. Associations of sex and GR-SC variables with categories of active interest in receiving health-related information independent of age, personal vulnerability, and health practices.

	Overall effect ^a		“NO, I’m already well informed”		“YES, I’m interested in receiving the email” + email address	
	$\Delta\chi^2(2)$	<i>p</i>	RRR(2)	95% CI	RRR(3)	95% CI
1. Age	6.59	.037	1.02	(.92–1.12)	1.09	(.99–1.19)
Female sex	11.40	.003	2.75	(1.46–5.17)	1.72	(.92–3.21)
1. Age	6.79	.034	1.01	(.91–1.12)	1.08	(.98–1.20)
Female sex	6.18	.046	2.12	(1.07–4.21)	1.38	(.70–2.73)
2. Personal vulnerability	3.47	.177	1.00	(.98–1.03)	1.02	(.99–1.04)
HPI	13.56	.001	1.33	(1.13–1.56)	1.30	(1.11–1.52)
1. Age	5.70	.058	.99	(.90–1.10)	1.07	(.96–1.18)
Female sex	4.29	.117	1.70	(.83–3.49)	1.07	(.52–2.20)
2. Personal vulnerability	3.24	.198	1.00	(.98–1.03)	1.02	(.99–1.04)
HPI	13.17	.001	1.33	(1.13–1.57)	1.30	(1.11–1.53)
3. Instrumentality	.65	.724	.78	(.43–1.43)	.83	(.46–1.50)
Expressiveness	6.50	.039	1.95	(1.02–3.72)	2.30	(1.20–4.39)

Notes: Reference category 1 = “NO, I’m not interested in receiving additional health information because I’m not interested in these topics”. GR-SC, gender role self-concept. RRR(2), relative-risk ratio comparing category 2 against the reference category. RRR(3), relative-risk ratio comparing category 3 against the reference category. CI, confidence interval. HPI, health practice index. Instrum, instrumentality. Express, expressiveness. Sex is coded 0 for men and 1 for women. *N* = 390 due to missing values for 30 participants (23 with missing data in active interest, 7 with missing data in personal vulnerability). Nagelkerke’s Pseudo-*R*² = .12. Interaction terms of sex and GR-SC variables were negligible (all *p*-values > .268). Significant effects in bold.

^aReductions of the –2 log Likelihood ($\Delta\chi^2$).

a one-unit increase in expressiveness (*p* = .012). For the same individual, the chance to choose “No, I’m already well informed” relative to the reference category increased by 1.95 (*p* = .044).

Table 3. Logistic regression of website use (yes/no) on sex, GR-SC variables and their interactions, controlling for age, personal vulnerability, and health behaviours.

	Website use ^a		
	OR	95% CI	<i>p</i>
1. Age	1.06	(.99–1.13)	.107
Female sex	.69	(.38–1.24)	.211
2. Personal vulnerability	1.07	(1.03–1.11)	<.001
HPI	1.10	(.96–1.26)	.158
3. Instrumentality	1.27	(.62–2.61)	.511
Expressiveness	1.97	(.81–4.78)	.133
4. Sex × instrum	1.55	(.57–4.18)	.389
Sex × express	.24	(.07–.82)	.023
Instrum × express	.89	(.31–2.60)	.836
Const.	.21		<.001

Notes: GR-SC, gender role self-concept. OR, odds ratio. CI, confidence interval. HPI, Health Practice Index. Instrum, instrumentality. Express, expressiveness. Sex is coded 0 for men and 1 for women.

^a*N* = 63 participants among the 176 who had provided their email address logged in on the study website. Nagelkerke’s *R*² = .10. The 3-way interaction of sex, expressiveness, and instrumentality was negligible (*p* > .72).

For website use (no/yes), a significant interaction of sex \times expressiveness (Table 3) emerged. Tests of simple slopes indicated that higher expressiveness in men was associated with higher odds to use the websites, although this did not reach the conventional level of statistical significance (OR = 2.02, 95% CI .83 – 4.92, $p = .123$). In women, higher expressiveness tended to be associated with lower odds to use the websites (OR = .49, 95% CI .21 – 1.15, $p = .10$). The sex \times expressiveness interaction was also significant when the continuous variable *click count* among the 176 participants who had provided their email address was analysed ($b = -3.52$, $SE(b) = 1.37$, $p = .011$). In men, a one-unit increase in expressiveness was associated with two more clicks ($b = 1.98$, $SE(b) = 1.01$, $p = .051$); in women this tended to be associated with fewer clicks ($b = -1.54$, $SE(b) = .89$, $p = .084$).

Discussion

In this study of young adults, an expressive self-concept, rather than female sex, was associated with active interest in using the Internet as a resource for health-related information. Regarding the behaviour of accessing the websites and clicking the provided links, expressiveness was particularly relevant for men. The observed associations were independent of age, health behaviour, personal vulnerability and instrumentality. These findings are in line with results from a study that reported that higher expressiveness was associated with reduced mortality from coronary heart disease in men during a 17-year follow-up (controlling for traditional risk factors), but not in women (Hunt, Lewars, Emslie, & Batty, 2007). A more expressive self-concept might in part assert its beneficial effect on men's health indirectly via promoting healthy behaviours such as information seeking on the Internet or "buffering" against risky behaviours inherent in the traditional male role. Additional studies are needed to test these hypotheses directly. Also, whether an expressive self-concept is a characteristic for men who describe themselves as adopting a healthy lifestyle (Sloan, Gough, & Conner, 2010), deserves further attention.

In our study, men and women were equally likely to provide their email address and to use the provided links, which is in contrast to reports of others (Brouwer et al., 2010; Czajka, 2011; Escoffery et al., 2005; Ybarra & Suman, 2008), but women were more likely than men to be already well informed about the health topics. However, when GR-SC was also taken into account, female sex lost its impact. Thus, our findings give additional evidence for the notion that it is not the sex difference per se, but variations in GR-SC that account for differences in health-related behaviours (Courtenay, 2000; Sieverding, 2000).

Our study has several limitations. Firstly, only a selection of diseases was addressed, and some of these might be regarded as being of minor relevance for young adults. However, only 13% of the participants reported to be not interested. Secondly, clicks on third party websites were not registered to avoid counting irrelevant clicks. A particular strength of the present study is the fact that it assessed behaviour (providing email address, logging in, click count) instead of relying on self-reports. Replication is nevertheless reasonable, since our findings might overestimate true associations due to multiple testing. Finally, only university students were enrolled. It is conceivable that our results might not generalize to young people with lower education or working class men and women (Dolan, 2011). Future studies are needed to better understand the relationship of GR-SC with seeking health-related information via the Internet in varying social classes.

In summary, our results support the notion that expressive gender role characteristics contribute to health-related behaviours such as information seeking via the Internet, particularly in men. Thus, GR-SC, and not only biological sex, should be considered for future efforts to increase the effectiveness of online health-information.

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