Do physical activity beliefs differ by age and gender?

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Running Head: Age, Gender and Physical Activity

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Abstract

Age and gender are consistently related to PA, yet theoretical explanation for these associations is scant. The present study compared the mean values and correlations of a population sample, divided by age groups and gender, on theory of planned behaviour (behavioural, normative, and control) beliefs and PA. Participants were a sample (N= 6,739) of adults (M age = 49.65, SD = 16.04) who completed measures of socio- and health- demographics, theory of planned behaviour beliefs, and self-reported PA. Mean analyses identified greater perceived control over PA for seniors than young and middle-aged adults ($\eta^2 > .025$). Belief-behaviour correlations, however, were not different across age and gender in 24/26 tests ($q < .19$). Thus, PA beliefs are invariant across age and gender with the exception of mean levels of perceived control, which are lower among younger adults than older adults. Factors such as early parenthood and career demands were considered the likely reasons for differences. Overall, the evidence suggests that adapting theoretical models for specific age groups or based on gender may not be necessary.

Key Words: Theory of Planned Behaviour, Attitudes, Subjective Norm, Perceived Behavioural Control, Exercise

Do Physical Activity Beliefs Differ by Age and Gender?

The health benefits of regular physical activity (PA) are well-established (Warburton, Nicol, & Bredin, 2006), but the majority of people are not active enough to procure these benefits (U.S. Department of Health and Human Services, 1996a). Although age and gender are consistently related to PA, theoretical explanation for these associations is scant and warrants investigation. An understanding of PA is probably best facilitated through theory-based research and a leading predictive model for understanding PA is theory of planned behaviour (TPB) (Symons Downs & Hausenblas, 2005b). The TPB proposes that the foundation of motivation for a behaviour resides within behavioural (e.g., PA is good for my appearance), normative (e.g., my family would approve of me being active), and control (e.g., limited access to recreation facilities will make it difficult for me to be active) beliefs associated with a behaviour. These beliefs, in turn, are hypothesized to comprise attitudes (i.e., evaluation of a behaviour), subjective norms (i.e., perceived approval from others), and perceptions of control (i.e., perception of ability to perform the behaviour) respectively in their aggregate form, which influence behaviour primarily via intention (Ajzen, 1991).

To date, the most thorough analyses of age and gender as potential moderators of PA have been conducted using the TPB. Although both studies indicated no gender differences were present regarding TPB-intention relationships (Wankel & Mummery, 1993; Wankel, Mummery, Stephens, & Craig, 1994), small age discrepancies were noted, particularly between adolescents and older adults. Still, no convincing differences among adults 20+ were identified with the one exception that mean levels of perceived behavioural control were higher with older groups ($d > .45$). Therefore, the paucity of research notwithstanding, some limitations of the Wankel et al. (1993; 1994) papers warrant continued research. First, the studies focused on behavioural intention as the outcome variable. Because behavioural intention is only related modestly to PA (Symons Downs & Hausenblas, 2005b), it cannot be considered an appropriate outcome variable for understanding

behaviour itself. Second, these studies focused largely on general or direct TPB measures of attitude, subjective norm and perceived behavioural control. Although these are sufficient for TPB model testing, they may lack the measurement precision to differentiate between population groups.

The present study compared the mean values and correlations of a U.S. population sample, grouped by age groups and gender, on behavioural, normative, and control beliefs and PA. It was hypothesized that no age and gender differences would emerge based on the lone study to formally evaluate these factors in the TPB framework (Wankel & Mummery, 1993; Wankel et al., 1994).

Method

Participants and Procedure

A national U.S. mail-out survey was conducted via a hired vendor, MarketFacts, in 2001 for a 3-month period. MarketFacts has a mail panel database of approximately 500,000 people who agree to answer surveys in return for small gifts. For this study, 12,000 respondents stratified by region, household size, income, age of respondent, and population density were mailed a survey and 6,739 completed surveys were returned (56% response rate). The study received institutional approval for the protocol and informed consent was obtained from participants. The current study reflects a secondary data analysis from two prior studies using these data (Blanchard et al., 2005; Rhodes & Blanchard, 2007). For a more detailed discussion of these procedures and descriptives, please see these prior papers.

Measures

TPB Beliefs were chosen based on a systematic review by Symons Downs and Hausenblas (2005a). TPB beliefs that had been elicited in at least 20% of past studies were used to capture the vast majority of possible constructs (see Tables 1 & 2 for beliefs used). Only expectancy type beliefs were included for the sake of questionnaire brevity and based on results demonstrating limited additional utility of including the value component (Gagne & Godin, 2000). Behavioural beliefs were asked using a five-point Likert type scale from 1 (not at all likely) to 5 (very likely),

and normative and control beliefs were asked on seven-point scales from 1 (doesn't influence me at all) to 7 (influences me a lot). Internal consistencies of the aggregate behavioural (α = .90), normative (α = .80), and control (α = .73) beliefs were acceptable. PA was defined using the moderate intensity, frequency, and duration criteria advocated by the CDC position stand on recommended PA (U.S. Department of Health and Human Services, 1996b). PA was measured using items modified from the behavioural risk factor surveillance survey (CDC, 2001). Participants reported their frequency of days performing moderate and vigorous activities 30 min or more per day. Moderate and strenuous intensity categories were then aggregated to produce a total frequency score to resemble CDC recommendations (U.S. Department of Health and Human Services, 1996b) and correspond with the phrasing of the other questions.

Analysis

The treatment of TPB beliefs included an evaluation of the respective aggregate (to represent attitude, subjective norm, and perceived control), a multivariate R of these aggregates, and each individual belief. The aggregate has a tendency to account for 80% or more of the common variance with PA, but unique variance of specific beliefs is still often present (Rhodes, Plotnikoff, & Spence, 2004) and it may be this unique variance that differentiates populations (Fishbein, Von Haeften, & Appleyard, 2001). Global assessments of attitude, subjective norm, and perceived behavioural control were not included because they are measurement redundant with the composite beliefs according to TPB theory (Ajzen, 1991). We also did not examine belief-intention relations as this has been criticized for being misleading because beliefs can correlate with intention, but not behaviour (Sutton, 2002; Weinstein, 2007).

Participant groups were created by gender and age over ten year periods, with the exception of 18-24 and 75+ categorizations. This categorization is somewhat arbitrary, but it created a distribution through each decade. To compare means across groups, we used univariate analyses of

covariance (covariates = education, employment status, income, marital status, and co-morbidities for heart disease, diabetes, arthritis, and cancer) to adjust for other related correlates that may also be associated with PA. Differences among correlations were evaluated using the χ^2 test for independent correlations (Glass & Hopkins, 1996). Correlations included were actually partial correlations after controlling for the above noted covariates. P levels for all tests were set at $p < .01$. The large groups in the sample necessitated an additional criterion for meaningfulness in differences beyond standard Fisherian probability levels. We chose an effect size ($\eta^2 = 0.025$; $d > .34$; $q > .19$) between Cohen's (1992) small and medium estimates because it represents at least a small effect removed from the borderline trivial estimates at the bottom of the small range. This is considered an acceptable cut-off for meaningfulness in public health (Rutledge & Loh, 2004).

Results

Descriptives and mean difference analyses for age and gender can be found in Table 1. Overall, no meaningful differences across groups were found for any of the normative or behavioural beliefs ($\eta^2 < 0.025$). By contrast, the aggregate control beliefs differed across groups ($\eta^2 > 0.024$). Specifically, males aged 18-54 and females aged 18-64 reported less control over PA (i.e., more barriers) than males 55+ and females 65+ ($d > .34$) (see Table 3). Control beliefs of fatigue, lack of time, cost, and lack of social support also had significant differences by age and gender ($\eta^2 > 0.024$). These specific control beliefs generally mimicked the aggregate measure and showed that younger adults perceive less control than older adults, and that younger women particularly report less control than older men (see Table 3).

Comparisons of belief-behaviour correlations across age and gender are presented in Table 2. Only two differences among correlations in 26 tests were found across the groups ($p < .01$; $q > .19$). Specifically, the behavioural belief about PA improving daily functioning had a lower correlation with PA for males aged 18-24 than males aged 25+ and all females (see Table 4). Also,

males aged 25-34 had a larger lack of time-PA correlation than males 18-24, males aged 75+, and females aged 55-64 and 75+ (see Table 3).

Discussion

This was the first study to explore whether age and gender moderated belief-level constructs of the TPB and their relationship with PA in adults. In terms of mean differences, both the behavioural and normative beliefs were not altered by age or gender. Thus, social and behavioural motives for the expected PA outcome, construed at least in terms of the TPB, appear relatively invariant across age and gender. By contrast, there were marked differences in the perceptions of control across age; older adults reported more control over PA than younger adults and younger women in particular reported less control than older men. This replicates prior work in terms of the age effect (Scharff, Homan, Kreuter, & Brennan, 1999; Wankel & Mummery, 1993; Wankel et al., 1994).

Still, the specific control beliefs suggested that fatigue, lack of time, cost and social support were the key beliefs underlying these mean differences. This is a potentially important finding because PA is not completely volitional (Symons Downs & Hausenblas, 2005b); it would seem that the barriers to PA are heightened in early adulthood. Although work itself should not be considered the reason for this difference because employment status was covaried from the findings, early career work demands may be partially responsible. Some research provides evidence that hours worked may inhibit leisure-time PA (Burton & Turrell, 2000; Schneider & Becker, 2005). Another reason for these barriers may be early parenthood (Bellows-Riecken & Rhodes, in press). Large population surveys have demonstrated that the presence of children in the home is the largest sociodemographic correlate of PA after controlling other covariates (Burton & Turrell, 2000; Nomaguchi & Bianchi, 2004). Thus, control-based interventions and support may be most advantageous to younger or middle aged adults in comparison to their older adult counterparts.

Despite notable mean differences, only two of the 26 possible differences in belief-behaviour correlations emerged. Thus, the overwhelming null effects across age and gender provide considerable evidence that the motivational structure of PA, in terms of the TPB, is invariant.

As a more general note on the findings, it is worthy to highlight that belief-behaviour correlations were within the small effect size range (Cohen, 1992), even when considering belief aggregates. Small effect sizes are still important when considering public health intervention initiatives (Rutledge & Loh, 2004), but the absolute magnitude of these effects suggest that belief-based TPB interventions that are positioned for PA behaviour change will have limitations in the magnitude of that change. This has been duly noted in previous work (Sutton, 2002), but it suggests that even if the effects found in these data were completely causal in belief to behaviour mechanisms, a probable stretch, the concomitant result would be small.

This study also has methodological limitations so the results should be considered with appropriate caution. First, the study focused on basic TPB belief constructs in the PA domain (Symons Downs & Hausenblas, 2005a). Other PA correlates may still be moderated by age and gender and TPB beliefs generated at a higher level of specificity may also still be relevant. Second, PA was measured through self-report and may be biased; replication with objective instrumentation would be helpful to validate these findings. It should be noted, that PA did not differ by age or gender and this is somewhat atypical of general population findings (U.S. Department of Health and Human Services, 2003). Third, because this study is cross-sectional, cohort effects may be responsible for any differences in age or age by gender and causal implications between beliefs and behaviour are not testable. Still, the null findings in general suggest these may not be prudent limitations. Finally, age and gender may interact with other demographic variables, such as ethnicity (Blanchard et al., 2003), with PA. In this data-set, we did not have the power to evaluate this 3-way interaction as the cells across all the age and gender groupings were unbalanced and very

small in terms of ethnic representation. Future studies may find it fruitful to evaluate this potential three-way interaction using a quota-based sampling strategy.

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Table 1

Mean[A] Differences Among Age and Gender for Theory of Planned Behaviour Beliefs and Physical Activity

Age	18-24		25-34		35-44		45-54		55-64		65-74		75+		F	η^2
N	107	185	457	592	708	818	693	775	434	539	354	527	232	318		
Gender	M	Ff	M	F	M	F	M	F	M	F	M	F	M	F		
Behavioral Beliefs	3.93	4.13	3.98	4.03	3.94	4.01	3.89	4.00	3.91	4.00	3.97	4.08	3.94	4.06	3.06*	.01
	(0.72)	(0.69)	(0.64)	(0.64)	(0.71)	(0.67)	(0.79)	(0.73)	(0.79)	(0.76)	(0.76)	(0.71)	(0.75)	(0.79)		
Energy	4.09	4.16	4.18	4.16	4.04	4.17	4.07	4.14	4.06	4.14	4.00	4.16	3.97	4.20	1.86	.00
	(1.03)	(1.05)	(0.90)	(0.91)	(0.99)	(0.98)	(1.03)	(1.02)	(1.03)	(1.04)	(1.10)	(1.04)	(1.10)	(1.09)		
Stress Relief	3.74	3.99	3.92	3.98	3.91	4.00	3.95	4.02	4.00	4.10	4.03	4.08	3.94	4.09	1.90	.00
	(1.10)	(1.11)	(0.99)	(0.97)	(1.01)	(0.98)	(1.05)	(1.03)	(1.03)	(1.01)	(1.02)	(1.02)	(1.07)	(1.05)		
Fun	3.84	3.96	3.90	3.82	3.82	3.79	3.74	3.78	3.81	3.85	3.85	4.03	3.86	3.95	2.29	.00
	(1.08)	(1.04)	(1.00)	(1.05)	(1.08)	(1.11)	(1.16)	(1.14)	(1.11)	(1.17)	(1.14)	(1.06)	(1.09)	(1.10)		
Weight Control	4.08	4.40	4.15	4.27	4.11	4.26	4.05	4.21	4.03	4.16	4.09	4.23	3.89	4.09	5.07*	.01
	(1.13)	(0.96)	(0.95)	(0.91)	(0.96)	(0.95)	(1.03)	(0.96)	(1.01)	(0.97)	(0.99)	(0.92)	(1.10)	(1.12)		
Appearance	4.25	4.41	4.23	4.36	4.18	4.33	4.05	4.26	4.04	4.17	4.08	4.25	3.95	4.12	6.95*	.01
	(0.95)	(0.95)	(0.90)	(0.85)	(0.94)	(0.87)	(1.00)	(0.89)	(1.01)	(0.96)	(1.06)	(0.92)	(1.06)	(1.09)		
Social Interaction	3.21	3.29	3.31	3.13	3.18	3.08	3.05	3.16	3.05	3.19	3.15	3.34	3.26	3.39	2.89*	.01
	(1.35)	(1.29)	(1.23)	(1.32)	(1.24)	(1.30)	(1.31)	(1.29)	(1.25)	(1.28)	(1.29)	(1.28)	(1.20)	(1.22)		
Fitness	4.29	4.39	4.21	4.33	4.16	4.25	4.05	4.21	4.11	4.15	4.13	4.23	4.21	4.28	3.69*	.01
	(0.87)	(0.91)	(0.84)	(0.81)	(0.88)	(0.91)	(1.01)	(0.90)	(1.02)	(1.02)	(1.00)	(0.97)	(0.92)	(0.93)		
Reduce Disease Risk	4.09	4.31	4.15	4.20	4.20	4.27	4.20	4.25	4.19	4.22	4.27	4.35	4.27	4.38	1.73	.00
	(1.03)	(0.96)	(0.96)	(0.97)	(0.98)	(0.96)	(1.00)	(0.98)	(1.03)	(1.04)	(1.00)	(0.91)	(0.91)	(0.97)		
Daily functioning	3.59	3.79	3.58	3.68	3.58	3.70	3.61	3.69	3.65	3.81	3.79	3.79	3.77	3.75	1.99	.00
	(1.14)	(1.17)	(1.19)	(1.14)	(1.14)	(1.11)	(1.18)	(1.18)	(1.19)	(1.13)	(1.28)	(1.14)	(1.15)	(1.19)		
Feel good	4.14	4.52	4.18	4.38	4.12	4.28	4.03	4.23	4.11	4.19	4.20	4.31	4.16	4.28	6.20*	.01
	(0.92)	(0.79)	(0.87)	(0.84)	(0.99)	(0.87)	(1.05)	(0.91)	(1.05)	(1.01)	(0.94)	(0.94)	(1.00)	(1.00)		
Quality of life	4.01	4.18	4.00	4.01	4.02	4.00	3.99	4.02	3.95	4.06	4.06	4.09	4.03	4.11	0.99	.00
	(1.08)	(0.95)	(0.90)	(0.91)	(0.92)	(0.91)	(0.99)	(0.96)	(1.02)	(1.00)	(1.01)	(0.99)	(1.01)	(1.09)		
Normative Beliefs	3.94	3.73	3.97	3.88	3.88	3.89	3.76	3.70	3.88	3.70	4.02	3.86	4.02	3.88	3.06*	.01
	(1.43)	(1.35)	(1.26)	(1.34)	(1.32)	(1.30)	(1.40)	(1.26)	(1.29)	(1.25)	(1.20)	(1.15)	(1.12)	(1.12)		
Spouse/Partner	4.77	4.80	4.94	4.72	4.73	4.35	4.45	4.09	4.73	4.00	4.88	4.23	4.62	4.28	11.21*	.02
	(2.02)	(2.04)	(1.84)	(2.01)	(1.89)	(1.97)	(2.02)	(2.02)	(1.99)	(2.03)	(2.00)	(1.84)	(2.07)	(1.66)		
Family/Children	4.22	3.93	4.38	4.25	4.36	4.36	4.16	4.08	4.26	4.09	4.36	4.49	4.68	4.41	3.35*	.01
	(1.90)	(1.99)	(1.79)	(1.96)	(1.85)	(1.96)	(1.94)	(1.93)	(2.00)	(2.04)	(1.96)	(1.97)	(1.89)	(1.96)		
Friends	4.17	3.75	3.95	3.86	3.58	3.88	3.52	3.63	3.66	3.63	3.87	3.81	3.94	3.75	3.21*	.01
	(1.98)	(2.01)	(1.77)	(1.99)	(1.86)	(1.92)	(1.86)	(1.86)	(1.78)	(1.92)	(1.77)	(1.92)	(1.76)	(1.87)		
Physician	4.50	4.32	4.38	4.55	4.58	4.78	4.62	4.60	4.89	4.71	5.06	4.76	5.08	4.88	4.21*	.01
	(2.03)	(2.10)	(1.95)	(1.97)	(1.95)	(1.93)	(1.99)	(1.91)	(1.89)	(1.92)	(1.79)	(1.89)	(1.76)	(1.83)		

Control Beliefs	3.12	3.49	3.24	3.41	3.14	3.47	3.09	3.43	2.91	3.10	2.61	2.73	2.54	2.65	29.49*	.05
	(1.21)	(1.27)	(1.13)	(1.17)	(1.20)	(1.20)	(1.24)	(1.24)	(1.23)	(1.15)	(1.14)	(1.22)	(1.13)	(1.25)		
Poor Health	2.44	2.58	2.82	2.86	3.08	3.29	3.48	3.76	3.34	3.54	3.34	3.19	3.35	3.09	10.86*	.02
	(1.82)	(2010)	(1.84)	(2.04)	(2.11)	(2.26)	(2.31)	(2.34)	(2.29)	(2.27)	(2.36)	(2.32)	(2.20)	(2.32)		
Fatigue	4.55	5.07	4.71	4.98	4.33	4.91	4.23	4.64	3.90	4.17	3.54	3.48	3.59	3.45	31.15*	.06
	(2.13)	(1.97)	(1.89)	(1.88)	(1.95)	(1.92)	(1.98)	(1.88)	(1.99)	(1.92)	(2.08)	(1.93)	(1.85)	(1.93)		
Lack of Time	4.18	4.73	4.19	4.51	4.00	4.42	3.60	3.99	3.19	3.51	2.55	2.85	2.60	2.92	52.37*	.09
	(1.90)	(1.82)	(1.72)	(1.81)	(1.79)	(1.86)	(1.87)	(1.85)	(1.87)	(1.85)	(1.70)	(1.67)	(1.56)	(1.66)		
Cost	3.00	3.09	3.03	3.06	2.81	3.09	2.66	2.90	2.56	2.58	2.22	2.19	1.94	1.97	14.83*	.03
	(2.10)	(2.12)	(1.99)	(2.06)	(1.87)	(2.06)	(1.88)	(2.05)	(1.85)	(1.95)	(1.79)	(1.81)	(1.54)	(1.81)		
Lack of Access	2.56	2.83	2.67	2.74	2.66	2.83	2.57	2.82	2.58	2.59	2.23	2.47	2.07	2.35	4.87*	.01
	(1.82)	(2.05)	(1.80)	(1.89)	(1.82)	(1.96)	(1.85)	(1.99)	(1.89)	(1.95)	(1.76)	(1.95)	(1.66)	(1.92)		
Lack of Social Support	3.18	3.92	3.19	3.51	2.99	3.39	2.93	3.51	2.84	3.05	2.42	2.84	2.27	2.73	15.20*	.03
	(2.06)	(2.20)	(1.96)	(2.10)	(1.96)	(2.05)	(1.91)	(2.13)	(1.93)	(2.06)	(1.79)	(2.06)	(1.69)	(1.96)		
Lack of Knowledge	1.91	2.19	2.07	2.22	2.08	2.35	2.18	2.38	1.97	2.24	1.96	2.07	1.93	2.07	4.00*	.01
	(1.48)	(1.70)	(1.54)	(1.64)	(1.49)	(1.73)	(1.62)	(1.74)	(1.44)	(1.74)	(1.62)	(1.62)	(1.52)	(1.83)		
Physical Activity Frequency	2.41	2.08	2.27	1.89	2.14	1.71	2.01	1.64	2.07	1.53	1.94	1.82	1.90	1.30	3.75*	.01

*P<0.01; Criterion of meaningfulness based on $\eta^2 > 0.024$. Post hocs based on Cohen's (1992) effect size $d > .34$. A = adjusted means based on covariates. Education, employment status, income, marital status, and comorbidities included as covariates

Table 2

Correlation[A] Differences Among Age and Gender for Theory of Planned Behaviour Beliefs and Physical Activity

Age	18-24		24-34		35-44		45-54		55-64		65-74		75+		χ^2
N	107	185	457	592	708	818	693	775	434	539	354	527	232	318	
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Behavioral Beliefs	.06	.14	.18*	.14*	.21*	.11*	.24*	.20*	.20*	.18*	.15*	.23*	.06	.16*	16.10
Energy	.05	.11	.09	.07	.15*	.06	.21*	.16*	.16*	.13*	.07	.14*	.06	.19*	17.41
Stress Relief	-.03	.18*	.14*	.11	.13*	.11*	.18*	.16*	.14*	.15*	.07	.18*	.08	.17*	10.00
Fun	.15	.15	.12*	.18*	.24*	.12*	.20*	.16*	.19*	.13*	.08	.23*	-.01	.11	22.02
Weight Control	.09	.00	.14*	.14*	.10*	.07	.13*	.13*	.11	.13*	.12	.15*	-.04	.06	12.30
Appearance	.17	.00	.11	.06	.13*	.03	.14*	.15*	.11	.11*	.09	.13*	-.08	.09	19.22
Social Interaction	.04	.10	.04	.00	.07	-.01	.09	.03	.12	.13*	.08	.10	-.01	.05	14.39
Fitness	.10	.14	.19*	.10	.18*	.07	.22*	.17*	.18*	.15*	.16*	.19*	.17*	.17*	13.70
Reduce Disease Risk	.05	.16	.19*	.15*	.11*	.08	.20*	.12	.11	.12*	.15*	.10	.17*	.11	10.22
Daily functioning	-.17	.15	.05	.07	.14*	.10*	.22*	.17*	.21*	.11*	.08	.18*	.08	.11	28.92*
Feel good	-.02	-.02	.15	.07	.16*	.09	.17*	.17*	.14*	.15*	.18*	.16*	.04	.19*	17.95
Quality of life	.00	.01	.09	.12*	.18*	.10*	.20*	.17*	.18*	.13	.17*	.19*	.08	.08	16.99
Normative Beliefs	.20*	.10	.11	.12*	.11*	.13*	.17*	.14*	.15*	.20*	.15*	.15*	.12	.11	5.32
Spouse/Partner	.10	.13	.12*	.06	.10*	.14*	.18*	.10*	.06	.12*	.13*	.10	.21*	.02	12.36
Family/Children	.10	.08	.07	.13*	.06	.10*	.15*	.13*	.08	.17*	.19*	.08	.10	.15*	10.14
Friends	.25*	.05	.12*	.14	.12*	.09*	.18*	.14*	.13*	.18*	.12*	.15*	.10	.08	8.31
Physician	.11	-.02	.06	.09	.04	.08	.07	.05	.10	.10*	.10	.13	.10	.10	6.14
Control Beliefs	-.15	-.21*	-.23*	-.23*	-.18*	-.22*	-.24*	-.17*	-.23*	-.21*	-.22*	-.20*	-.12	-.16*	6.53
Poor Health	-.08	-.13	-.07	-.08	-.00	-.02	-.08	-.05	-.07	-.07	-.15*	-.12*	-.11	-.17*	13.86
Fatigue	-.02	-.22*	-.20*	-.19*	-.08	-.16*	-.22*	-.17*	-.18*	-.16*	-.17*	-.16*	-.13	-.15*	11.87
Lack of Time	-.02	-.07	-.25*	-.18*	-.19*	-.14*	-.13*	-.09	-.18*	-.05	-.08	-.06	-.01	-.04	28.30*
Cost	-.17	-.17	-.10	-.12*	-.10*	-.16*	-.15*	-.05	-.13*	-.14*	-.09	-.10	-.04	-.01	12.51
Lack of Access	-.21	-.01	-.13*	-.09	-.14*	-.13*	-.08	-.09	-.17*	-.09	-.12	-.10	-.04	-.09	8.44
Lack of Social Support	-.03	-.20*	-.12*	-.18*	-.19*	-.18*	-.19*	-.17*	-.18*	-.17*	-.13	-.17*	-.05	-.14*	8.31
Lack of Knowledge	-.16	-.13	-.08	-.14*	-.14*	-.16*	-.20*	-.10*	-.13*	-.15*	-.17*	-.18*	-.16	-.13	7.24
Multivariate R	.23*	.23*	.30*	.28*	.28*	.27*	.34*	.27*	.31*	.32*	.28*	.30*	.17	.23*	9.87

*P<0.01; A = adjusted partial correlations based on covariates. Education, employment status, income, marital status, and comorbidities included as covariates

Table 3

Post Hoc tests for Mean and Correlation Differences by Age and Gender.

Mean Differences	Post Hocs
Control beliefs	$M_{18\text{-}54}$, $F_{18\text{-}64} > M_{55+}$, F_{65+}
Fatigue	$M_{18\text{-}24,\ 35\text{-}44} > M_{65+}$, W_{65+}; $F_{18\text{-}44} > M_{35+}$, F_{55+}; $M_{25\text{-}34} > M_{55+}$, F_{65+}; $M_{45\text{-}54} > M_{65+,\ F\ 65+}$
Lack of Time	$M_{18\text{-}34} > M_{55+}$, F_{55+}; $F_{18\text{-}24} > M_{35+}$, F_{45+}; $F_{25\text{-}44} > M_{45+}$, F_{55+}; $M_{35\text{-}44}$, $F_{45\text{-}54} > M_{55+}$, F_{65+}; $M_{45\text{-}54}$, $F_{55\text{-}64} > M_{65+}$, W_{65+}
Cost	$M_{18\text{-}34}$, $F_{18\text{-}44} > M_{65+}$, F_{65+}; $M_{35\text{-}54}$, $F_{45\text{-}54} > M_{75+}$, F_{75+}
Low Social Support	$M_{18\text{-}34}$, $F_{25\text{-}54} > M_{65+}$; $F_{18\text{-}24} > M_{35+}$, F_{55+}; $F_{55\text{-}64} > M_{75+}$

Correlation Differences	Post Hocs
Daily Functioning	M_{25+}, $F_{18+} > M_{18\text{-}24}$
Lack of Time	$M_{25\text{-}34} > M_{18\text{-}24}$, M_{75+}, $F_{55\text{-}64}$, F_{75+}

Note: Mean post hocs based on Cohen's (1992) effect size $d > .34$. Correlation post hocs based on Cohen's (1992) effect size $q > .19$.