



Decision-making about the use of hormone therapy among perimenopausal women

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Objectives. Women reaching menopause must make a controversial decision about whether to use hormone therapy (HT). The theory of planned behaviour (TPB) was the organizing framework. The objectives were to determine if (1) influence of different TPB constructs varied with stage of menopause and HT use, (2) women with diabetes were influenced in significantly different ways from women without, (3) the overall perceived behavioural control (PBC) and self-efficacy (SE) have independent effects on intention, and (4) physician influence was mediated by subjective norm (SN).

Design. Cross-sectional survey of women from a managed care organization.

Methods. Multiple regression analysis was used to analyse 765 responses (230 from women with diabetes) and separately four main subgroups: (1) early menopause stage and never used HT, (2) late menopause stage and never used HT, (3) late menopause stage and previously used HT, and (4) late menopause stage currently using HT.

Results. For the entire sample, the model explains 68% of variance in intention, where SE, physicians' influence, self-identification with menopause as a natural part of ageing, self-identification as someone who wants to delay menopause, HT status, menopause status, and diabetes were added to the TPB. For the entire sample, SE added 2% to the explained variance and the physician determinant added 7%.

Conclusions. An augmented TPB is useful for understanding women's HT use decisions. The theory explains more variance in intention before a behaviour is enacted than after, and decision structure changes over time. PBC and SE have independent effects on intention.

Women reaching menopause must decide whether or not to use hormone therapy (HT) with either an oestrogen or an oestrogen and progestin combination. The decision has been controversial throughout much of the last 50 years and remains so today (Conrad & Schneider, 1997; Watkins, 2001; Wilson, 1966).

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During the 1990s, the prevailing opinion was that women should use HT unless they had good reason not to (American College of Physicians, 1992; American College of Obstetricians and Gynecologists, 1998). During this strongly pro-HT period, a surprising discovery was that women with diabetes used HT only about half as frequently as did women without diabetes (Keating, Cleary, Rossi, Zaslavsky, & Ayanian, 1999; Redelmeier, Tan, & Booth, 1998; Stafford, Saglam, Causino, & Blumenthal, 1997). This lower HT use was particularly noteworthy since there were felt to be compelling benefits for women with diabetes, such as a reduced risk of coronary heart disease and improved glycaemic control (Andersson, 2000; Ferrara, Barrett-Connor, Wingard, & Edelstein, 1995). It was not clear why women with diabetes used HT less often than women without, nor whether lower HT use rates among women with diabetes were due to differences in HT initiation or continuation.

Results from the Women's Health Initiative (WHI), a prospective randomized prevention study of HT use in post-menopausal women, were published in July 2002 (Writing Group for the Women's Health Initiative Investigators, 2002). Two key findings were a significant increase in breast cancer incidence and, unexpectedly, an increased risk of coronary heart disease associated with HT use. Despite widespread criticism of the study's methodology and analysis, the resulting publicity led to a considerable reduction in HT use the world over (Huang, Tsai, Hsiao, & Liu, 2007; Morabia & Costanza, 2006; Udell, Fischer, Brookhart, Solomon, & Choudhry, 2006).

The theory of planned behaviour (TPB) has been used to examine women's intention to start and/or continue to use HT (Légaré, Godin, Guilbert, Laperrière, & Dodin, 2000; Quine & Rubin, 1997; Spatz, Denis, Byrne, & Page, 2003; Visser *et al.*, 1995). It assumes decisions are rational, with benefits weighed against costs. Behaviour is influenced by the intention to perform the behaviour. Intentions are influenced by two volitional components, attitude and SN towards the behaviour, as well as non-volitional perceived behavioural control (PBC). Attitude is a general positive or negative overall evaluation of a behaviour (Ajzen & Fishbein, 1980). SN is a person's belief about whether most people important to him or her think he or she should perform the behaviour and helps account for the influence of social environment on intentions and behaviour (Ajzen & Fishbein, 1980). Classic SN measures use vague collective references and do not reveal the extent of individual referent's influence. SN is determined by normative beliefs multiplied by the motivation to comply with important referents. Physicians, family, and spouse have been identified as important referents for HT use decisions (Quine & Rubin, 1997), although physicians appear to play a pivotal role (Connelly, Ferrari, Hagen, & Inui, 1999; Marmoreo, Brown, Batty, Cummings, & Powell, 1998). To gain a fuller picture of their role we decided to specifically model physicians' influence.

It has been suggested that controllability and self-efficacy (SE) are actually two separate constructs (Armitage, 1999; Terry & O'Leary, 1995; Trafimow, Sheeran, Conner, & Finlay, 2002) with independent effects on intention. Ajzen (2002) has disputed this, suggesting SE and controllability are correlated subfactors forming the higher level PBC.

SE has been shown to significantly impact self-care activities, active coping, and quality of life among patients with diabetes (Aalto & Uutela, 1997; Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002), who must bear the burden of a complex disease management regimen (Weijman *et al.*, 2005). Results from preparatory focus groups suggested that women with diabetes had more issues with taking medications and adhering to schedules than women without diabetes. As a result, we assessed if SE had a greater impact on the intention to use HT among women with diabetes when compared with women without diabetes.

Visser *et al.* (1995) found SE explained 29% of the variance in Dutch and Belgian women's intention to continue using HT, followed by SN at 11%. A study of pre-menopausal UK women found SN to be the strongest predictor of intention to initiate HT, followed closely by PBC. (Quine & Rubin, 1997). TPB constructs explained 70% of intention to initiate HT among pre-menopausal Quebec women. Attitude had the greatest influence, followed by personal normative beliefs (an added construct), then PBC (Légaré *et al.*, 2000). Although difficult to compare because they involve women from different cultures, these studies suggest potential differences in HT decision making between women at different stages of menopause and HT experience.

The TPB is open to supplemental constructs (Ajzen & Driver, 1991). One such construct is self-identity: self-definition as a person who belongs to a particular social group (Hogg, Terry, & White, 1995; Tajfel & Turner, 1979). Self-identity can be shaped by shared meanings and can reflect commitment to a social movement (Stryker & Burke, 2000), for example being a green consumer (Sparks & Shepherd, 1992). Self-identity has been shown to add significantly to explained variance in intention to perform a variety of behaviours (Sparks & Guthrie, 1998; Sparks & Shepherd, 1992; Terry, Hogg, & White, 1999). Many women reject negative views of menopause that characterize it as either a period of 'oestrogen deficiency', or a disease that can be 'cured' with hormones (Hunter, O'Dea, & Britten, 1997; Prior, 2006). Therefore, our study included a measure of identity as 'a woman who believes in the naturalness of menopause'.

Women's perception of where they are in the menopausal process is more likely to influence their decision-making about HT than menstrually defined stage. Self-assessed stage has been found to be more closely related to endocrine status (inhibin, follicle-stimulating hormone, oestradiol) and symptoms than the menstrually defined stage (Garamszegi *et al.*, 1998).

We expect women with little menopause experience to differ in fundamental ways from women with such experience. The treatment decision for the former is still in their future; they must rely on external sources of information about menopause and its treatments. We also expect women with little or no experience to have lower topic involvement than more experienced women. Women with higher involvement are likely to have more motivation or interest in learning about menopause and its treatments (Petty & Cacioppo, 1986).

Study objectives were to determine if (1) influence of different TPB constructs varied with stage of menopause and HT use among women and (2) women with diabetes were influenced in significantly different ways from women without diabetes in regards to TPB variables. In addition, the study afforded us the opportunity to evaluate if (3) overall PBC and SE have independent effects on intention and (4) physician influence was mediated by SN.

Methods

Study population and data sources

Subjects were recruited from the members of a not-for-profit managed care organization with approximately 200,000 members in a mid-western US state. All patients had comprehensive medication benefits.

Criteria for inclusion were: (1) female, (2) between 46 and 60 years of age, (3) willing to participate, and (4) with physician-diagnosed diabetes or no such diagnosis. All women meeting the inclusion criteria and identified as having diabetes ($N = 821$) in the

managed care organization's diabetes registry were mailed surveys, along with 1,065 randomly selected women not in the diabetes registry (approximately 13,000). The registry followed specifications for the 2004 Health Plan Employer Data and Information Set Comprehensive Diabetes Care Measure, excepting the continuous enrolment requirement. For analysis, diabetes status was determined by a survey question asking if the respondent had been diagnosed with diabetes by a physician. A total of 22.4% women identified as having diabetes in the registry stated they did not have physician-diagnosed diabetes, in line with the managed care organization's previous experience. Exclusion criteria included endometrial or breast cancer during the previous 5 years and/or history of thrombophlebitis/thromboembolic disorder, which are contraindications to HT use (Ayerst Laboratories, 2002).

Surveys were mailed 10–12 months after the WHI results publication. The University Institutional Review Board and the Research Review Committee of the managed care organization approved the project.

Survey development and data collection

Findings from six preparatory focus groups and the literature were used to develop survey questions. Each focus group included six to eight women. Two groups each were held with current, previous, and never users. One group within each HT use category included only women with diabetes, and the other did not. An initial pilot questionnaire was tested during 22 in-person interviews with patients not enrolled in the managed care organization. After modification, the pilot survey was mailed to 50 women. After additional modest revisions, the final survey was mailed by the managed care organization to 1,886 women. Data collection involved five contacts (Dillman, 2000): a pre-notice letter with post-card opt-out opportunity, a mailed survey with another opt-out opportunity, a reminder/thank you post-card, and second and third mailings to non-responders at 4–6 week intervals.

Measures

Demographic information included age, education, primary population group, and income. Health history variables included ever used oral contraceptive (no/yes), surgical hysterectomy and/or ovary removal (no/yes), physician-diagnosed diabetes (no/yes), self-assessed menopause stage (without any sign yet, just beginning, in the middle, near the end, completed; Garamszegi *et al.*, 1998), and HT use status (never used, previously used, currently using).

For analysis, menopause stage was divided into early (without any sign or just beginning) or late (in the middle, near the end, completely finished). Four groups were analysed based on both the stage of menopause and HT use. Since very few women in the early stage had used HT, only the never users in this group were included in the study. Three groups were in late stage menopause: late never users, late previous users, and late current users.

TPB construct variables included measures of attitude, SN, PBC, and intention. SE and self-identification with the idea that 'menopause is a natural part of ageing' were also recorded. Variables had seven-point scales: 1 was the most negative and 7 the most positive response. Questions assessing variables were derived from published applications of the TPB and adapted for use in the present study.

Attitude towards HT use was measured with a semantic differential scale using four evaluative word pairs (extremely foolish–extremely wise, harmful–beneficial, useless–useful, and bad–good; Ajzen & Madden, 1986). The internal consistency reliability of the four items measuring attitude was high (Cronbach's $\alpha = .95$).

SN was assessed with three items: 'Most people who are important to me think I should use HT for menopause' (1 = completely disagree to 7 = completely agree; Ajzen & Fishbein, 1980; Hounsa, Godin, Alihonou, Valois, & Girard, 1993); 'Most people who are important to me would (1 = strongly disapprove to 7 = strongly approve) of my using HT for menopause' (Montaño & Kasprzyk, 2002); and 'Most people who are important to me would feel (1 = very unhappy to 7 = very happy) if I used HT for menopause' (Grube, Morgan, & McGree, 1986). Reliability was .87. The three-item mean formed the final measure.

Normative belief was assessed with 'How unlikely or likely is it that the persons or groups of persons listed below would be in favour of you using HT for menopause?' Persons and groups listed were physicians, friends, spouses, mother, and family. Motivation to comply was assessed with 'Generally speaking, how unlikely or likely is it that you want to do what the person or group of persons listed below thinks you should do regarding HT?' Response categories ranged from 1 (extremely unlikely) to 7 (extremely likely).

PBC was measured with three items. The negatively worded, reverse scored question ('I feel that using HT for menopause is beyond my control') was poorly correlated with the other items and dropped. PBC was calculated as the mean of the remaining two items ($r = .80$). The first question was 'How much control do you have over whether or not you use HT for menopause' (1 = completely not in control to 7 = completely in control); the second was 'It's mostly up to me whether or not I use HT for menopause' (1 = completely disagree to 7 = completely agree; Armitage & Conner, 1999; Terry & O'Leary, 1995).

SE was calculated as the mean of two items ($r = .83$): 'For me to use HT would be (1 = very difficult to 7 = very easy)' (Terry & O'Leary, 1995) and 'To what extent do you see yourself as capable of using HT on a daily basis?' (1 = completely incapable to 7 = completely capable; Armitage & Conner, 1999).

Self-identification with menopause being a natural part of life/ageing was discussed during all six preparatory focus groups. The identity as a person who found menopause a natural part of ageing was measured as a mean of two questions ($r = .78$) developed from those groups: 'I'm the type of person who believes in dealing with the effects of menopause as just another part of life and ageing' and 'I think of myself as a person who accepts the changes of menopause as a natural part of ageing' (1 = completely disagree to 7 = completely agree). Self-identification with menopause as natural is hypothesized to function analogously as identity in research expanding the TPB (Sparks & Guthrie, 1998; Sparks & Shepherd, 1992). The statement 'I am someone who believes the effects of menopause should be prevented or delayed as long as possible' did not correlate well with the first two items, and was tested separately in the regressions because we believed it represented a separate and an important type of identity.

Intention comprised the mean of two questions, 'I intend to use (or continue using) HT for menopause' (1 = extremely unlikely to 7 = extremely likely) and 'I will make the effort necessary to use (or continue using) HT for menopause' (1 = completely disagree to 7 = completely agree; Sparks, Guthrie, & Shepherd, 1997). Correlation between the two items was $r = .91$.

Analysis

Descriptive statistics were calculated to describe the sample in terms of demographic characteristics, the indicator variables, and theory constructs. To evaluate objective one, hierarchical multiple regression analysis was used to analyse the entire sample and the four main subgroups, which were women in the (1) early stage of menopause who had never used HT, (2) late stage of menopause who had never used HT, (3) late stage of menopause who had previously used HT, and (4) late stage of menopause who were currently using HT. To evaluate objective two, a variable for diabetes was included in the initial regression equations. Separate regression analyses of women with and without diabetes were run for the subgroups in which diabetes was a significant variable. To evaluate objective three, the measures for PBC and SE were included in the regression equations. For objective four, three regressions were calculated. SN was regressed on the physician determinant set; intention was regressed on the physician determinant set plus attitude, PBC, and SE; and finally intention was regressed on those measures plus SN.

Complete data were not available for all subjects. List-wise deletion was used. Mean-centred variables, calculated separately for each analysis group, were used because they allow the zero points of the variables to become meaningful when analyses include interactions. Nonsignificant variables, except for the classic TPB variables, were not retained in the final equations. Multicollinearity was examined using correlations and collinearity diagnostics. Outliers outside three standard deviations for the dependent variable were examined and removed only if there was a strong rationale and their exclusion resulted in significant changes.

Results

Sample description

Gross response rate was 41.5% ($N = 765$) for the entire sample. Mean respondent age was 52.5 years. The respondents were primarily Caucasian (89.7%) women with above average socio-economic status. A total of 83.8% of respondents had at least some college, with 29.9% doing postgraduate work. Approximately 29% of respondents had incomes $> 100,000$ per year. These characteristics are relatively representative of the sample population living in and around a large university community.

A total of 62.9% of respondents were in the late stage of menopause, meaning they had direct experience with menopause. A total of 52.7% of women had never used HT, 25.4% were previous users, and 21.9% were current users. Among early stage women, 83.7% had never used HT.

Theoretical construct descriptors

Descriptive statistics for the direct theoretical construct indicators for the entire sample and the four analysis subgroups are presented in Table 1. Intention was highest for women currently using HT at 6.0 ($SD 1.3$) and lowest for women who had previously used HT. Construct intercorrelations for the entire sample (below the diagonal) and for the late stage current users (above the diagonal) are presented in Table 2.

Hierarchical regression analysis results

Tables 3–8 present the final models developed from hierarchical regression analysis for the entire sample and the four analysis subgroups: (1) early never users, (2) late never

Table 1. Theoretical construct descriptors

Construct variable	Mean	SD	N	Reliability ^a	
				Cronbach's α	Correlations ^{**}
<i>Entire sample</i>					
Attitude	4.1	1.7	641	.95	
Subjective norm	3.8	1.2	641	.87	
Perceived behavioural control	6.4	0.85	641		.67
Self-efficacy	4.5	1.9	641		.72
Menopause is natural identity	5.7	1.2	641		.64
Delay/prevent menopause identity	3.7	1.8	641		
Intention	3.2	2.1	641		.83
<i>Early stage never users</i>					
Attitude	3.6	1.4	190	.95	
Subjective norm	3.7	0.9	190	.83	
Perceived behavioural control	6.5	0.8	190		.58
Self-efficacy	4.0	1.6	190		.63
Menopause is natural identity	5.8	1.1	189		.61
Delay/prevent menopause identity	3.6	1.6	190		
Intention	3.3	1.6	190		.79
<i>Late stage never users</i>					
Attitude	3.2	1.5	143	.93	
Subjective norm	3.4	1.0	143	.78	
Perceived behavioural control	6.6	1.1	143		.78
Self-efficacy	3.8	1.8	142		.73
Menopause is natural identity	6.0	1.1	143		.69
Delay/prevent menopause identity	2.8	1.6	142		
Intention	2.2	1.4	143		.76
<i>Late stage previous users</i>					
Attitude	4.0	1.7	161	.93	
Subjective norm	3.7	1.4	161	.90	
Perceived behavioural control	6.6	0.8	161		.75
Self-efficacy	4.7	2.0	161		.67
Menopause is natural identity	5.5	1.3	160		.59
Delay/prevent menopause identity	3.9	1.7	160		
Intention	2.0	1.4	161		.60
<i>Late stage current users</i>					
Attitude	5.7	1.1	113	.87	
Subjective norm	4.7	1.1	113	.86	
Perceived behavioural control	6.6	0.7	113		.50
Self-efficacy	6.3	0.9	113		.64
Menopause is natural identity	5.4	1.3	113		.63
Delay/prevent menopause identity	4.7	1.6	113		
Intention	5.9	1.3	113		.57

Note. All scales ranged from 1 = most negative to 7 = most positive. The minimum and maximum values recorded for all items were 1 and 7, respectively. N = number used to calculate the mean. Number variations within category result from items not included in the final regression calculations. Intention, perceived behavioural control (PBC), self-efficacy (SE), and menopause is natural (MN) are each the mean of two items. Delay/prevent menopause is comprised of one item. Attitude is the mean of at least one of four items, using anchor words of foolish versus wise, harmful versus beneficial, useless versus useful, and bad versus good. Subjective norm is the mean of at least two of three items. Correlations provided for constructs with only two items. Outliers were not included. ^{**} $p < .01$ for all correlations.

^aWhen there are only two items the convention is to use correlations as the measure of reliability.

Table 2. Construct intercorrelations for the entire sample (below diagonal) and for current users (above diagonal)

	Int	Att	SN	PBC	SE	NB Dr	MC Dr	NBMC Dr	MIN	Delay	Diabetes	D × SE
Intention	1.00	.33**	.17	.06	.37**	.16	-.04	.22*			-.02	.13
Attitude	.60**	1.00	.36**	.01	.36**	.09	-.04	.11			-.12	.02
SN	.48**	.50**	1.00	.01	.25**	.16	.04	.18			-.13	-.03
PBC	-.10*	-.08*	.00	1.00	.32**	.15	-.05	.11			-.15	-.03
SE	.53**	.59**	.43**	-.02	1.00	.08	.12	.10			-.07	.31**
NB-Dr	.46**	.38**	.39**	.08*	.23**	1.00	.36**	.94**			.29**	.31**
MC-Dr	.28**	.29**	.24**	-.12**	.31**	.05	1.00	.46**			.16	.17
NBMC Dr	.52**	.42**	.43**	.05	.28**	.94**	.06	1.00			.35**	.37**
MIN	-.15**	-.18**	-.07	.11**	-.12**	.02	-.12**	.01	1.00			
Delay	.33**	.34**	.27**	-.06	.32**	.11**	.18**	.16**	-.34**	1.00		
Diabetes	.00	.01	.00	-.11**	.06	-.09*	.10**	-.06	-.04	.02	1.00	.92**
D × SE	.35**	.41**	.30**	-.09*	.74**	.12**	.30**	.16**	-.10**	.23**	.68**	1.00

Note. HT, hormone therapy; Int, intention to use or continue using HT; Att, attitude; SN, subjective norm; PBC, perceived behavioural control; SE, self-efficacy; NB-Dr, normative belief concerning the physician; MC-Dr, motivation to comply with the physician; NB × MC-Dr, the multiplicative composite of NB × MC with the physician; MIN, menopause is natural identity; Prevent, prevent/delay menopause identification; D × SE, the multiplicative composite of diabetes × self-efficacy. For the entire sample, $N = 678-716$, for the current users $N = 114-118$. Significance (two-tailed) * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3. Hierarchical regression model summaries and coefficients with intention to use or continue HT use for the entire sample

Model	Additional independent variables	Final model standardized coefficients	Model R^2	R^2 change
1	Att	.20***	.41	.41***
	SN	.06*		
	PBC	-.06**		
2	SE	.13***	.43	.02***
3	NB Dr	-.13*	.51	.07***
	MC Dr	.07**		
	NBMC Dr	.30***		
4	MN	-.05*	.51	.01**
	Delay	.05 [‡]		
7	Current	.35***	.68	.17***
	Previous	-.19***		
	Early	.13***		

Note. HT, hormone therapy; Att, attitude; SN, subjective norm; PBC, perceived behavioural control; SE, self-efficacy; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; NBMC Dr, the multiplicative composite of NB \times MC with the physician; MN, menopause is natural identity; Delay, prevent/delay menopause identification; Current, current HT user; Previous, previous HT user; Early, early stage of menopause. Variables were centred and outliers ($N = 7$) were excluded if the exclusion resulted in significant changes, $N = 641$. List-wise deletion used. Reference group was late stage never users. Significance (two-tailed): * $p < .05$; ** $p < .01$; *** $p < .001$; [‡] $p = .055$. Model R^2 and R^2 change numbers do not correspond exactly due to rounding.

users, (3) late previous users, and (4) late current users. Table 5 shows results for late never users with and without diabetes combined, while Table 6 shows results for late never users with and without diabetes separately. Results are shown both ways because the separate samples were too small to achieve significance for the physician multiplicative complex. Table 8 shows separate results for late current users with and without diabetes separately. Standardized variables are presented. Unstandardized variables are available upon request. For the entire sample, the model explains 68% of the variance in intention.

For all analysis groups, classic TPB variables (attitude, SN, and PBC) were tested in the first step, and SE in the second. Results from regression models testing for mediation (Baron & Kenny, 1986) suggested that SN did not fully mediate physician influence. Therefore, the physician determinant set (physician normative belief, motivation to comply with physician, and normative belief \times motivation) was tested in step 3. Both the 'menopause is natural' and 'delay menopause' identities were added in step 4, diabetes status in step 5, and diabetes \times SE in step 6. Finally, and for the entire sample only, HT use status (current and previous) and menopause stage (early) were tested. For all five analysis groups, the three classic TPB variables were retained in the final equations, but additional variables were retained only if they or their interaction term were significant.

For the entire sample, attitude, SN, and SE significantly and positively predicted intention. As level of PBC increased, however, women were less likely to intend to use HT. The physician determinant set explained 8% of variance (Figure 1).

Table 4. Hierarchical regression model summaries and coefficients for intention to use HT among the early never users

Model	Additional independent variables	Final model standardized coefficients	Model R^2	R^2 change
1	Att	.37***	.54	.54***
	SN	.19***		
	PBC	-.10*		
2	SE	.18**	.57	.04***
3	NB Dr	.13**	.59	.03*
	MC Dr	.16**		
4	Delay	.10*	.60	.01*

Note. HT, hormone therapy. Early never users are women in the early stage of menopause who had never used HT. Att, attitude; SN, subjective norm; PBC, perceived behavioural control; SE, self-efficacy; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; Delay, prevent/delay menopause identification. Variables were centred and outliers ($N = 2$) resulting in significant changes were excluded. $N = 190$. List-wise deletion used. * $p < .05$ (two-tailed), ** $p < .01$ (two-tailed), *** $p < .001$ (two-tailed) Model R^2 and R^2 change numbers do not correspond exactly due to rounding.

Most women were somewhat unlikely to intend to use HT. If women were unmotivated to comply and thought their physician did not want them to use HT, their level of intention was similar to that of more compliant women. If women believed their physician thought they should use HT, non-compliant women had significantly lower HT intentions. This suggests that motivation to comply does play a significant role in HT decisions.

Women identifying with the ‘menopause is natural’ identity were less likely to intend HT use, while women identifying with the ‘delay menopause’ identity were more likely to intend HT use. Current users were significantly more, and previous users significantly

Table 5. Hierarchical regression model summaries and coefficients for intention to use HT among the late never users

Model	Additional independent variables	Final model standardized coefficients	Model R^2	R^2 change
1	Att	.19**	.35	.35***
	SN	.20**		
	PBC	-.16**		
2	NB Dr	.04	.44	.09***
	MC Dr	.20**		
	NBMC Dr	.28*		
3	MN	-.16*	.47	.03**
4	Diabetes	.24***	.52	.05***

Note. HT, hormone therapy. Late never users are women in the late stage of menopause who had never used HT. Att, attitude; SN, subjective norm; PBC, perceived behavioural control; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; NBMC Dr, the multiplicative composite of NB \times MC with the physician; MN, menopause is natural identity. Variables were centred and outliers ($N = 3$) resulting in significant changes were excluded. $N = 143$. List-wise deletion used. * $p < .05$ (two-tailed), ** $p < .01$ (two-tailed), *** $p < .001$ (two-tailed).

Table 6. Hierarchical regression model summaries and coefficients for intention to use HT among the late never users without diabetes and separately, with diabetes

Model	Without diabetes				With diabetes				
	Additional independent variables	Final model standardized coefficients	Model R ²	R ² Change	Model	Additional independent variables	Final model standardized coefficients	Model R ²	R ² change
1	Att SN PBC	.29** .29** -.10	.30	.30	1	Att SN PBC	.23* .19 -.29*	.49	.49
2a	MN	-.21*	.34	.04	2b	NB Dr	.34*	.56	.07

Note. HT, hormone therapy. Late never users are women in the late stage of menopause who had never used HT. Att, attitude; SN, subjective norm; PBC, perceived behavioural control; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; NBMCDr, the multiplicative composite of NB X MC with the physician; MN, menopause is natural identity. Variables were centred and outliers (N = 3) resulting in significant changes were excluded. N = 143. List-wise deletion used. *p < .05 (two-tailed), **p < .01 (two-tailed), ***p < .001 (two-tailed).

The old table with combined never users. This is actually pretty interesting. The samples are probably too small when they are separated to show the influence of the physician multiplicative complex. When separated, it becomes apparent that the menopause identity is more important for never users with diabetes, but the physician normative belief is more important for women with diabetes. That could easily make sense because women without diabetes visit physicians more frequently, and are taking medications on a regular basis. Staying 'natural' is probably not as important to them since they have to rely on medications to live anyway. It also is interesting that SN is important for non-diabetics, but the physician NB is for diabetics, while SN is not.

Table 7. Hierarchical regression model summaries and coefficients for intention to use HT among the late previous users

Model	Additional independent variables	Final model standardized coefficients	Model R^2	R^2 change
1	Att	.15	.13	.13***
	SN	.07		
	PBC	-.06		
2	SE	.16 [‡]	.15	.02
3	NB Dr	-.44	.20	.05*
	MC Dr	.05		
	NBMC Dr	.65*		

Note. HT, hormone therapy. Late previous users are women in the late stage of menopause who had previously used HT. Att, attitude; SN, subjective norm; PBC, perceived behavioural control; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; NBMC Dr, the multiplicative composite of NB \times MC with the physician. Variables were centred. No outliers were excluded. $N = 161$. List-wise deletion used. * $p < .05$ (two-tailed), ** $p < .01$ (two-tailed), *** $p < .001$ (two-tailed), [‡] $p = .055$.

less, likely to intend HT use than never users. Early stage women had a greater intention to use HT than late stage women.

Early stage never users

Among early stage never users attitude was the most influential predictor of intention, followed in order by SN, SE, motivation to comply and normative belief (physician). Least influential were PBC and the delay menopause identity (Table 4). Again, the more control women felt they had the less likely they intended to use HT.

Late stage never users

The strongest relative predictor for the group including women both with and without diabetes was the interaction term for physician influence (Table 5). Women motivated to comply with their physician increased intention with increasing normative belief, but the opposite was true for women who were very unlikely to comply with their physician. Table 5 shows that diabetes had a significant positive association with the intention to use HT. SN and attitude both positively influenced intention, while again, the greater the perceived level of control the more negative was the intention. Women identifying with 'menopause is natural' were less likely to intend HT use. When the sample is split into women without and with diabetes (Table 6), differences become the two groups become apparent. Physician normative belief is significant for women with diabetes but not for women without diabetes, while SN is significant only for women without diabetes. The menopause is natural identity is significant for women without diabetes, but not for those with diabetes.

Late stage previous users

Only the physician interaction was a significant predictor among late previous users, although SE was nearly significant at $p = .055$ (Table 7). Women who were motivated to

Table 8. Hierarchical regression model summaries and coefficients for intention to use HT among the late current users without diabetes and separately, with diabetes

Model	Without diabetes				With diabetes				
	Additional independent variables	Final model standardized coefficients	Model R ²	R ² change	Model	Additional independent variables	Final model standardized coefficients	Model R ²	R ² change
1	Att	0.36***	.15	.15**	1	Att	0.07	.13	.13
	SN	-0.15				SN	-0.12		
	PBC	-0.01				PBC	0.15		
2a	NB Dr	-1.10***	.30	.15**	2	SE	0.49**	.33	.20**
	MC Dr	-0.24*							
	NBMC Dr	1.30***							

Note. HT, hormone therapy. Late current users are women in the late stage of menopause who were currently using HT. Att, attitude; SN, subjective norm; PBC, perceived behavioural control; SE, self-efficacy; NB Dr, normative belief concerning the physician; MC Dr, motivation to comply with the physician; NBMC Dr, the multiplicative composite of NB X MC with the physician, Diabetes X SE, the multiplicative composite of diabetes and SE. Variables were centred and outliers (N = 1) resulting in significant changes were excluded. Without diabetes N = 82; with diabetes N = 31. List-wise deletion used. *p < .05 (two-tailed), **p < .01 (two-tailed), ***p < .001 (two-tailed).

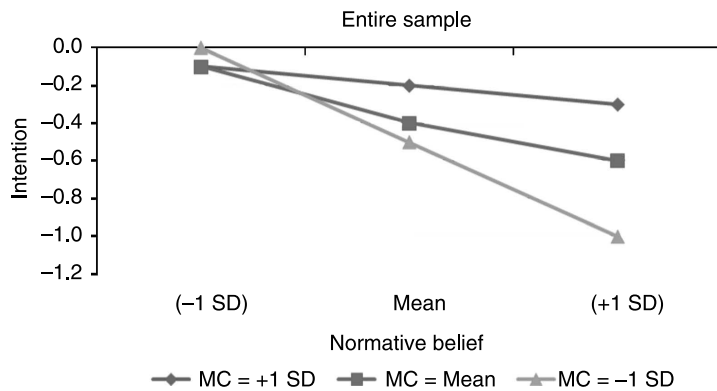


Figure 1. Interaction of normative belief and motivation to comply with physician for the entire sample.

comply with their physician generally did so, but less compliant women had significantly lower intentions to use HT the more they believed their physician wanted them to use it.

Late stage current users

For late stage current users including women both with and without diabetes, attitude, the physician multiplicative composite, and the diabetes multiplicative composite were significant predictors of intention (not presented). There was a significant interaction between SE and diabetes (Figure 2). Increasing SE significantly increased HT use intention among women with diabetes, but not among women without diabetes. Data for women with and without diabetes are presented separately (Table 8). SE was the only significant predictor for current users with diabetes, while attitude and the physician variables (normative belief, motivation to comply, and interaction term) were significant for current users without diabetes.

Discussion

The use of the TPB in evaluating HT use was supported. More variance was explained in the early stage of menopause (60%) than in later stages (Tables 3-8). The model

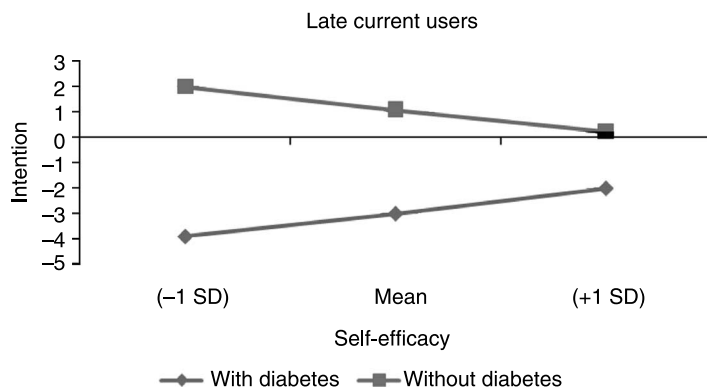


Figure 2. Interaction of self-efficacy and diabetes status among late current HT users.

explained 52% among late never users, 31% among current users, and only 20% among late previous users. These findings suggest that the model may have more explanatory power in the early stages of a decision or when there is less experience with the behaviour. For the entire group, theoretical TPB variables, attitude, and PBC, explained 41% of intention, the same as the average variance explained found in a 1996 review of studies applying the TPB to health-related behaviours (Godin & Kok, 1996). SE increased variance explained by 3%, and supports independent effects for PBC and SE. Variable importance and variance explained differed markedly between subgroups.

Attitude towards HT use

Attitude significantly predicted intention among most subgroups, except late previous users and late current users with diabetes. More positive attitudes were associated with higher levels of intention to use or continue using HT. The relative importance of attitude was greatest among early never users, less for late never users, and least for current users. Potential explanations for this are developed below.

Aarts, Verplanken, and van Knippenberg (1998) proposed repeated behaviours move from being influenced by conscious attitude towards an automatic process. Another possibility is that habit plays a role in reducing attitude importance, but the effect is due to cognitive consistency pressures or a self-perception process that increase intention formation consistent with the past (Bem, 1972). Results from this study support the latter since variance explained by attitude was lower among current and previous users when compared with never users.

Another possible explanation is that information may be used differently among subgroups. Experts are more likely to use 'skilled omission' of irrelevant information when making decisions (Ettenson, Shanteau, & Krogstad, 1987). Women with HT experience may become more sophisticated thinkers compared to never users. Late stage never users are only somewhat more sophisticated than early stage women without HT experience.

Lastly, attitude structure may change over time. The items in the attitude measure were evaluative in nature, as suggested by Ajzen and Madden (1986). Bagozzi *et al.* (2002) have suggested that at a certain level of abstraction attitude comprises two distinct components: one evaluative and the other affective. If attitudes are more evaluative in nature in early stages of a decision or when someone is unfamiliar with a situation, but become more emotion based over time with familiarity it would not have been captured by our evaluative measure.

SN and physician determinant

SN was most influential for women with little or no direct HT experience, but did not significantly predict intention among experienced women.

Approximately 60% of women stated they obtained information from family and friends regarding HT use, and viewed these sources as somewhat knowledgeable and trustworthy (Huston, Jackowski, & Kirking, 2009). It is important to ensure a wide audience receives accurate HT information.

Physician's influence on intention was not mediated by SN, explaining an additional 7% of variance for entire sample. Among early users physicians normative belief and motivation comply were significant, but overshadowed by attitude, SN, and SE. The interaction term was not significant for early users but was the strongest relative

predictor among late stage never and previous users. Women not motivated to comply with their physicians were more likely to intend actions contrary to the physician's advice than were more compliant women. Only women who were strongly against HT use were unlikely to comply with a physician who wanted them to use it. This finding suggests that motivation to comply does play a role in determining how likely women are to follow a physician's advice.

PBC and self-efficacy

Ajzen has argued that PBC is a higher-order concept comprising two factors: SE and controllability (Ajzen, 2002). This would necessitate the two constructs be highly correlated and function similarly in regard to intention, and there is evidence to support such a higher-order model (Hagger & Chatzisarantis, 2005). Numerous studies have supported separate control and SE constructs (Armitage & Conner, 1999; Manstead & van Eekelen, 1998; Terry & O'Leary, 1995; Trafimow *et al.*, 2002). In these studies control is akin to Rotter's (1966) locus of control, while SE is in line with Bandura's (1982) conception. Rhodes and Blanchard (2006) suggest PBC may have an even more complex structure than either a superordinate or two construct model (Rhodes & Blanchard, 2006).

Results from this study support the idea that the two constructs can be independent. PBC and SE were not highly correlated ($r = -.03$) and confirmatory factor analysis supports two different constructs. They also have different effects on intention. For the entire model, PBC had a negative relationship with intention, while SE had a positive relationship. In addition, among the four subgroups, PBC and SE have different significance patterns. Although a higher-order factor may be useful to reduce multicollinearity effects when correlation is high (Bagozzi, Lee, & Van Loo, 2001), their influence on intention may not be summarized by a higher order factor when correlations are low.

PBC significantly and negatively predicted intention for never users, but not for late previous or current users. Perceptions of situation controllability may influence intention more highly when direct experience is minimal. The TPB predicts PBC will positively influence intention (Ajzen & Madden, 1986), but among these never HT users there was a negative relationship between PBC and intention. SE had a positive relationship with intention, and was not correlated with PBC. The theory assumes that if you have 'the resources and opportunities to perform a certain behaviour' you will be more likely to intend to do it. Evidence suggests TPB questions, including control items, can be interpreted in a variety of ways (French, Cooke, McLean, Williams, & Sutton, 2007). 'Control' may have had a different meaning for these women who all had access to health care; perhaps a meaning that included independence and choice. Instead of greater control leading to greater intention to perform a behaviour, more control increases the intention to do as desired. The TPB does not incorporate desire, although desire has been discussed in relation to intention (Perugini & Bagozzi, 2001). Research has shown desires are both distinct from and motivate intention (Bagozzi & Edwards, 1998; Leone, Perugini, & Ercolani, 1999; Perugini & Bagozzi, 2001). Future work should continue to explore the relationship between control, desire, and intention.

Evidence suggests no strong role for SE among late never nor late current users without diabetes. It may be that the more habitual the behaviour, the less likely one is to think about implementation actions, thus decreasing SE importance. Alternatively, among late never users SE may not be seen as a relevant consideration since average

intention was negative, while current users demonstrate their SE daily. SE may play its strongest role when deliberation is intense and the possibility of deciding for or against an action is less settled.

Diabetes

Although statistically significant for the combined sample, diabetes status explained very little. Women with diabetes were not as firm in their intention to avoid HT use as women without diabetes. This ambivalence was most evident among late stage HT never users for whom diabetes status added 3% to explained variance. Evidence suggests that women with diabetes may not receive as much discussion from their physicians about HT as women without diabetes (Huston, Sleath, & Rubin, 2001), leaving them less certain about their decision.

SE appeared to be of unique importance for women with diabetes currently using HT. The differential importance of SE may contribute to decreased use of HT among women with diabetes compared to women without. Women with diabetes may need additional efforts from health care providers to increase SE to take medications like HT. This question should be investigated in future research.

Identities

Identifying oneself as a person who believes menopause is natural has a negative relationship with intention and appears strongest among late never users without diabetes. These women may take a more feminist and holistic approach, seeing menopause as a natural phenomenon, stress as caused by life-stage and life status, and thus rejecting the routine use of HT (Harris, 2008; Hunter *et al.*, 1997). Women with diabetes may not find these arguments as compelling. Future research should investigate if women with diabetes accept biomedical models more readily than women without diabetes. The delaying menopause identity was significant only for early stage women. Further research might explore whether this idea is related to notions of self as youthful or working to maintain youthfulness.

Limitations

Response rates were highest from 3-digit zip code tabulation areas with higher levels of education and income and with fewer African-Americans so results from this study, cannot be generalized to the US population. The study was cross-sectional. This design limitation is offset to some degree by the fact that we were able to compare women in different stages of menopause, and thus had time-related cohorts. Sometimes, however, when working with subgroups from a larger sample coefficients may become somewhat unstable due to smaller sample sizes. The current study did not collect information on the type of HT being used. Future research should consider collecting this information.

A limitation of the TPB in general is that it does not account for competing demands, an issue that could be particularly important for patients with multiple medical conditions. Future research into developing appropriate measures of competing demands for inclusion within the theory might provide a fuller picture for understanding patient medication taking and self-care decisions. Another potential limitation of the study is that the SE and PBC measures each relied on two items. Control and SE results should be interpreted cautiously.

Conclusion

The TPB is useful for understanding women's decisions about HT use. It has often been suggested that previous behaviour is one of the strongest predictors of intention. This study demonstrates that the theory explains more variance in intention among women in the early stages of a decision, suggesting that habit or other factors assume greater importance over time. This study also suggests that the structure of the decision differs among women at different decision points, with differing constructs playing increasingly or decreasingly important roles. While SN clearly plays a role for some women, the physician appears more influential. Results also show that SE plays an important role for women with diabetes in taking medications like HT.

References

- Aalto, A., & Uutela, A. (1997). Glycemic control, self-care behaviors, and psychosocial factors among insulin treated diabetics: A test of an extended health belief model. *International Journal of Behavioral Medicine*, 4(3), 191-214.
- Aarts, H., Verplanken, B., & van Knippenberg, A. (1998). Predicting behavior from actions in the past: Repeated decision making or a matter of habit. *Journal of Applied Social Psychology*, 28, 1355-1374.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Ajzen, I., & Driver, B. L. (1991). Prediction of leisure participation from behavioral, normative and control beliefs: An application of the TPB. *Leisure Sciences*, 13, 185-204.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- American College of Obstetricians and Gynecologists (1998). American College of Obstetricians and Gynecologists educational bulletin: Hormone replacement therapy. *American College of Obstetricians and Gynecologists*, 247, 1-10.
- American College of Physicians (1992). Guidelines for counseling postmenopausal women about preventive hormone therapy. American College of Physicians. *Annals of Internal Medicine*, 117, 1038-1041.
- Andersson, B. (2000). Hormone replacement therapy in postmenopausal women with diabetes mellitus: A risk-benefit assessment. *Drugs and Aging*, 17(5), 399-410.
- Armitage, C. J. (1999). Predictive validity of the theory of planned behavior: The role of questionnaire format and social desirability. *Journal of Community and Applied Social Psychology*, 9, 261-272.
- Armitage, C. J., & Conner, M. (1999). The theory of planned behavior: Assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology*, 38, 35-54. doi:10.1348/014466699164022
- Ayerst Laboratories (2002). *Premarin® (conjugated estrogen tablets, USP) patient package insert*. Philadelphia, PA: Wyeth-Ayerst Laboratories.
- Bagozzi, R. P., & Edwards, E. A. (1998). Goal setting and goal pursuit in the regulation of body weight. *Psychology and Health*, 13, 593-621.
- Bagozzi, R. P., Gurhan-Canli, Z., & Priester, J. R. (2002). *The social psychology of consumer behavior: (Applying Social Psychology)*. Open University Press.
- Bagozzi, R. P., Lee, H. M., & Van Loo, M. F. (2001). Decisions to donate bone marrow: The role of attitudes and subjective norms across cultures. *Psychology and Health*, 16, 29-56.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.

- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.
- Bem, D. J. (Ed.). (1972). *Self-perception theory* (Vol. 6). San Diego, CA: Academic Press.
- Connelly, M. T., Ferrari, N., Hagen, N., & Inui, T. S. (1999). Patient-identified needs for hormone replacement therapy counseling: A qualitative study. *Annals of Internal Medicine*, *131*(4), 265-268.
- Conrad, P., & Schneider, J. W. (1997). Professionalization, monopoly, and the structure of medical practice. In P. Conrad (Ed.), *The sociology of health and illness* (5th ed., pp. 163-182). New York: St Martin's Press.
- Dillman, D. A. (2000). *Mail and Internet surveys. The tailored design method* (2nd ed.). New York: Wiley.
- Ettenson, R., Shanteau, J., & Krogstad, J. (1987). Expert judgment: Is more information better? *Psychological Reports*, *60*, 227-238.
- Ferrara, A., Barrett-Connor, E., Wingard, D. L., & Edelstein, S. L. (1995). Sex differences in insulin levels in older adults and the effect of body size, estrogen replacement therapy, and glucose tolerance status: The Rancho Bernardo study, 1984-1987. *Diabetes Care*, *18*(2), 220-225.
- French, D. P., Cooke, R., McLean, N., Williams, M., & Sutton, S. (2007). What do people think about when they answer theory of planned behaviour questionnaires? A 'think aloud' study. *Journal of Health Psychology*, *12*(4), 672-687.
- Garamszegi, C., Dennerstein, E., Dudley, E., Guthrie, J. R., Ryan, M., & Burger, H. (1998). Menopausal status: Subjectively and objectively defined. *Journal of Psychosomatic Obstetrics and Gynaecology*, *19*, 165-173.
- Godin, G., & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*, *11*(2), 87-98.
- Grube, J. W., Morgan, M., & McGree, S. T. (1986). Attitudes and normative beliefs as predictors of smoking intentions and behaviors: A test of three models. *British Journal of Social Psychology*, *25*, 81-93.
- Hagger, M. S., & Chatzisarantis, N. L. D. (2005). First- and higher-order models of attitudes, normative influence, and perceived behavioural control in the theory of planned behaviour. *British Journal of Social Psychology*, *44*, 513-535. doi:10.1348/014466604X16219
- Harris, M. T. C. (2008). Aging women's journey toward wholeness: New visions and directions. *Health Care for Women International*, *29*(10), 962-979.
- Hogg, M. A., Terry, D. J., & White, K. M. (1995). A tale of two theories: A critical comparison of identity theory with social identity theory. *Social Psychology Quarterly*, *58*(4), 255-269.
- Hounsa, A. M., Godin, G., Alihonou, E., Valois, P., & Girard, J. (1993). An application of Ajzen's theory of planned behavior to predict mothers' intention to use oral rehydration therapy in a rural area of Benin. *Social Science and Medicine*, *37*(2), 253-261.
- Huang, W.-F., Tsai, Y.-W., Hsiao, F.-Y., & Liu, W.-C. (2007). Changes of the prescription of hormone therapy in menopausal women: An observational study in Taiwan. *BMC Public Health*, *7*, 56-65.
- Hunter, M. S., O'Dea, I., & Britten, N. (1997). Decision-making and hormone replacement therapy: A qualitative analysis. *Social Science and Medicine*, *45*(10), 1541-1548.
- Huston, S. A., Jackowski, R. M., & Kirking, D. M. (2009). Women's use of information sources in the treatment of menopause. *Women's Health Issues*, *19*(2), 144-158.
- Huston, S. A., Sleath, B., & Rubin, R. H. (2001). Physician gender and hormone replacement therapy discussion. *Journal of Women's Health and Gender-Based Medicine*, *10*(3), 279-287.
- Keating, N. L., Cleary, P. D., Rossi, A. S., Zaslavsky, A. M., & Ayanian, J. Z. (1999). Use of hormone replacement therapy by postmenopausal women in the United States. *Annals of Internal Medicine*, *130*(7), 545-553.

- Légaré, F., Godin, G., Guilbert, E., Laperrière, L., & Dodin, S. (2000). Determinants of the intention to adopt hormone replacement therapy among premenopausal women. *Maturitas*, *34*, 211–218.
- Leone, L., Perugini, M., & Ercolani, A. P. (1999). A comparison of three models of attitude-behavior relationships in the studying behavior domain. *European Journal of Social Psychology*, *29*(2/3), 161–189.
- Manstead, A. S. R., & van Eekelen, S. A. M. (1998). Distinguishing between perceived behavioral control and self-efficacy in the domain of academic achievement intentions and behaviors. *Journal of Applied Social Psychology*, *28*(15), 1375–1392.
- Marmoreo, J., Brown, J. B., Batty, H. R., Cummings, S., & Powell, M. (1998). Hormone replacement therapy: Determinants of women's decisions. *Patient Education and Counseling*, *33*, 289–298.
- Montaño, D. E., & Kasprzyk, D. (2002). The theory of reasoned action and the theory of planned behavior. In K. Glanz, B. K. Rimer, & F. M. Lewis (Eds.), *Health behavior and health education: Theory, research, and practice* (3rd ed., pp.67–98). San Francisco, CA: Jossey-Bass, chap. 4.
- Morabia, A., & Costanza, M. C. (2006). Recent reversal of trends in hormone therapy use in a European population. *Menopause*, *13*(1), 111–115.
- Perugini, M., & Bagozzi, R. P. (2001). The role of desires and anticipated emotions in goal-directed behaviors: Broadening and deepening the theory of planned behavior. *British Journal of Social Psychology*, *40*, 79–98. doi:10.1348/014466601164704
- Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer.
- Prior, J. C. (2006). Perimenopause lost – reframing the end of menstruation. *Journal of Reproductive and Infant Psychology*, *24*(4), 323–335.
- Quine, L., & Rubin, R. (1997). Attitude, subjective norm and perceived behavioural control as predictors of women's intentions to take hormone replacement therapy. *British Journal of Health Psychology*, *2*, 199–216.
- Redelmeier, D. A., Tan, S. H., & Booth, G. L. (1998). The treatment of unrelated disorders in patients with chronic medical diseases. *The New England Journal of Medicine*, *338*(21), 1516–1520.
- Rhodes, R. E., & Blanchard, C. M. (2006). Conceptual categories or operational constructs? Evaluating higher order theory of planned behavior structures in the exercise domain. *Behavioral Medicine*, *31*(4), 141–150.
- Rose, M., Fliege, H., Hildebrandt, M., Schirop, T., & Klapp, B. F. (2002). The network of psychological variables in patients with diabetes and their importance for quality of life and metabolic control. *Diabetes Care*, *25*(1), 35–42.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, *80*(1), 1–18.
- Sparks, P., & Guthrie, C. A. (1998). Self-identity and the theory of planned behavior: A useful addition or an unhelpful artifice? *Journal of Applied Social Psychology*, *28*(15), 1393–1410.
- Sparks, P., Guthrie, C. A., & Shepherd, R. (1997). The dimensional structure of the perceived behavioral control construct. *Journal of Applied Social Psychology*, *27*, 418–438.
- Sparks, P., & Shepherd, R. (1992). Self-identity and the theory of planned behavior: Assessing the role of identification with 'Green Consumerism'. *Social Psychology Quarterly*, *55*(4), 388–399.
- Spatz, B. A., Denis, L. T., Byrne, J., & Page, B. J. (2003). Use of the theory of planned behavior to explain HRT decisions. *American Journal of Health Behavior*, *27*(4), 445–455.
- Stafford, R. S., Saglam, D., Causino, N., & Blumenthal, D. (1997). Low rates of hormone replacement in visits to United States primary care physicians. *American Journal of Obstetrics and Gynecology*, *177*(2), 381–387.
- Stryker, S., & Burke, P. J. (2000). The past, present, and future of identity theory. *Social Psychology Quarterly*, *63*(4), 284–297.

- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks-Cole.
- Terry, D. J., Hogg, M. A., & White, K. M. (1999). The theory of planned behavior: Self-identity, social identity and group norms. *British Journal of Social Psychology*, *38*, 225–244. doi:10.1348/014466699164149
- Terry, D. J., & O’Leary, J. E. (1995). The theory of planned behavior: The effects of perceived behavioral control and self-efficacy. *British Journal of Social Psychology*, *34*, 199–220.
- Trafimow, D., Sheeran, P., Conner, M., & Finlay, K. A. (2002). Evidence that perceived behavioral control is a multidimensional construct: Perceived control and perceived difficulty. *British Journal of Social Psychology*, *41*, 101–121. doi:10.1348/014466602165081
- Udell, J. A., Fischer, M. A., Brookhart, M. A., Solomon, D. H., & Choudhry, N. K. (2006). Effect of the Women’s Health Initiative on osteoporosis therapy and expenditure in Medicaid. *Journal of Bone and Mineral Research*, *21*(5), 765–771.
- Visser, A. P., Hofland, I., Gehring, B., DeVries, H., Tomlow, P., Van Nunen, M., ... Smits, E. (1995). The continuation of hormone replacement therapy: A compliance study of Dutch and Belgian climacteric women. *Journal of Reproductive and Infant Psychology*, *13*, 135–146.
- Watkins, E. S. (2001). Dispensing with aging: Changing rationales for long-term hormone replacement therapy, 1960–2000. *Pharmacy in History*, *43*(1), 23–37.
- Weijman, I., Ros, W. J. G., Rutten, G. E. H. M., Schaufeli, W. B., Schabracq, M. J., & Winnubst, J. A. M. (2005). The role of work-related and personal factors in diabetes self-management. *Patient Education and Counseling*, *59*, 87–96.
- Wilson, R. A. (1966). *Feminine forever*. New York: Evans.
- Writing Group for the Women’s Health Initiative Investigators (2002). Risks and benefits of estrogen plus progestin in healthy postmenopausal women. *Journal of the American Medical Association*, *288*(3), 321–333.