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# A Theory-based Approach to Understanding Follow-up of Abnormal Pap Tests

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## Abstract

We applied a general theoretical framework to understand intentions to attend recommended follow-up for abnormal Pap results. Participants were 338 women attending university-affiliated clinics. Intention was associated with favorable attitudes toward follow-up (OR = 5.3); perceiving attending follow-up as consistent with one's self-concept (OR = 3.0); self-efficacy (OR = 1.8); and believing one would be told exactly what is wrong (OR = 1.3). Intention was negatively associated with believing the problem could be avoided by not returning for follow-up (OR = 0.75). Beliefs, affect and attitudes differed by race and ethnicity (all  $p < .05$ ). Attendance at follow-up was related to attitude and self-concept (both  $p < .05$ ). Results have implications for theory development and patient education.

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## Keywords

- *cervical cancer screening*
- *ethnicity*
- *race*
- *theory-based*

## Introduction

CERVICAL cancer is the second most common cancer among women worldwide (Parkin, Bray, Ferlay, & Pisani, 2005). In the USA, it is estimated that over 11,000 women will be diagnosed with cervical cancer while over 3900 women will lose their lives to this disease in the year 2008 (American Cancer Society, 2008). Minority populations and women of lower socioeconomic strata (SES) bear a disproportionate burden of cervical cancer morbidity and mortality (Freeman & Wingrove, 2005; Jemal et al., 2007; Parikh, Brennan, & Boffetta, 2003; Singh, Miller, Hankey, & Edwards, 2004) in part reflecting poor access to high-quality regular screening and more advanced disease upon screening (American Cancer Society, 2007).

Although regular Pap screening followed by adherence to treatment or monitoring of precursor lesions can prevent over 90 percent of cervical cancer mortality (Holman & Armstrong, 1987; IARC Working Group, 1986), poor rates of adherence to follow-up care for abnormalities have been observed. For instance, some studies report that 38–56 percent of women do not adhere to recommendations to attend a follow-up appointment for an abnormal Pap test result and are therefore at risk of developing invasive cervical cancer (Massad & Meyer, 1999; Michielutte, Dignan, Bahnson, & Wells, 1994; Peterson, Han, & Freund, 2003). Barriers to adherence to follow-up have been reviewed by Eggleston, Coker, Das, Cordray and Luchok (2007) and reflect a complex interaction of psychosocial, demographic and institutional factors. Among women who are members of racial or ethnic minority groups, economic and institutional factors have been implicated, as differences in adherence rates by race or ethnicity were not observed when examined within the context of free or reduced-cost programs (Coker, Eggleston, Meyer, Luchok, & Das, 2007; Eggleston, Coker, Luchok, & Meyer, 2007).

Health behavior theories can provide a valuable foundation for studying behaviors surrounding cervical cancer prevention. For instance, in the UK, Orbell and colleagues (Orbell & Hagger, 2006; Orbell, Hagger, Brown, & Tidy, 2006) used the theory of planned behavior to distinguish between women who completed follow-up treatment for an abnormal Pap test versus those who did not. In the USA, similar studies are needed that focus on economically disadvantaged populations for whom free

or low-cost screening (but not always treatment) programs exist.

A general, unifying model has been proposed to assist in understanding voluntary health behavior and provide an organizing framework for applied behavioral research. The framework is based in social psychological models of attitudes and behavioral decision making (Fishbein et al., 1991; Jaccard, Litardo, & Wan, 1999) and includes key constructs from explanatory theories including the health belief model, the theory of planned behavior and social cognitive theory (see Conner & Norman, 2001). In this investigation, the framework is used to guide an examination of intentions surrounding follow-up of abnormal Pap test results among women of low SES or ethnic minority groups who attend cervical cancer screening. According to the framework, behavior is directly influenced by four core variables. Specifically, in order for behavior to occur, the individual must intend, or be motivated to perform the behavior and must possess the requisite knowledge or skills for behavioral performance. Moreover, the behavior must be salient to the individual and not prohibited by external constraints. Proponents of this unifying framework contend that if any one variable is suboptimal, behavior is unlikely to occur.

A second sequence is proposed that outlines the determinants of an individual's behavioral intention, or willingness to perform the action being measured. According to this sequence, an individual's intention to perform a particular behavior is determined by attitudes, social norms, expectancies, self-concept, affect and emotion and self-efficacy surrounding the behavior; these factors combine in an additive fashion toward the prediction of intention. In turn, these psychological constructs exert an indirect influence on behavior through their impact on intention. According to the general framework and the theories underlying it, all demographic, biological and personality variables are assumed to influence behavior via their impact on the core predictors.

The constructs comprising this general unifying framework have been specifically operationalized with regard to follow-up of abnormal Pap test results in low-income and minority women (Radecki Breitkopf, Catero, Jaccard, & Berenson, 2004). The present investigation seeks to extend this work by examining women's intentions to attend follow-up care for an abnormal Pap test result with regard to each of theory-based constructs and exploring adherence to recommended follow-up among

women who actually experience an abnormal Pap test result. Specifically, we will examine the relationship between women's intention to attend follow-up care for an abnormal Pap test result and their reported attitudes, social norms, expectancies, self-concept, affect and self-efficacy as they relate to attendance at follow-up. In addition, we will conduct exploratory analyses on the predictors of adherence to recommended follow-up among women who experience an abnormal Pap test result and are asked to return for a follow-up clinic visit.

## Methods

### Participants

Eligible participants were women 18–50 years of age who attended routine cervical screening at one of two university-affiliated clinics in southeast Texas between 25 October 2002 and 19 June 2003. During the recruitment period, 429 women met eligibility criteria; of these, 356 (83%) women agreed to participate while 73 (17%) refused. Women who agreed to participate did not differ from those who refused with respect to age,  $t = -1.29, p = .20$ . However, more married than unmarried (27% versus 13%, respectively;  $\chi^2 = 11.05, p < .01$ ), more Hispanic than white and African American (34% versus 5% and 9%, respectively;  $\chi^2 = 48.85, p < .001$ ), and more uninsured than insured (20% versus 7%, respectively;  $\chi^2 = 7.48, p < .01$ ) women refused to participate.

Of the 356 women who initially agreed to participate, 338 completed the survey while 18 women left the clinic before completing their survey (primarily due to time constraints). These 18 women did not differ from study participants on age,  $t = -0.96, p = 0.34$ ; however, 12 percent of Latinas initially accepted but did not complete the survey relative to 3 percent of whites and 0 percent of African Americans,  $\chi^2 = 17.56, p < .001$ .

### Procedure

Women provided written informed consent and completed a self-administered paper-and-pencil questionnaire in English or Spanish. The majority of women (84.9%,  $n = 287$ ) completed the survey in English. The study was approved by the Institutional Review Board at the University of Texas Medical Branch, Galveston (UTMB).

Questionnaire items were derived from a previous qualitative study performed in the same clinic setting (Radecki Breitkopf et al., 2004). In this prior

work, semi-structured interviews were conducted to operationalize the general theoretical constructs (e.g. affect, self-efficacy, knowledge) for the specific domain of cervical cancer prevention. Based on this work, a closed-ended questionnaire was developed and initially pilot-tested among 142 women to determine acceptability of length, language and content. The questionnaire was translated by a native speaker of Spanish and back-translated by a Spanish–English bilingual individual who possessed knowledge of language nuances typical of Spanish that is spoken in Texas or Mexico. Conceptual consistency between the two survey versions was sought over literal 'word-for-word' consistency. For a number of the theoretical constructs we were assessing, traditional scales and response options failed to yield adequate psychometric properties during a pilot-testing phase of the survey instrument. In some cases, we suspected there was a mismatch between the cognitive demand of the survey and the literacy of the participants in the pilot study. In other cases, the responses we obtained during pilot testing may have reflected the highly socially desirable nature of the items. For instance, for the item 'How likely or unlikely would you be to return for follow-up if you had an abnormal Pap test result?' the only response that was chosen was 'extremely likely', and lack of variability would have created analytic problems. Several iterations of the item wording and response options were examined prior to arriving at the final version of the English and Spanish surveys. Where available from pilot-testing, psychometric data are presented for the theory-based constructs. Pilot-testing was conducted among women recruited from the same clinic setting who did not participate in the main study.

### Measures

**Sociodemographic and Pap history** Social and demographic characteristics included age, ethnicity, marital status, education, birth country, employment status, ownership of primary residence and annual household income. Abnormal Pap history was self-reported by the participant; additionally, all prior Pap tests obtained at UTMB, and their results, were abstracted from the medical chart.

**Social desirability** The Socially Desirable Response Set (Hays, Hayashi, & Stewart, 1989) was used as a measure of socially desirable response tendency. The scale is a five-item extraction from the

well-tested, but longer Marlowe-Crowne scale (Crowne & Marlowe, 1960). A sample item is: 'No matter who I'm talking to, I'm always a good listener.' This scale uses a five-point 'definitely true' to 'definitely false' response metric. Total scores were obtained by summing the number of 'definitely true' responses for a possible range of scores from 0–5, with higher scores indicating a greater tendency for socially desirable responding. In the present study, Cronbach's alpha was 0.65.

**Behavioral intention** The item, 'If I had an abnormal Pap smear, I would definitely return for follow-up, no matter what' was used to assess behavioral intention. Participants responded to the item using a 'strongly agree' (6) to 'strongly disagree' (1) rating scale. Eighty-eight percent ( $n = 298$ ) of women strongly agreed they would return for follow-up. Behavioral intention was correlated with social desirability ( $r = 0.12, p < .05$ ) and recoded for analysis as 'strongly agree' (1) versus all other responses (0).

**Attitude** Participants used a Guilford-type rating scale to express the degree to which they felt favorable or unfavorable toward returning for follow-up (Ajzen & Fishbein, 1980). Using a seven-point 'extremely unfavorable' (–3) to 'extremely favorable' (+3) rating scale women were asked, 'How do you feel about coming back for follow-up of an abnormal Pap smear result?' The attitude variable was uncorrelated with social desirability ( $r = 0.07, NS$ ). Based on the distribution of this item, a dichotomous variable was created for multivariate analysis, which reflected 'extremely favorable' (1) versus all other responses (0).

**Normative beliefs** Normative beliefs concern the behavioral prescriptions of important others (referents) and one's motivation to comply with the referent. A global measure of social pressure was used which reflected the product term of the normative belief: 'Overall, most people who are important to me think I should come back for follow-up of an abnormal Pap smear' and its corresponding motivation to comply: 'Overall, I want to do what the people who are important to me think I should do regarding follow-up of an abnormal Pap.' To formulate mathematically appropriate product terms, the normative belief was coded using a 'strongly disagree' (–3) to 'strongly agree' (+3) scale while the intention to comply was scored as 'not at all' (0) to 'strongly' (+3) (Ajzen & Fishbein, 1980), with a possible range of –9 to +9.

**Expectancies/beliefs** We assessed the perceived likelihood of 21 positive and negative beliefs regarding the consequences of returning and not returning for follow-up of an abnormal Pap test result. The beliefs addressed both short- and long-term consequences that were derived during an earlier elicitation study (Radecki Breitkopf et al., 2004). We assessed the likelihood of each expectancy (e.g. 'being told exactly what was wrong', 'waiting a long time at the clinic') using a six-point scale with the endpoints 'strongly agree' (+3) to 'strongly disagree' (–3). Cronbach's alpha for the 21 beliefs was 0.73.

To identify influential beliefs, the 21 beliefs were simultaneously regressed onto the dichotomous intention variable. To protect against Type I error, the alpha level for the 21 expectancies was set at 0.05/21 ( $p < .002$ ). Two beliefs emerged in this analysis: 'If I came back for follow-up of an abnormal Pap smear, I would be told exactly what is wrong' ( $M = 2.14 \pm 1.45$ ) ('be told'; OR = 1.66; 1.26–2.19,  $p < .0001$ ), and 'By not coming back for follow-up, I can avoid dealing with the problem' ( $M = -1.66 \pm 2.18$ ) ('avoid'; OR = 0.69; 0.55–0.87,  $p < .01$ ). In pilot-testing, the two-week test–retest correlation coefficients for 'being told exactly what is wrong' and 'avoiding the problem' were  $r = 0.43$  ( $p < .001$ ) and  $r = 0.35$  ( $p < .001$ ), respectively, and in the present study, only small correlations with social desirability were observed ( $r = 0.16, p < .05$ ;  $r = -0.05, NS$ , for being told what is wrong, and avoiding the problem, respectively).

**Self-concept** Self-concept reflects the degree to which a woman perceives adhering to follow-up as consistent with her view of herself. We used a Likert-type scale with endpoints 'strongly agree' (+6) to 'strongly disagree' (+1) to measure how similar the participant was to a woman who would return for follow-up: 'Overall, I am a lot like the type of woman who would come back for follow-up (if I had an abnormal Pap smear).' Responses to this item were unassociated with social desirability scores ( $r = 0.002, NS$ ). For multivariate analyses, self-concept was entered as a dichotomous variable with 'strongly agree' (1) versus all other responses (0).

**Affective responses** In previous work by Radecki Breitkopf et al. (2004), 14 affective responses toward returning to the clinic for follow-up were identified. The responses included: nervous, angry, calm (reverse-scored), worried, depressed, relieved (reverse-scored), embarrassed, upset, 'afraid I have

cancer', 'afraid of not knowing what to expect', 'afraid that I will be told I have a sexually transmitted disease', 'afraid that the problem can not be treated', 'afraid I will be rejected by my spouse/boyfriend' and 'afraid that I will find out something is wrong'. In the current investigation, women were given the phrase: 'When I think about coming back for follow-up of an abnormal Pap smear result I feel ...' and asked to indicate the degree to which they felt each affective response using a 'very slightly or not at all' (+1) to 'extremely' (+5) rating scale.

Factor analysis revealed three underlying factors: sadness (three items,  $\alpha = 0.76$ ), fear (seven items,  $\alpha = 0.85$ ) and rejection (four items,  $\alpha = 0.61$ ) accounting for 59.2 percent of the variance. Subscale scores were computed by summing the responses for the items comprising each subscale, with higher scores reflecting more negative states. Factor score means ( $\pm$ SD) for sadness, fear and rejection were  $5.67 \pm 2.92$ ,  $22.90 \pm 7.00$  and  $7.97 \pm 4.07$ , respectively.

**Self-efficacy** Self-efficacy reflects the perceived confidence that a woman can return to the clinic for recommended follow-up should she have an abnormal Pap test result. We used a 'strongly agree' (+6) to 'strongly disagree' (+1) scale to elicit responses to the statement, 'If I had an abnormal Pap smear, it would be easy for me to take all the necessary steps to come back to the clinic for follow-up within the recommended time.' In pilot-testing, the two-week test-retest correlation coefficient was  $0.30 (p < .01)$ ; in the present study, the correlation with social desirability was  $0.16 (p < .01)$ .

**Knowledge and skills** Knowledge and skills required to attend follow-up were assessed using multiple instruments. Women were presented with 20 true/false questions measuring their knowledge of the purpose of the Pap test, symptoms, signs and implications of an abnormal finding and follow-up procedures. Cronbach's alpha was 0.88. Overall scores were obtained by summing the correct responses for a possible range of 0–20. A complete description of the knowledge data has been reported elsewhere (Radecki Breitkopf, Pearson, & Breitkopf, 2005). We also measured the degree to which women believed they possessed two important skills related to returning to the clinic for a follow-up visit using a 'strongly agree' (+1) to 'strongly disagree' (+6) rating scale. The items included knowledge regarding how they would be notified of an abnormal result ('I don't know how you find out if your Pap smear is

normal') and being able to plan a clinic visit around menses ('If necessary, I know how to figure out when I will not be on my period in order to schedule a follow-up appointment'). Two-week test-retest correlations for finding out results and planning around menses were  $0.42 (p < .001)$  and  $0.46 (p < .001)$ , respectively. Items were scored such that higher scores reflect greater knowledge and skills.

**Environmental constraints** Environmental constraints consider external circumstances that represent barriers to following through with intended behavior. We measured three behavior-specific items using a 'strongly agree' (+6) to 'strongly disagree' (+1) rating scale; higher scores reflect greater environmental constraints. Items included: 'My schedule can make it very difficult for me to come back to the clinic for follow-up if I had an abnormal Pap smear', 'For me, not having transportation on the day of a clinic appointment is a real possibility, even if I wanted to go to my appointment' and 'Even if I wanted to come back for follow-up of an abnormal Pap smear, I do not have the money to pay for treatment'. Cronbach's alpha was 0.58, with an average inter-item correlation of 0.32; correlations with social desirability were  $-0.05$  (NS) for money,  $-0.04$  (NS) for transportation and  $-0.20 (p < .01)$  for scheduling.

**Salience** Salience was measured by assessing the perceived memorability and perceived importance of attending follow-up for an abnormal Pap test result. We asked participants to rate 'How easy or difficult would it be for you to remember to come back for follow-up if you had an abnormal Pap result?' (memorability) using an 'extremely easy' (+6) to 'extremely difficult' (+1) rating scale. Second, participants indicated how important or unimportant they felt attending follow-up of an abnormal Pap test would be (importance) using an 'extremely important' (+6) to 'extremely unimportant' (+1) rating scale. Finally, we assessed responses to the statement 'Missing one follow-up appointment for an abnormal Pap smear just isn't that serious' (seriousness) using a 'strongly agree' (+1) to 'strongly disagree' (+6) rating scale. The first and third items were associated with the social desirability measure,  $r = 0.16$  and  $r = 0.18$ , both  $p < .01$ . The first two items were reverse-scored relative to the last so that higher scores reflect greater overall salience. Cronbach's alpha for the three items was 0.50.



**Adherence** The results of Pap testing from the clinic visit in which patients were enrolled in the study were tracked by electronic medical chart. An abnormal result was defined in this study as any result that required a follow-up appointment. Among women with abnormal results, attendance at follow-up was ascertained by medical chart review. To be considered adherent, a woman must have attended her follow-up appointment on the day that it was scheduled (coded 1). Non-adherent women were those who did not attend their follow-up appointment as scheduled (coded 0).

### Analysis plan

Descriptive data are presented as mean  $\pm$  standard deviation (SD), frequencies and percentages. Univariate-level analyses (zero-order correlation coefficients, *t*-tests ANOVA, chi-square test of independence) were performed as appropriate to evaluate the relationships between the six predictors of intention to follow-up and to examine racial and ethnic differences in these constructs. A logistic regression analysis was performed in which behavioral intention was simultaneously regressed onto attitude, normative beliefs, self-concept, self-efficacy, 'be told' and 'avoid' expectancies, social desirability and the three affect scores reflecting sadness, fear and rejection. Analyses of actual behavior are presented as exploratory in nature, as only a small number of women had abnormal Pap test results. Statistical significance was set at  $p < .05$  (two-tailed); the abbreviation NS is used to denote non-significance.

## Results

### Participant characteristics

The mean age of the sample was  $30.0 \pm 8.6$  years ( $Mdn = 28$ , range = 18–49 years,  $N = 338$ ). Other participant characteristics are presented in Table 1. One woman was excluded from further analysis because she did not use the response options provided for many of the survey items and her data, although not missing, could not be entered; thus, 337 women were included in the final analysis.

### Behavioral intention and its determinants

With regard to intention to attend follow-up, 88 percent of women ( $n = 298$ ) indicated 'strongly agree', 6 percent ( $n = 22$ ) indicated 'moderately agree' and

Table 1. Participant characteristics ( $N = 338$ )

Characteristic	<i>n</i>	%
<b>Race/Ethnicity</b>		
Hispanic	107	31.7
White	116	34.3
African American	115	34.0
<b>Marital status</b>		
Single (never married/ divorced/separated/widowed)	234	69.2
Married	102	30.2
Missing	2	0.6
<b>Education</b>		
High school diploma/GED or less	205	60.6
Vocational training/Some college or more	127	37.6
Missing	6	1.8
<b>Country of birth</b>		
USA	274	81.1
Mexico	48	14.2
Other	16	4.7
<b>Employment</b>		
$\leq 20$ hours/week	206	60.9
21–40 hours/week	95	28.1
$> 40$ hours/week	30	8.9
Missing	7	2.1
<b>Annual household income</b>		
$< \$10,000$	160	47.3
$\geq \$10,000$	160	47.3
Missing	18	5.4
<b>Residence in public housing project</b>		
Yes	44	13.0
No	255	75.4
Don't know	33	9.8
Missing	6	1.8
<b>Financial class<sup>a</sup></b>		
Medicaid	67	19.8
Indigent/zero-pay	201	59.5
Privately insured/Self pay	69	20.4
Medicare	1	0.3

<sup>a</sup> Medicaid: federally funded health insurance program for individuals with very low incomes; indigent/zero-pay: total family income is less than twice the federal poverty index; Medicare: federally funded health insurance program for individuals  $\geq 65$  years of age.

3 percent ( $n = 10$ ) indicated 'slightly agree'. Approximately 1 percent ( $n = 7$ ) of women disagreed that they would definitely attend follow-up if necessary. Intention did not vary according to history of an abnormal Pap test ( $p > .05$ ).

Overall, 68 percent ( $n = 230$ ) of women reported a favorable attitude toward follow-up; of these women, over half ( $n = 134$ ) reported an 'extremely

Table 2. Logistic regression model for intent to follow-up for an abnormal Pap test ( $N = 337$ )

Predictor	$\beta$	SE $\beta$	$p$ value	Exp ( $\beta$ )	95% CI for Exp ( $\beta$ )
Constant	-3.50	1.13	<.01	0.03	-
Attitude	1.166	0.67	<.05	5.26	1.42-19.49
Expectancy (be told)	0.26	0.12	<.05	1.30	1.03-1.63
Expectancy (avoid)	-0.29	0.09	<.001	0.75	0.63-0.89
Affect (sad)	-0.05	0.09	NS <sup>†</sup>	0.95	0.79-1.14
Affect (fear)	0.04	0.04	NS	1.04	0.96-1.12
Affect (reject)	0.04	0.06	NS	1.04	0.92-1.18
Self-concept	1.10	0.47	<.05	2.99	1.19-7.55
Self-efficacy	0.58	0.14	<.001	1.79	1.35-2.38
Normative beliefs	-0.02	0.06	NS	0.98	0.88-1.10
Social desirability	0.19	0.16	NS	1.21	0.89-1.65

<sup>†</sup> Not significant

favorable' attitude toward follow-up. Additionally, 17 percent ( $n = 59$ ) of women reported an unfavorable attitude toward follow-up, and 14 percent ( $n = 48$ ) reported 'neither favorable nor unfavorable'. Normative beliefs were generally positive ( $M = 5.33 \pm 3.90$ ), with 77 percent of normative belief scores between +1 and +9, 21 percent with a score equal to 0 and 2 percent of scores being negative (-9 to -1). With regard to self-concept, 55.5 percent ( $n = 187$ ) of women indicated strong agreement with the statement 'Overall, I am a lot like the type of woman who would come back for follow-up if I had an abnormal Pap smear.' On average, self-efficacy was high ( $M = 5.34 \pm 1.22$ ) and social desirability was low ( $M = 1.71 \pm 1.50$ ).

Attitude, expectancies, self-concept and self-efficacy were significantly associated with intention to follow-up while controlling for the effects of socially desirable responding (Table 2). The logistic regression model correctly classified 90 percent of cases and explained approximately 33 percent of the variance in behavioral intention.

### Racial and ethnic differences

Twenty-eight percent of Hispanics had extremely favorable attitudes toward attending follow-up, versus 43 percent of whites and 47 percent of African Americans ( $\chi^2 = 9.44$ ,  $p < .01$ ). No racial or ethnic differences were found with regard to normative beliefs, self-concept or self-efficacy.

Racial and ethnic differences were observed with regard to fear of rejection by a partner or spouse (affect),  $F(2, 335) = 5.37$ ,  $p < .01$ . Bonferroni-adjusted pairwise comparisons revealed that white women had a significantly lower score (reported less fear of rejection by a partner or spouse) relative

to African American or Hispanic women (both  $p < .05$ ). No other significant differences in affective responses were observed.

Racial and ethnic differences were also observed with regard to the expectancies, 'If I came back for follow-up of an abnormal Pap smear, I would be told exactly what is wrong',  $F(2, 335) = 3.86$ ,  $p < .05$ , and 'By not coming back for follow-up, I can avoid dealing with the problem',  $F(2, 335) = 13.25$ ,  $p < .001$ . Bonferroni-adjusted pairwise comparisons revealed that African Americans ( $M = 2.44 \pm 1.2$ ) believed more strongly than whites ( $M = 1.95 \pm 1.6$ ) that if they came back for follow-up of an abnormal Pap smear, they would be told exactly what is wrong ( $p < .05$ ). Additionally, Hispanic women ( $M = -0.81 \pm 2.6$ ) believed more strongly than white ( $M = -2.19 \pm 1.7$ ) and African American ( $M = -1.9 \pm 1.9$ ) women that by not returning for follow-up, they can avoid dealing with the problem (both  $p < .001$ ).

### Behavior and its determinants

Approximately 90 percent of participants ( $n = 301$ ) underwent Pap testing at the study visit while 11 percent ( $n = 36$ ) did not either due to clinical reasons (e.g. the patient had menses/bleeding at the time, the patient's last Pap test was performed within one year of the visit) or because the patient left the clinic before being seen by her healthcare provider. Seventeen percent ( $n = 50$ ) of women experienced an abnormal Pap test result that required a follow-up visit. Sixty percent ( $n = 30$ ) of abnormalities were classified as ASCUS, 28 percent ( $n = 14$ ) were classified as SIL (squamous intraepithelial lesion), 8 percent ( $n = 4$ ) were classified as AGUS/ASCUS/HGSIL ASCUS (atypical squamous cells of undetermined significance) HGSIL



(high-grade squamous intraepithelial lesion) AGUS (atypical glandular cells of undetermined significance) cannot be excluded, and two women (4%) were asked to return to the clinic for a repeat Pap test, with results unspecified. Of the women asked to return to the clinic for follow-up, 60 percent ( $n = 30$ ) were adherent while 40 percent ( $n = 20$ ) were non-adherent.

Exploratory analyses were conducted on the 50 women who experienced an abnormal result. Adherence did not differ by race or ethnicity, with 53.3 percent of Hispanic, 50.0 percent of white and 69.6 percent of African American women adhering to follow-up ( $p > .05$ ). Additionally, adherence did not significantly differ by source of payment for medical care, income, education, age, marital status or history of an abnormal Pap test (all  $p > .05$ ).

We also examined whether adherence differed by the four direct predictors of behavior: knowledge/skills ( $M = 8.7 \pm 3.6$ ), environmental constraints (scheduling:  $M = 2.50 \pm 1.8$ , transportation:  $M = 2.2 \pm 1.7$ , money:  $M = 3.4 \pm 1.9$ ), salience (memorability:  $M = 5.3 \pm 1.1$ , importance:  $M = 5.6 \pm 1.0$ , seriousness:  $M = 4.8 \pm 1.5$ ) and behavioral intention. Knowledge scores did not differ between women who were non-adherent ( $M = 8.75 \pm 3.5$ ) and women who were adherent ( $M = 10.23 \pm 3.1$ ),  $p > .05$ . Similarly, scores on the two skills related to follow-up (planning around menses, knowing how to find out your Pap test result) were unrelated to adherence (both  $p > .05$ ). Mean scores reflecting environmental constraints surrounding scheduling, transportation and money did not differ by adherence (all  $p > .05$ ). Furthermore, the three indicators of salience (memorability, importance, seriousness) were unassociated with adherence (all  $p > .05$ ).

Forty-six out of 50 women indicated a very strong intention to return for follow-up prior to knowing their Pap results while four women did not. In bivariate analyses, 63 percent of women who 'strongly agreed' that they intended to come back for follow-up actually returned for their follow-up appointment, while only 25 percent of those who did not strongly agree returned for their follow-up ( $\chi^2 = 2.22, p > .05$ ).

Exploratory analyses examining relationships between adherence and predictors of intention revealed significant relationships between adherence and attitude ( $\chi^2 = 4.33, p < .05$ ), and adherence and normative beliefs ( $t = -2.37, p < .05$ ). In both cases, the relationships were in the expected direction. Among those reporting an extremely favorable attitude toward follow-up, 75 percent actually

returned for their recommended follow-up versus 46 percent of those who held an attitude less than extremely favorable. With regard to normative beliefs, women who were adherent had higher (more supportive) normative belief scores ( $M = 6.17 \pm 3.8$ ) relative to women who were non-adherent ( $M = 3.55 \pm 3.9$ ),  $p < .05$ .

## Discussion

We used a general theory of voluntary behavior as a foundation for understanding adherence to follow-up for an abnormal Pap test result in a predominantly minority and low SES population. Consistent with the theory, intention to return for follow-up was related to a positive attitude toward follow-up, viewing oneself as similar to a woman who was adherent and having high self-efficacy with regard to the multiple steps required to return to the clinic for follow-up. Furthermore, this study identified two behavioral beliefs that were associated with attending follow-up and importantly, that differed by a woman's race or ethnicity. African American women believed more strongly than white women that by returning for follow-up, they would be told exactly what is wrong. An increase of one point on the rating scale for this belief corresponded to a 1.3 (1.1–1.7) times greater likelihood of a strong intention to return for follow-up. While many women in the sample reported believing that one cannot really avoid the problem by not coming back for follow-up, Hispanic women disagreed with this statement less than did whites and African Americans. This finding may be interpreted to suggest that efforts to identify and prevent strategies for avoidance may be particularly important for Hispanic women.

Numerous studies have documented high levels of anxiety and fear among women faced with follow-up treatment (e.g. colposcopy, biopsy) for an abnormal Pap test result (Lerman et al., 1991; Marteau, Kidd, Cuddeford, & Walker, 1996; Rogstad, 2002). Our study evaluated 21 items comprising a three-factor construct of affect, yet our measures of affect were not associated with women's intentions surrounding follow-up or with adherence itself. Women of lower SES may think differently about future events due to the burdens of daily living. Thus, when we asked them (before they received a Pap test at their clinic visit) to evaluate how they might feel about having an abnormal Pap test result, they may not have been able to fully relate to this hypothetical future event.

In this study, women who were members of racial and ethnic minority groups (relative to white women) reported greater fear that they would be rejected by their boyfriend or spouse if they came back for follow-up of an abnormal Pap test result. This finding is novel and suggests the need for further exploration into the perceived consequences of attending follow-up among minority women.

We did not find evidence that normative beliefs were related to intention to adhere to follow-up. This is consistent with studies addressing obtaining a Pap test (Jennings-Dozier, 1999), and in other behavioral domains such as smoking (Hanson, 1997) and use of the female condom (Bogart, Cecil, & Pinkerton, 2000). Some of these authors have posited that single-item measures of subjective norm may not be able to capture the effect (Jennings-Dozier, 1999) while others point to indirect influences of subjective norm on intention by influencing attitude and self-efficacy (Hanson, 1997). Importantly, the influence of others on an individual's behavior may differ by race and ethnicity, as well as by the behavior in question. Stronger relationships between norms and intentions may be observed among racial and ethnic groups that maintain closer family bonds. Further exploration of the subjective norm component should include multiple measures of normative beliefs and a variety of behaviors to provide a greater understanding of the role of normative beliefs on health behavior.

Poor adherence to follow-up for dysplasia has been associated with demographic characteristics such as young age (Marcus & Crane, 1998), single marital status, low education level (Michielutte, Diseker, Young, & May, 1985), lack of private health insurance (Kavanagh & Simpson, 1996) and race and ethnicity (Marcus et al., 1992). In the present study, no such relationships were observed. The clinics in which the study was conducted are part of a university-based clinic system that is dedicated to serving low-income women and their children (Anderson, Nelson-Becker, Hannigan, Berenson, & Hankins, 2005). It is possible that the patient-centered approach and focus on cultural sensitivity in these clinics reduced differences in adherence that are observed in other healthcare settings that serve vulnerable populations, however it is more likely that failure to detect differences was the result of a small sample size and low statistical power.

In our analyses, adherence to follow-up was unrelated to knowledge/skills, environmental constraints, salience and intention. It is likely that a small sample

size coupled with small effect sizes hindered our ability to effectively assess these relationships despite our use of multiple measures. Additional studies with larger sample sizes are needed to more fully evaluate theory-based constructs in this behavioral domain.

There are several limitations to the current work. First, to reduce bias surrounding self-reports of adherence to medical recommendations (Gritz, DiMatteo, & Hays, 1989), we measured adherence by chart review. It is possible that women we coded as non-adherent sought care elsewhere. Additionally, published criteria for measuring patient compliance and classifying patients as adherent or non-adherent are variable; we used a rigid measure of adherence in this study which did not classify patients as adherent if they rescheduled their appointment and attended the rescheduled appointment. Second, more Hispanic, married and indigent women refused participation in the study, which is a potential source of sampling bias. Third, we did not include a measure of past behavior for women who previously experienced an abnormal Pap result. Fourth, the rate of abnormal Pap test results in our sample was 14.7 percent, thus, only 50 women were available for analyses pertaining to adherence, which limited our statistical power. In recognition of this limitation, we present these findings as only exploratory and emphasize that further work is needed. Fifth, the data were collected in 2002 and 2003; important advances have occurred in cervical cancer prevention since that time, such as the approval of a vaccine to prevent cervical cancer in many countries. These advances in clinical practice and their associated increased attention and focus on cervical cancer prevention are not reflected in the data we report. Finally, theory-based research requires the use of lengthy and sophisticated survey instruments that may not be amenable to all populations or applied settings. We attempted to use multiple measures to assess theory constructs as well as a variety of rating scales and 'check-box' type responses, all of which were derived from interviews and pilot-testing among a similar clinic population (Radecki Breitkopf et al., 2004). Despite these efforts, Cronbach's alpha was low for several of the scales and it is likely that measurement error was present. Furthermore, we did not have a sufficient sample size to analyze the data using techniques that would incorporate measurement error. In many cases, we artificially categorized continuous variables to reflect actual patterns of responding, as women frequently did not use the discrimination points in the rating scales (e.g. slightly versus moderately). These processing 'shortcuts' may be

reasonable for the data we collected from a population characterized by low literacy, although they likely limited our ability to detect certain relationships. Additionally, we used a translated survey instrument for Spanish-speaking women who wished to participate without formally evaluating the cultural comparability of the two instruments as has been recommended (Cantor et al., 2005).

The results of this study have implications for theory development, patient education and clinical intervention. For instance, the general theoretical framework we applied offers some understanding of intention and behavior regarding follow-up care for abnormal Pap test results in a vulnerable population. The strengths and weaknesses of our measurement approach and the existence of some, but not all, expected relationships between theory constructs can be used to further engage in theory development. Furthermore, in our study, women who were members of racial or ethnic minority groups experienced different fears and beliefs surrounding attending follow-up for an abnormal Pap test result. These findings may be useful to clinicians, who may deliver more targeted information to their patients regarding the potential consequences of not attending follow-up care. Additionally, efforts to reinforce that women receiving abnormal results have already overcome barriers to attend Pap testing in the clinic and thus they are similar to women who care about their health may bolster self-confidence and create a self-image consistent with following doctor's orders. Finally, research is currently underway to test an intervention derived from several constructs comprising the theoretical framework used in this study to improve adherence rates among women of racial and ethnic minorities and lower SES who experience abnormal cervical screening results.

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