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An Empirical Test of the Information-Motivation-Behavioral Skills Model of ART Adherence in a Sample of HIV-Positive Persons Primarily in Out-of-HIV-Care Settings

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Abstract

The current body of evidence supporting the Information, Motivation, Behavioral Skills (IMB) model of antiretroviral therapy (ART) adherence rests exclusively on data collected from people living with HIV (PLWH) at point-of-HIV-care services. The aims of this study were to: (1) determine if the IMB model is a useful predictive model of ART adherence among PLWH who were primarily recruited in out-of-HIV-care settings; and (2) assess whether the theorized associations between IMB model constructs and adherence persist in the presence of depression and current drug use. PLWH ($n=312$) responding to a one-time online survey completed the Life Windows IMB ART Adherence Questionnaire, and demographic, depression (CES-D 10), and drug use items. Path models were used to assess the fit of a saturated versus fully-mediated IMB model of adherence, and examined for moderating effects of depression and current drug use. Participants were on average 43 years of age, had been living with HIV for 9 or more years, and mostly male (84.0%), Caucasian (68.8%), and gay-identified (74.8%). The a priori measurement models for information and behavioral skills did not have acceptable fit to the data, and were modified accordingly. Using the revised IMB scales, IMB constructs were associated with adherence as predicted by the theory in all but one model (i.e., the IMB model operated as predicted among non-drug users, and those with and without depression). Among drug users, information exerted a direct effect on adherence, but was not significantly associated with behavioral skills. Results of this study suggest that the fully or partially-mediated IMB model is supported for use with samples of PLWH recruited primarily out-of-HIV-care service settings, and is robust in the presence of depression and drug use.

Keywords

ART Adherence; Internet; Behavioral Theory; Information-Motivation-Behavioral Skills Model; Outside Point-of-Care Settings

INTRODUCTION

Point-of-HIV-care computer-based interventions for antiretroviral therapy (ART) adherence recently have gained attention and support (Fisher et al., 2011). However, current reviews highlight the value of technology-based interventions accessed from out of point-of-HIV

care for their potential to interact with hard to reach or out-of-care individuals (Chiasson, Hirshfield, & Rietmeijer, 2010; Kurth et al., 2007; Ybarra & Bull, 2007), particularly for communities highly saturated with Internet access and mobile technologies. Additionally, observational research using Internet surveys may reach populations not previously included in targeted research (Pequegnat et al., 2007), and some research suggests that theory-based factors associated with health behavior adoption may differ between patients who use the Internet and those who do not (Anderson-Bill, Winett, Wojcik, & Winett, 2011).

The Information, Motivation, Behavioral Skills (IMB) model is a common model used for ART adherence theory and intervention development (Fisher, Fisher, Amico, & Harman, 2006; Fisher, Fisher, & Harman, 2003). The current body of evidence that supports the IMB model of ART adherence, however, rests exclusively on data collected at point-of-HIV-care service (i.e., participants recruited and data collected at HIV care sites). Specifically, the IMB model for ART adherence has been evaluated and supported using clinic-based samples in Puerto Rico (Amico, Toro-Alfonso, & Fisher, 2005), Italy (Starace, Massa, Amico, & Fisher, 2006), and Mississippi (Amico et al., 2009). Although, this builds confidence in the model's propositions for the role of adherence-related information, motivation and behavioral skills among HIV care attendees, and thus also can reasonably advise point-of-HIV-care delivered intervention approaches. However, generalizability to broader samples of people living with HIV (PLWH) reflecting on determinants of their medication adherence outside of the immediate context of HIV clinical care settings is presently unknown. Moreover, in the development of new technology-based interventions based on the IMB model intended for deployment outside of care settings (Horvath et al., 2013), support for the model garnered from responses in similar modalities would provide confidence in those interventions.

This study was conducted to answer two primary research questions. First, do the core IMB constructs provide a good fit to self-reported ART adherence in a sample of predominantly gay/bisexual HIV-positive men recruited primarily outside of point-of-HIV-care settings? Our second area of inquiry concerned the moderation hypothesis of the IMB-model, which suggests that the relations in the model may be impacted by the presence of "extreme" conditions, such as depression and drug use (Fisher et al., 2006). Despite this prediction, no empirical tests of the IMB model have examined moderation effects of these factors. Thus, we also sought to determine if the associations observed between IMB model constructs and adherence behaviors persist according to the IMB model in the presence of depression and current drug use.

METHOD

Participants and Procedure

An online survey was conducted from July-November, 2009 to assess theoretically-grounded and empirically-derived risk factors for poor adherence to HIV medication (Horvath et al., 2012). Inclusion criteria for this study were being 18 years of age or older and English-speaking, reporting an HIV seropositive diagnosis, and residing in the United States.

Participants were recruited in several ways: (1) banner advertisements on, or e-mail newsletters from, HIV-related websites (53.5%); (2) targeted online ads on Facebook (12.8%); (3) an invitation to screen e-mail sent to persons who had participated in prior studies who requested to be notified of new study opportunities (4.5%); and (4) referral to the website with postcards and fliers distributed at US-based AIDS Service Organizations (ASO) (29.2%). Although data was not collected on the specific location in which participants were recruited using print media at ASOs, few of the collaborating ASOs

reported that they allowed participants to complete the survey using an on-site computer. All participants must have screened for inclusion into this study and provided a valid e-mail address to be included in the analyses. Participants were reimbursed \$25 for their time. All procedures were approved by the University of Minnesota Institutional Review Board.

Measures

The survey consisted of 170 items in total. Measures included self-reported demographic factors, IMB-related ART adherence items, psychosocial factors, and a ART adherence item (see Table 1).

Outcome variable—ART adherence was assessed with a single item asking participants to indicate the percent time they took their prescribed HIV medication in the previous month as directed by their doctor, with 1% increments from 0% to 100% (Simoni et al., 2006). Medication adherence was dichotomized into either high adherence (>95% adherence) or lower adherence group (<95% adherence), which is a commonly used cut-off score in adherence-related research (Gordon, 2006) based on prior studies demonstrating that high levels of adherence to HIV medications must be achieved to attain optimal virologic and clinical outcomes (Pasternak et al., 2012; Paterson et al., 2000).

IMB-related adherence predictor variables—IMB-related ART adherence constructs were measured using the Life Windows IMB ART Adherence Questionnaire (LW-IMB-AAQ; The LifeWindows Project Team, 2006), which consists of nine self-reported items assessing information, ten assessing personal and social motivation, and fourteen assessing behavioral skills. The LW-IMB-AAQ is the standard IMB-related ART adherence scale, and has been used in prior empirical tests of the IMB model for ART adherence (Amico et al., 2009; Amico et al., 2005; Starace et al., 2006).

Psychosocial variables—Psychosocial factors measured for the purpose of this study included depressive symptoms (10-item Center for Epidemiologic Studies – Depression Scale or CES-D 10, $\alpha=.88$; Radloff, 1992); perceived stress (Perceived Stress Scale, $\alpha=.88$; Cohen, Kamarck, & Mermelstein, 1983); life chaos (Life Chaos Scale, $\alpha=.77$; Wong, Sarkisian, Davis, Kinsler, & Cunningham, 2007); and alcohol use (Alcohol Use Disorders Identification Test or AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). Participants were asked to indicate the number of times they had used 10 illicit substances (e.g., powder cocaine, crack cocaine, methamphetamines, heroin) in the past 30 days. Drug use was collapsed into a bivariate measure of whether they had used one or more of these illicit substances in the past 30 days.

Analysis

Of the 387 valid participants, 312 reported being in HIV medical care and taking ART at the time of survey completion, and constitute the sample for these analyses. Non-parametric tests of proportions (e.g., chi-square analysis) were used to assess group differences.

Measurement models—Similar to a prior examination of the IMB model (Amico et al., 2009), the impact of personal and social motivational on adherence was assessed separately. We tested confirmatory factor analysis models for each of the IMB constructs using a robust maximum likelihood estimator. Scale was set by constraining the variance of each latent variable to unity. Fit was assessed with the χ^2 , the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), and the root mean square error of approximation (RMSEA; Steiger, 1990). Values of 0.95 or greater for the CFI and TLI and 0.08 or below for the RMSEA are generally regarded as indicative of good fit (Hu & Bentler, 1999). In the case of model misspecification, we used a random split half (training

and validation samples) of the data to conduct exploratory analyses of the measures. A posteriori modifications to the measurement models were guided by modification indices and substantive interpretation. Multi-group comparisons of the two split halves were used to validate the structure of the revised measures (Brown, 2006).

Path models—We used the unit-scaled averages for each of the constructs to test two path models: (1) a saturated model with information and motivation having a direct association with adherence as well as indirect through behavioral skills, and (2) a fully-mediated model in which any association between information and motivation is mediated through behavioral skills. Path models were estimated with mean- and variance-adjusted weighted least squares on account of the dichotomous outcome variable (high vs. low adherence). Saturated and fully-mediated models were constructed for both crude (i.e. unadjusted) models and models adjusted for demographic and psychosocial covariates. Finally, we tested for effect measure modification of the path model as a function of drug use and depression using a multi-group model. We compared the stratified models with paths constrained to equality between the groups to the model in which the paths were freely estimated in each group using the “diffest” statement in *Mplus*, version 6.0 (Muthen & Muthen, 2009). Indirect effects were estimated via the *model indirect* subcommand, and 95% confidence intervals were estimated with 10,000 bootstrap redraws of the data (Shrout & Bolger, 2002).

RESULTS

Demographics

Demographics for the total sample and by adherence level are shown in Table 1. Most participants were male (84.0%), Caucasian (68.8%), and gay-identified (74.8%). The average age of participants was 43 years, and most had been living with HIV for nine or more years. The average CES-D 10 score was 13.2, and 13% reported using illicit drugs (with the exception of marijuana) in the past 30 days.

Measurement Model

The a priori measurement models for information and behavioral skills did not have acceptable fit to the data (Information: $\chi^2 = 257.58$, $df = 20$, $p < .001$; CFI = .47, TLI = .26, RMSEA = 0.20, 90% CI = 0.18, 0.21, Behavioral skills: $\chi^2 = 300.63$, $df = 65$, $p < .001$; CFI = .87, TLI = .84, RMSEA = 0.11, 90% CI = 0.10, 0.12). The two-factor model of motivation, however, had acceptable fit to the data and was not revised further.

Modifications to information and behavioral skills measures in the training split-half yielded reduced versions for both scale measures with improved model fit. Modifications were validated in the remaining split-half to minimize capitalizing on chance variation. Table 2 presents the scale items with the factor loadings from the final measurement models when applied to the whole sample. Model fit indices are reported, showing acceptable to good fit for all three domains of the IMB model.

The reduced measures of information and behavioral skills had strong correlations with their original scale scores ($r = 0.87, 0.97$, respectively), indicating that the revisions to the two measures largely removed redundancy and did not have a strong impact on the rank ordering produced by the original measure. Table 3 displays the correlations between each of the updated scale measures with each other. All four measures of the IMB model were positively correlated with one another, which is consistent with the theory of how these measures should relate.

Path Model

In the crude (unadjusted) saturated and fully-mediated path models for the overall sample (not shown), all pathways from IMB factors to adherence operate as predicted by the IMB model. There was no appreciable worsening of model fit in the fully-mediated model ($\chi^2 = 3.09$, $df = 3$, $p = .378$) compared to the saturated model and similar results were found in models adjusted for demographic and psychosocial factors. Therefore, we adjusted for those factors and only present the adjusted models in Figures 1 and 2.

Depression was not identified as an effect modifier of the associations between IMB constructs and adherence (models not shown, but are available from corresponding author). However, we identified current drug use as an effect measure modifier of the association between information and behavioral skills and ART adherence. The path models presented here are from a multi-group model in which the path models for both drug users and non-users were estimated simultaneously.

Figure 1 shows the path coefficients for a saturated path model relating information, personal motivation, social motivation, and behavioral skills directly to adherence, as well as information and motivation constructs operating through behavioral skills. Among non-drug-using participants, only behavioral skills demonstrated a statistically significant association with ART adherence. Among current drug-using participants, both information and behavioral skills had a direct effect on ART adherence and information had no association with behavioral skills. Among current drug users, motivational factors continued to operate via behavioral skills.

Compared to the model in which all paths are included and freely estimated for each drug group, removal of the non-significant paths from information and motivation to adherence did not harm model fit ($\chi^2 = 5.19$, $df = 4$, $p = .268$). Constraint of the common paths in the reduced model to equality by drug use strata did not worsen model fit ($\chi^2 = 0.22$, $df = 3$, $p = .974$), suggesting that the common paths had equivalent associations across drug use groups (Figure 2). Among non-drug users, all of the associations between information and motivation and adherence was a function of behavioral skills. The indirect associations were: information (0.28, 95% CI = 0.09, 0.47), personal motivation (0.23, 95% CI = 0.12, 0.33), and social motivation (0.12, 95% CI = 0.00, 0.25). The indirect associations for personal and social motivation among drug users were equivalent to non-drug users. The indirect association for information, as expected, was not statistically significant (0.07, 95% CI = -0.08, 0.23).

DISCUSSION

The results of this study provide support for the utility of a fully or partially mediated IMB model of ART adherence among this sample of mostly gay/bisexual men who completed an online survey in primarily out-of-HIV-care settings. Consistent with prior empirical tests of the IMB model for ART adherence (Amico et al., 2009; Amico et al., 2005; Starace et al., 2006), adherence information and motivation (including both personal and social) influenced adherence behavior through behavioral skills, even in the context of current depressive symptoms and drug use (with the one exception discussed below). The moderation analyses conducted in the current study informs current understanding of the utility of the IMB model in the presence of factors that have been shown to strongly compromise adherence. While the IMB model of adherence posits that extreme levels of certain potential moderators of adherence (eg., depression or substance abuse) may moderate the relations of the core model constructs (Fisher et al., 2006), our results are consistent with suggestions that the IMB model may in fact be quite robust (Amico, 2011). Overall, the results of this study suggest that the IMB model is both supported for use with similar

samples of PLWH responding to online surveys primarily in out-of-HIV-care settings, and is robust in the presence of depression and drug use.

The only exception to this pattern was that, among current drug users, ART adherence information had a direct effect on adherence rather than exerting its influence through behavioral skills. A possible explanation for this finding is that for some PLWH, drug use disrupts processes that are critical to information processing and adherence behavioral skills. In a prior study of 90 injection drug-using PLWH who received a neuropsychological battery, impairment in functioning was detected on a number of processes, including learning and memory of verbal information, problem solving skills, the ability to manage more than one stimulus at a time, visual-motor coordination, and cognitive flexibility (Margolin, Avants, Warburton, & Hawkins, 2002). However, for drug-using PLWH who are not neuropsychologically compromised, adherence information may be salient enough to bypass diminished behavioral skills to exert a direct influence on adherence. For this reason, adherence interventions grounded in the IMB model may need to be modified for drug-using PLWH by allocating equal and sustained resources to heighten adherence information and behavioral skills (since these results do not suggest a synergistic effect between these two factors on adherence) to achieve the desired effects on ART adherence. Regardless of whether ART information operates directly on adherence behaviors or indirectly via behavioral skills, providing relevant ART information appears to be a necessary component of interventions that aim to improve adherence behaviors among non-drug using and drug using PLWH.

The analyses used in this study were unique in that models were adjusted for demographic (age, race, gender, year of HIV diagnosis, residential area, annual income) and psychosocial (alcohol use, life chaos, and perceived stress) factors. Literature reviews show that these and other factors are important determinants of ART adherence (Altice et al., 2010; Rabkin & Rabkin, 2008; Simoni et al., 2010), and therefore should be accounted for when testing behavioral models of ART adherence. The results of this study showed that the IMB model was upheld after adjusting for these factors, which provides greater confidence that IMB factors affect adherence behaviors independent of the effects of other important determinants.

This study has a number of limitations in which the results should be considered. First, the current study is a cross-sectional design and, therefore, causal relationships between IMB constructs and adherence behavior cannot be made. As noted previously (Amico et al., 2007), longitudinal studies of the effects of IMB model constructs are needed to advance understanding in the field. Second, a convenience sampling strategy was used to recruit participants for the purposes of this study. Of note, the sample in this study was predominantly gay/bisexual men, and all participants must have completed the survey online, thus limiting the potential external validity of the results. As such, the results may not represent all HIV-positive persons who respond to online surveys, or the HIV-positive population overall. Third, similar to prior tests of the IMB model (e.g., Amico et al., 2009), this study uses self-reported data that may be prone to reporting bias. Fourth, the study contains a disproportionately low percentage of minority PLWH compared to the overall US HIV epidemic (Centers for Disease Control and Prevention, 2012), and future studies would benefit from enrolling higher proportions of minority participants. Finally, this sample may have included some participants who completed the online survey at an ASO. Information on the specific location in which participants completed the survey was not collected, which should be included in future studies.

Despite these limitations, this represents the first study to empirically test the IMB model of ART adherence among PLWH primarily responding to an online survey in out-of-HIV-care

settings and to demonstrate the utility of the IMB model in the presence of depression and current drug use. It therefore makes an important contribution to our understanding of the applicability of theoretically-grounded models of adherence for persons who might respond to new media adherence interventions that are conducted outside of HIV care settings. In addition it suggests that the IMB-based interventions may be appropriate for PLWH who report psychological and chemical dependency problems.

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Figure 1.

Saturated path model of IMB constructs to ART adherence, stratified by drug use in the last 30 days

Note: Info = information, Beh. Skill = behavioral skills. Coefficients and standard errors are presented on each path. Adjusted for age, race, gender, year of HIV diagnosis, residential area, annual income, alcohol use, CES-D-10, life chaos, and perceived stress. * $p < .001$

Figure 2.

Final path model of IMB constructs to ART adherence, stratified by drug use in the last 30 days

Note: Info = information, Beh. Skill = behavioral skills. Adjusted for age, race, gender, year of HIV diagnosis, residential area, annual income, alcohol use, CES-D-10, life chaos, and perceived stress. * $p < .001$.

Table 1

Participant demographics, Internet Medication Adherence Study (2009)

		Total		High Adherence		Low Adherence		Sig.
		M (SD)		M (SD)		M (SD)		
Age (n=312)	Years	43.1 (9.8)		43.3 (9.7)		42.8 (9.8)		0.672
Education (n=312)	Years	15.1 (2.7)		15.6 (2.9)		14.6 (2.4)		0.003
Depression (n=308)	CES-D 10	13.2 (7.4)		11.6 (7.7)		14.6 (6.8)		0.0003
Stress (n=310)	Perceived Stress	19.3 (7.9)		17.7 (8.3)		20.7 (7.3)		0.0008
Chaos (n=310)	Life Chaos	15.6 (5.06)		13.9 (4.8)		17.3 (4.8)		0.0000
Gender (n=312)	Male	84.0	Col %	47.3	Row %	52.7	Row %	0.569
	Female	15.4		50.0		50.0		
	F2M Trans	0.6		100.0		0.0		
Race/Ethnicity (n=311)	African American	13.8		27.9		72.1		0.014
	Caucasian	68.8		53.3		46.7		
	Latino/Latina	12.9		42.5		57.5		
	Other	4.5		35.7		64.3		
Sex Orientation (n=309)	Heterosexual	19.1		57.6		42.4		0.112
	Gay	74.8		46.9		53.3		
	Bisexual	6.2		31.6		68.4		
Yrs Living with HIV (n=312)	0-3 Years	19.6		59.0		41.0		0.097
	4-8 Years	27.6		51.2		48.8		
	9-15 Years	24.7		41.6		58.4		
Residency (n=312)	16-28 Years	28.2		40.9		59.1		
	Small Town	15.4		43.8		56.2		0.001
	Medium City	26.6		55.4		44.6		
	Large City	37.2		55.2		44.8		
Income (US \$) (n=306)	Downtown	20.8		26.2		73.8		
	0-10,000	15.7		39.6		60.4		0.002

	Total	High Adherence	Low Adherence	Sig.
	35.6	37.6	62.4	
	25.5	50.0	50.0	
	12.4	52.6	47.4	
	10.8	75.8	24.2	
Alcohol (n=310)	71.9	53.4	46.6	0.001
No alcohol problem				
Hazardous drinking	14.5	42.2	57.8	
Alcohol Dependency	13.6	23.8	76.2	
Recent Drug Use (past 30 days) (n=312)	86.9	49.5	50.5	0.067
No				
Yes	13.1	34.2	65.8	

Table 2

IMB items used in data collection for the Internet Medication Adherence Study (2009) and factor loadings for the updated scale measures

Item	Factor loading	Residual
INFORMATION^a		
<i>IA1: I know how each of my current HIV medications are supposed to be taken (for example whether or not my current medications can be taken with food, herbal supplements, or other prescription medications).</i>		
<i>IA2: I know what to do if I miss a dose of any of my HIV medications (for example, whether or not to take the pill(s) later).</i>	0.65	0.57
<i>IA3: Skipping a few of my HIV medications from time to time would not really hurt someone's health.</i>		
<i>IA4: I know what the possible side effects of each of my HIV medications are.</i>	0.78	0.48
<i>IA5: As long as someone is feeling healthy, missing some HIV medications from time to time is OK</i>		
<i>IA6: I understand how each of my HIV medications works in my body to fight HIV.</i>	0.65	0.95
<i>IA7: If someone does not take their HIV medications as prescribed, the medications may not work for them in the future.</i>		
<i>IA8: If people take their HIV medications as prescribed, they will live longer.</i>	0.40	0.75
<i>IA9: I know how my HIV medications interact with alcohol and street drugs.</i>	0.59	1.06
MOTIVATION^b		
Personal motivation		
<i>MA1: I am worried that other people might realize that I am HIV+ if they see me taking my HIV medications (R).</i>	0.34	2.23
<i>MA2: I get frustrated taking my HIV medications because I have to plan my life around them (R).</i>	0.65	1.32
<i>MA3: I don't like taking my HIV medications because they remind me that I am HIV+ (R).</i>	0.73	1.11
<i>MA7: It frustrates me to think that I will have to take these HIV medications every day for the rest of my life (R).</i>	0.73	0.94
Social motivation		
<i>MA4: I feel that my healthcare provider takes my needs into account when making recommendations about which HIV medications I take.</i>	0.77	0.58
<i>MA5: Most people who are important to me who know I'm HIV positive support me in taking my HIV medications.</i>	0.38	0.96
<i>MA6: My healthcare provider doesn't give me enough support when it comes to taking my medications as prescribed (R).</i>	0.75	0.69
BEHAVIORAL SKILLS^c		
<i>BA1: There are times when it is hard for me to take my HIV medications because I drink alcohol or use street drugs.</i>		
<i>BA2: How hard or easy is it for you to stay informed about HIV treatment?</i>		
<i>BA3: How hard or easy is it for you to get the support you need from others for taking your HIV medications (for example, from friends, family, doctor or pharmacist).</i>		
<i>BA4: How hard or easy is it for you to get your HIV medication refills on time?</i>		
<i>BA5: How hard or easy is it for you to take your HIV medications when you are wrapped up in what you are doing?</i>		
<i>BA6: How hard or easy is it for you manage the side effects of your HIV medications?</i>	0.55	1.04
<i>BA7: How hard or easy is it for you to remember to take your HIV medications?</i>	0.80	0.38
<i>BA8: How hard or easy is it for you to take your HIV medications because the pills are hard to</i>	0.76	0.73

Item	Factor loading	Residual
swallow, taste bad, or make you sick to your stomach?		
BA9: How hard or easy is it for you to make your HIV medications part of your daily life?	0.90	0.25
BA10: How hard or easy is it for you to take your HIV medications when your usual routine changes (for example, when you travel or when you go out with your friends)?	0.77	0.61
BA11: How hard or easy is it for you to take your HIV medications when you <u>do NOT feel good emotionally</u> (for example, when you are depressed, sad, angry, or stressed out)?	0.81	0.67
BA12: How hard or easy is it for you to take your HIV medications when you <u>feel good physically</u> and don't have any symptoms of your HIV disease?	0.73	0.55
<i>BA13: How hard or easy is it for you to take your HIV medications when you <u>do NOT feel good physically</u>?</i>		
BA14: If you had trouble taking some of your HIV-medications, how hard or easy is it (or would it be) for you to talk to your health care provider about it?	0.57	0.85

Note: Items in italics were removed in scale revision.

^a Model fit: $\chi^2 = 16.12$, $df = 5$, $p = .007$; CFI = 0.94; TLI = 0.88; RMSEA = 0.09 (90% CI = 0.04, 0.13)

^b Model fit: $\chi^2 = 28.81$, $df = 13$, $p = .007$; CFI = 0.96; TLI = 0.93; RMSEA = 0.06 (90% CI = 0.03, 0.09)

^c Model fit: $\chi^2 = 40.55$, $df = 20$, $p = .004$; CFI = 0.98; TLI = 0.97; RMSEA = 0.06 (90% CI = 0.03, 0.08)

Table 3Pearson correlations between scale scores and descriptive statistics ($n=310$)

<i>Scale</i>	<i>Scale no.</i>			
	1	2	3	4
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
1. Information (new)	1.00			
2. Social motivation	0.39	1.00		
3. Personal motivation	0.26	0.30	1.00	
4. Behavioral skills (new)	0.44	0.45	0.58	1.00
M (SD)	4.22 (0.80)	4.24 (0.91)	2.84 (1.10)	3.61 (0.92)
Range	1 – 5	1 – 5	1 – 5	1.13 – 5
α	0.75	0.65	0.69	0.90

Note: All correlations statistically significant at $p<.05$