2010

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Citation/Publisher Attribution
Blissmer, B., Prochaska, J. O., Velicer, W. F., Redding, C. A., Rossi, J. S., Greene, G. W., … Robbins, M. (2010). Common Factors Predicting Long-term Changes in Multiple Health Behaviors. *Journal of Health Psychology, 15*(2), 205–214. https://doi.org/10.1177/1359105309345555
Available at: https://doi.org/10.1177/1359105309345555

Published in final edited form as:
J Health Psychol. 2010 March ; 15(2): 205–214. doi:10.1177/1359105309345555.

Common Factors Predicting Long-term Changes in Multiple Health Behaviors

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Abstract

This study was designed to assess if there are consistent treatment, stage, severity, effort and demographic effects which predict long-term changes across the multiple behaviors of smoking, diet and sun exposure. A secondary data analysis integrated data from four studies on smoking cessation (N = 3927), three studies on diet (N = 4824) and four studies on sun exposure (N = 6465). Across all three behaviors, behavior change at 24 months was related to treatment, stage of change, problem severity and effort effects measured at baseline. There were no consistent demographic effects. Across multiple behaviors, long-term behavior changes are consistently related to four effects that are dynamic and open to change. Behavior changes were not consistently related to static demographic variables. Future intervention research can target the four effects to determine if breakthroughs can be produced in changing single and multiple behaviors.

Keywords

diet; multiple behaviors; severity and effort effects; smoking; stage; sun exposure; treatment

As healthcare costs continue to escalate, greater attention is being paid to those individuals that are costliest to the healthcare system, namely individuals with multiple risk factors (Edington, 2001; Pronk, Peek, & Goldstein, 2004). There has been an increasing amount of research attention devoted to understanding how to change multiple health behaviors including recent special issues in the *American Journal of Preventive Medicine* and *Preventive Medicine*, with some calling multiple health behavior research the future of preventive medicine (Prochaska, 2008). To develop interventions to impact upon multiple behaviors, we first need to develop theory to help guide us in selecting and developing intervention strategies (Glasgow, Goldstein, Ockene, & Pronk, 2004; Goldstein, Whitlock, & DePue, 2004; Noar, Chabot, & Zimmerman, 2008). There are numerous studies on the predictors of success in changing single behaviors; however, we need to examine commonalities between factors related to successful maintenance across behaviors as tools for understanding how to build more effective multiple behavior interventions.

Most research has focused on treatment effects with the expectation that individuals randomly assigned to treatment will demonstrate significantly greater behavior changes at long-term follow-ups. A wealth of research supports treatment effects for single behaviors (e.g. 6000 studies on smoking cessation (Fiore et al., 2000)). One important factor is whether or not

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COMPETING INTERESTS: None declared.

individuals receive tailored interventions to help them change their behavior. A recent meta-analysis found tailored interventions to be effective at changing a variety of health behaviors (Noar, Benac, & Harris, 2007). Until recently, however, there was little programmatic research demonstrating treatment effects of tailored interventions with multiple behaviors (Prochaska et al., 2004b, 2005). However, we know from intervention studies that not all of the intervention subjects change their behavior and assessment only control groups typically show a significant amount of change that by definition cannot be a function of treatment effects. Obviously, there are several other potential common factors related to behavioral change and maintenance across multiple behaviors that need to be examined.

An individual's stage of change may be another potential common predictor of successful maintenance of behavioral change. This primarily reflects their behavioral intentions to change and may also include some behavioral components at later stages (Prochaska et al., 1994). We would expect that individuals that express greater intentions to change may be more likely to be successful at changing and maintaining that change. In previous research on smoking cessation, we found stage effects in treatment and control groups. Smokers in the preparation stage at baseline reported more cessation at six, 12 and 18 months follow-up than smokers in contemplation who reported more cessation than smokers in the precontemplation stage (Prochaska, Velicer, Prochaska, & Johnson, 2004a). Meta-analysis across multiple behaviors has confirmed that having an intention to change behavior is vital to promoting change; without a positive intention to change only 7 percent of people take action (Sheeran, 2002). However, intention alone is not sufficient to explain behavior change since the same meta-analysis found that only 47 percent of those with positive intentions actually do take action.

Another potential common factor in predicting successful maintenance of health behavior change is the discrepancy between an individual's current risk behavior and the criterion behavior. This discrepancy effects problem severity. In essence, the prediction is that people that need to make greater changes are less likely to be successful in reaching the criterion. Work in the addictions field and smoking cessation has found that the problem severity is inversely related to success (Breslau & Johnson, 2000; Falba, Jofre-Bonet, Busch, Duchovny, & Sindelar, 2004). In previous research on smoking cessation, we also found severity effects in treatment and control groups, with less severe smokers at baseline reporting more cessation than heavier smokers and those who smoked their first cigarette earlier in the morning quitting less (Velicer, Redding, Sun, & Prochaska, 2007b). We need to extend these results to examining problem severity effects across multiple behaviors.

In a multiple behavior context, it is important to realize that different health behaviors have markedly different behavior change requirements. Smoking requires extinction of a 'negative' behavior and success is defined as movement to zero cigarettes, an absolute goal. Dietary change involves making changes on a meal by meal basis to achieve a less readily observed goal such as fewer than 30 per cent of caloric consumption from fat. This is therefore not an extinction behavior, but requires changes on an ongoing, daily basis. Risky sun exposure is a behavior that may occur with less frequency and requires strategies to either avoid exposure or take protective measures to limit risk (wearing sunscreen, proper clothing, etc.).

An additional factor that may predict successful maintenance of behavior change across multiple behaviors is how hard individuals are working at changing their behavior (i.e. their behavior change effort). Within the framework of the Transtheoretical Model (TTM), the effort they are exerting may be captured by their use of the processes of change, which should in turn influence their decisional balance and confidence to perform the behavior. A recent meta-analysis has demonstrated that decisional balance items show remarkably consistent patterns of change across the stages of change for multiple behaviors (Hall & Rossi, 2008). However,

this work is based on cross-sectional data and needs to be extended by examining effects across behaviors over time.

A final potential common factor that may predict successful maintenance is that certain subgroups may simply be more likely to change their behavior. We know that demographic variables such as age, gender, marital status, ethnicity, income and education are related to the prevalence of health-related behaviors (Harper & Lynch, 2007; Pleis & Lethbridge-Cejku, 2007). Therefore, it is possible that these factors may also predispose an individual to be more (or less) successful at initiating and maintaining health behavior changes.

This study will examine the ability of the common factors of treatment, stage, problem severity, effort and demographics at baseline to predict successful maintenance at 24 months across three different health behaviors. The significant contribution of this study will be the ability to jointly examine these common factors across multiple health behaviors with a long-term follow-up by pooling several large intervention data sets.

Methods

Samples

This study involves a secondary data analysis that combined data from five large population-based studies. Each study involved multiple intervention and control groups. Of the five samples below, two (Random Digit Dial (RDD) for smoking and Beach for sun exposure) focused on a single behavior within the intervention, while the others (Parent, Patient and Employees) intervened on multiple risk behaviors of smoking, diet and sun exposure.

RDD sample—This study employed Random Digit Dial (RDD) survey methodology to recruit a sample of 4144 smokers, representing 82 percent of approximately 5000 eligible smokers. Smokers were randomly assigned to: Assessment Only and Expert System (ES) on a 2 to 1 ratio. A total of 2571 were retained at 24 months and are included in this analysis. Additional details about the sample, recruitment and outcomes are available elsewhere (Prochaska, Velicer, Fava, Rossi, & Tsoh, 2001).

Parent—The sample consisted of parents of adolescents who were subjects in a school-based study. There was no interaction between the school-based and parent-based interventions. The 22 schools involved provided a list of parents. Based on the records provided by the schools in Rhode Island, a total of 3507 eligible households of students were identified. Households were contacted by phone and a total of 2931 respondents were contacted. One parent was recruited from each eligible household. Of these, 2460 parents agreed to participate and completed the baseline survey. Parents had to be at risk for at least one of the three risk factors to be eligible. Eighty-four percent (83.6%) of eligible participants were recruited. A total of 409 baseline smokers, 1254 at risk for diet and 1242 at risk for sun exposure were retained at 24 months and are included in this analysis. Additional details about the recruitment and outcomes are available elsewhere (Prochaska et al., 2004b).

Patient—A health insurance provider provided a list of 19,696 patient names for an expert system intervention study. The participants were patients of physicians that were part of a multiple risk behavior (smoking, diet, sun and mammography) physician and home intervention study. There was no interaction between home and physician interventions. Initial screening identified a total of 12,978 eligible households, who were contacted by phone. One patient was recruited from each eligible household. A total of 4439 patients refused participation and 65 percent of eligible participants were recruited. Of the 8539 patients who agreed to participate, 3157 were screened out, leaving a final sample of 5382 participants. A total of 772 smokers, 2603 at risk for diet and 2869 for sun exposure were retained at 24 months

and included in this study. Additional details about recruitment and outcomes are available elsewhere (Prochaska et al., 2005).

Employees—The employee sample was part of a larger multiple risk behavior study on smoking, diet, sun exposure and exercise. A total of 22 worksites provided subjects. There was no interaction between home and worksite interventions. Eighty-six (85.7%) percent of the eligible employees were recruited. A total of 175 smokers, 773 at risk for diet and 904 for sun exposure were retained at 24 months and are included in this study. Additional details about the recruitment and outcomes are available elsewhere (Velicer et al., 2004).

Beach—A total of 2324 individuals at risk for sun protective behaviors were recruited proactively at the beach. At 24 months, 1309 were retained and are included in this study. Additional details about the recruitment and outcomes are available elsewhere (Weinstock, Rossi, Redding, & Maddock, 2002).

Measures

Baseline demographics were available on gender, age, race and ethnicity, health status, marital status, education and income. Stage of change measures were available for each of the three baseline behaviors and all participants in this study had to be in the precontemplation, contemplation or preparation stages at baseline.

Problem severity measures—Number of cigarettes smoked is the single best item from Fagerstrom's (Fagerstrom, Heatherton, & Kozlowski, 1990) scale of severity of addiction. Diet severity was measured by total score on healthy eating behaviors, with lower scores reflecting a less healthy diet (Prochaska et al., 2004b, 2005). Sun exposure severity was measured by seven items assessing amount of time spent in the sun and amount of protection used when exposed to the sun, with lower scores reflecting less healthy sun exposure (Weinstock et al., 2002).

Effort measures—For each behavior, effort at baseline was measured by frequency of use of TTM experiential processes of change which combine five covert strategies applying cognitive, affective and evaluative techniques. Also measured were TTM behavioral processes which combine five overt strategies applying reinforcement, counterconditioning, stimulus control, helping relationships and commitment techniques. Processes of change scales for smoking cessation varied in the number of items, so item scores are reported. For diet and sun exposure, 10-item scales for experiential and behavioral processes were used, so scale scores are reported for behaviors.

To minimize subject burden, the processes of change measures were collected only for intervention purposes, so data are for treatment groups only. Therefore, to be able to include control subjects in the analyses we also used measures of decision-making variables, the pros and cons of changing and confidence/temptation as proxy measures of effort. For decisional balance, item scores are reported for smoking and diet on treatment groups only, while scale scores for the combined groups are reported for sun exposure. As indicated in Table 3, the pros of changing measure was used for sun exposure, while the converse, pros of the behavior, was used for smoking and diet. Similarly, the cons of changing measure was used for sun exposure and the converse, cons of the behavior, was used for smoking and diet.

The confidence version of self-efficacy was used for sun exposure, while the converse of temptations was used for smoking and diet. As indicated in Table 3, the scores are in the opposite direction with high confidence and low temptations reflecting better efforts.

Treatment—All studies utilized a common TTM-tailored expert system intervention that was printed and delivered to their homes. Participants also received stage-matched self-help manuals that were for single or multiple behaviors depending on the study.

Outcome measures—Positive outcomes at 24 months were measured by the percentage of each group who progressed to the Action (A) or Maintenance (M) stages. This outcome represents those who had progressed from being at risk (below public health criteria) to being at low risk (at or below the criteria), such as progressing from high fat (> 30% of calories from fat) to low fat diet. Improvement alone, such as reducing the number of cigarettes smoked or progressing in the early stages of change, was not counted as long-term success.

Analysis plan

The analyses here focused on the individual variables rather than the development of a multivariate prediction model. The goal of chi-squared (categorical variables) and ANOVA (continuous variables) was to assess the degree of relationship between each variable and 24-month outcomes. Table 2 presents the proportion of participants who reached Action or Maintenance stage for each behavior for each of the variables along with effect size estimates (Cramer's Φ^2) for each variable. Table 3 presents the comparisons between participants in and not in action or maintenance at 24 months on their baseline means and effect sizes (ω^2) for the continuous severity and effort variables. Effect size estimates are interpreted using guidelines for small (.01), medium (.06) and large (.14) effects developed by Cohen (1988).

Results

Demographics on the combined samples for each behavior are presented in Table 1. Of the combined samples, 3927 were smokers at baseline, 4630 were at risk for diet and 6324 for sun exposure.

Table 2 shows that for each of the three behaviors, the treatment groups had significantly more participants who progressed to Action or Maintenance at the 24-month follow-up. The effect sizes were small. Within each of the three behaviors, participants in precontemplation at baseline had the smallest percentage in Action or Maintenance at 24 months, and those in preparation had the highest percentage. The effect sizes ranged from small for smoking to moderate for diet and sun.

No consistent demographic effects were found across the three behaviors. Females progressed to Action or Maintenance significantly more at 24 months for diet and sun exposure, but not smoking. The oldest group quit smoking and changed their diets the most, while the youngest group progressed to Action or Maintenance the least for sun exposure. Individuals who were not married at baseline were the least likely to progress to Action or Maintenance for smoking or sun exposure, but not diet. The only effect of race and ethnicity was that Hispanic Americans progressed the most toward Action or Maintenance for sun exposure. The only effect of health status was that those with very good or excellent health changed their diets the most. Surprisingly, there were no significant effects related to income or employment status. Table 2 shows that the effect sizes were small for all demographic variables.

As shown in Table 3, for each of these behaviors, those in Action or Maintenance at 24 months had better severity baseline scores as measured by number of cigarettes smoked, total unhealthy eating behaviors and time spent in the sun without adequate protection. The effect sizes ranged from small for smoking to moderate for diet and sun.

For each of the three behaviors, those in Action or Maintenance at 24 months were applying the experiential and behavioral processes of change significantly more at baseline. Those in

Action or Maintenance at 24 months for smoking and diet had significantly lower pros for the behaviors, while for sun exposure the pros of changing were significantly higher. Those in Action or Maintenance for diet had significantly lower cons for the behavior, while those for sun exposure had higher cons for changing the behavior. For smoking the temptations version of self-efficacy was significantly lower at baseline for successful smokers and for sun exposure the confidence version was higher for those in Action or Maintenance at 24 months. No effect was found for the diet temptation measure. As Table 3 shows, the effect sizes for the effort effects ranged from small to moderate.

Discussion

The results demonstrate that there are consistent predictors of successful maintenance of health behavior change across three very different health behaviors. Specifically, there was support for treatment effects, stage effects, problem severity effects and effort effects for smoking, diet and sun exposure. There was no consistent support for demographic effects across the three behaviors. So although demographic factors may relate to prevalence, they do not appear to differentially predict successful maintenance. The smallest effect sizes were for demographics; the largest were for stage; and the other three ranged from small to moderate effects.

Although the effects are not large, taken together they provide important evidence about common factors that underlie multiple behavior changes. Only one of the four effects, treatment, is unique to treatment conditions. These results can help us understand why and how control groups show behavior change over time. Future work in the area needs to address the interaction of factors such as stage, demographics and effort with treatment to further refine our interventions. For example, recent research has shown that when we control for stage effects by examining just a single stage, there are important effort effects (Anatchkova, Velicer, & Prochaska, 2006; Velicer, Redding, Anatchkova, Fava, & Prochaska, 2007a).

What is most encouraging is that the four consistent effects are all open to change, while the inconsistent demographic effects are not. There is growing knowledge of how to help people progress through the stages (Dijkstra, Conijn, & de Vries, 2006). There is also growing knowledge of how to effectively reduce baseline severity of problems like smoking (e.g. the use of Nicotine Replacement Therapy (NRT) or motivational interviewing (MI) to reduce the number of cigarettes smoked (Carpenter, Hughes, Solomon, & Callas, 2004)), which can perhaps be applied to the diet and sun exposure areas (e.g. start by changing some food preparation habits, limiting exposure on weekends, etc.). Finally, there is growing knowledge of how to provide tailored feedback to help guide individuals to make better efforts with change variables like the processes of change and decisional balance (Noar et al., 2007). Future breakthroughs in changing multiple behaviors may emerge from interventions designed to maximize each of the four effects that predict long-term outcomes (Glasgow et al., 2004; Goldstein et al., 2004).

Limitations

The heterogeneity of the combined samples may be viewed as a limitation, because of the uncontrolled variance or noise that is introduced. There was also heterogenity in some of the measures, such as the pros and cons of changing and the pros and cons of the behavior and self-efficacy measured by confidence or temptations. Such heterogeneity may also be viewed as a strength, since the four effects have to produce signals that are robust enough to be clearly detected in the context of considerable noise. Also, the effects have to be robust enough to be detected across three very different behaviors.

This study is also limited to the use of one type of treatment, printed TTM-tailored communications. It is also possible that more representative samples would demonstrate clearer demographic effects.

This study is also limited to assessing each of the four effects separately without examining the relationships between the four effects (Abrams, Herzog, Emmons, & Linnan, 2000; Shiffman, 1996). It is possible that our interventions are working best with individuals at certain stages or within certain demographic subpopulations. While future research can expand upon the moderator literature that has examined such relationships within single behaviors (e.g. Kremers, de Bruijn, Droomers, van Lenthe, & Brug, 2007; Strecher, Shiffman, & West, 2006), it is important to first demonstrate the consistency across multiple behaviors for each of these four important effects.

Conclusion

Results from this integrative study across three behaviors support the conclusion that treatment, stage, problem severity and effort effects are consistently related to long-term behavior change. Treatment research can determine whether interventions designed to enhance one or more of these effects can provide breakthroughs in our impacts on multiple behaviors targeted in entire populations.

Acknowledgments

This study was supported by NIA Grant AG 024490–01A2, and NCI grants, CA 50087, CA 27821, CA 85990 to James Prochaska, PhD, and NCI grant CA85999 to Wayne Velicer, PhD and NCI grant AR 430521 to Martin Weinstock, MD and ACS grant MSRG-05–092–01-CPPB to Bryan Blissmer, PhD.

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Biographies

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JOSEPH S. ROSSI, PhD, is the Director of Research at the Cancer Prevention Research Center and Professor in the Department of Psychology. Dr Rossi has been extensively involved in adapting Transtheoretical Model measures and interventions to a wide range of behaviors.

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MARK L. ROBBINS, PhD is an Associate Professor in the Psychology Department and at the Cancer Prevention Research Center (CPRC) at the University of Rhode Island. He has taken a disease management approach to applying the Transtheoretical Model of behavior change (TTM) to organ donation and transplantation, stress management and multiple risk factor interventions for cancer prevention.

Table 1

Baseline demographics of current sample

Variables	Smoking N (%)	Diet N (%)	Sun N (%)
Stage			
PC	2556 (39.9)	2381 (52.0)	2203 (34.8)
C	2651 (41.4)	695 (15.2)	1463 (23.1)
Prep	1200 (18.7)	1506 (32.9)	2659 (42.0)
Gender			
Male	1538 (39.2)	1636 (35.7)	2203 (35.9)
Female	2389 (60.8)	2946 (64.3)	3936 (64.1)
Age			
34 and younger	1168 (29.9)	832 (18.3)	1556 (26.3)
35–49	1794 (45.9)	2606 (57.2)	2849 (48.1)
50–64	743 (19.0)	913 (20.1)	1249 (21.1)
65 and older	206 (5.3)	201 (4.4)	267 (4.5)
Race			
White	3749 (96.2)	4321 (95.8)	5758 (95.6)
Black	75 (1.9)	60 (1.3)	81 (1.3)
Asian, Pacific Islander	11 (0.3)	30 (0.7)	50 (0.8)
American Indian Alaskan	15 (0.4)	22 (0.5)	27 (0.4)
Other	48 (1.2)	77 (1.7)	109 (1.8)
Marital status			
Married	2317 (61.9)	3319 (73.6)	3431 (56.8)
Not married/Living with partner	175 (4.7)	137 (3.0)	152 (2.5)
Not married	540 (14.4)	420 (9.3)	1089 (18.0)
Separated	114 (3.0)	73 (1.6)	104 (1.7)
Divorced	549 (14.7)	443 (9.8)	1034 (17.1)
Widowed	50 (1.3)	120 (2.7)	232 (3.8)
Health status			
Poor	75 (1.9)	56 (1.2)	60 (1.0)
Fair	433 (11.1)	507 (11.2)	487 (8.0)
Good	1246 (31.9)	1791 (39.6)	1942 (32.1)
Very good	1477 (37.9)	1637 (36.2)	2352 (38.9)
Excellent	670 (17.2)	527 (11.7)	1210 (20.0)

Table 2

Percentage in Action/Maintenance at 24 months for each behavior by baseline treatment, stage and demographic variables

	24 months % in action/maintenance		
Variables	**Smoking N (%)**	**Diet N (%)**	**Sun N (%)**
Condition			
Treatment group	353 (25.1)	482 (23.24)	665 (22.77)
Control group	484 (19.2)	421 (16.87)	442 (12.80)
χ^2	*18.32***	*28.95***	*104.41***
Cramer's Φ^2	*.005*	*.006*	*.016*
Stage			
PC	229 (15.0)	379 (15.93)	153 (6.94)
C	373 (22.5)	124 (18.00)	134 (9.20)
Prep	235 (31.4)	400 (26.65)	820 (30.80)
χ^2	*82.31***	*68.27***	*568.12***
Cramer's Φ^2	*.021*	*.015*	*.090*
Gender			
Male	315 (20.5)	240 (14.64)	323 (14.66)
Female	522 (21.9)	663 (22.63)	755 (19.18)
χ^2	*1.05*	*42.26***	*19.94***
Cramer's Φ^2	*.000*	*.009*	*.003*
Age			
34 and younger	259 (22.2)	139 (16.71)	212 (13.60)
35–49	365 (20.3)	507 (19.52)	547 (19.22)
50–64	147 (19.8)	209 (22.94)	234 (18.74)
65 and older	63 (30.6)	43 (21.72)	44 (16.50)
χ^2	*13.10**	*11.27**	*23.38***
Cramer's Φ^2	*.003*	*.002*	*.004*
Marital status			
Married	483 (20.85)	652 (19.70)	661 (19.27)
Not married/Living with partner	47 (26.86)	25 (18.25)	32 (21.05)
Not married	120 (22.22)	83 (19.86)	136 (12.49)
Separated	30 (26.32)	16 (21.92)	25 (24.04)
Divorced	107 (19.49)	88 (19.82)	166 (16.05)
Widowed	8 (16.0)	33 (27.73)	36 (15.52)
χ^2	*7.41*	*5.07*	*33.43***
Cramer's Φ^2	*.002*	*.001*	*.006*
Health status			
Poor	10 (13.3)	10 (17.86)	15 (25.00)
Fair	86 (19.9)	93 (18.34)	75 (15.40)
Good	255 (20.5)	319 (17.91)	349 (17.97)
Very good	324 (21.9)	362 (22.17)	432 (18.37)

	24 months % in action/maintenance		
Variables	**Smoking N (%)**	**Diet N (%)**	**Sun N (%)**
Excellent	154 (23.0)	113 (21.40)	189 (15.62)
χ^2	*5.39*	*11.35***	*8.30*
Cramer's Φ^2	*.001*	*.003*	*.001*

** $p < .01$;

* $p < .05$

J Health Psychol. Author manuscript; available in PMC 2010 September 27.

Table 3

Groups in Action/Maintenance at 24 months compared to groups in Pre-action stages on baseline severity and effort variables

			M (SD)		
Baseline variables	**24-month outcome**		**Smoking**	**Diet**	**Sun**
Cigarettes/day					
	N= 837	A/M	16.24 *(10.50)*		
	N= 3086	Pre-action	20.45 (*11.33*)		
		F	*93.52***		
		ω^2	*.02*		
Diet behaviors—total					
	N= 866	A/M		79.37 (*9.94*)	
	N= 4067	Pre-action		70.85 (*11.44*)	
		F		*422.80***	
		ω^2		*.09*	
Sun behaviors—total					
	N= 1107	A/M			24.45 *(3.50)*
	N= 5218	Pre-action			19.72 *(5.21)*
		F			*835.95***
		ω^2			*.12*
Pros					
(Pros of behavior—Smoking & Diet)		A/M	2.42 (*.90*)	2.13 *(.94)*	4.06 *(.71)*
(Pros of changing—Sun)		Pre-action	2.59 (*.92*)	2.31 (*.96*)	3.53 *(.92)*
		F	*23.67***	*30.78***	*327.97***
		ω^2	*.006*	*.007*	*.049*
Cons					
(Cons of behavior—Smoking & Diet)		A/M	3.31 (*.99*)	2.30 *(1.10)*	2.50 *(.94)*
(Cons of changing—Sun)		Pre-action	3.23 (*1.04*)	2.27 *(1.07)*	2.86 *(.98)*
		F	*3.62*	*0.90*	*131.00***
		ω^2	*.001*	*.000*	*.020*
Self-efficacy					
(Temptations—Smoking & Diet)		A/M	3.20 (*.71*)	2.69 *(.75)*	3.24 *(.70)*

Baseline variables	24-month outcome		M (SD) Smoking	Diet	Sun
(Confidence—Sun)		Pre-action	3.41 (*.72*)	2.72 *(.78)*	2.48 *(.81)*
		F	*57.04***	*1.12*	*838.36***
		ω^2	*.014*	*.000*	*.117*
Experiential processes					
		A/M	3.11 *(.82)*	3.50 *(.80)*	3.55 *(.72)*
		Pre-action	3.02 *(.83)*	3.22 *(.88)*	3.11 *(.76)*
		F	*6.72**	*46.69***	*193.34***
		ω^2	*.002*	*.022*	*.051*
Behavioral processes					
		A/M	2.42 *(.73)*	3.54 *(.70)*	3.20 *(.58)*
		Pre-action	2.22 *(.72)*	3.24 *(.78)*	2.73 *(.65)*
		F	*38.85***	*66.01***	*313.61***
		ω^2	*.012*	*.001*	*.081*

** $p < .01$;

* $p < .05$