

Center

HEALTHY MONDAY:
TWO LITERATURE REVIEWS

for a
Livable
Future

Center for a Livable Future
Johns Hopkins School of Public Health

Healthy Monday: Two Literature Reviews

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About the Johns Hopkins Center for a Livable Future

Founded in 1996, the Johns Hopkins Center for a Livable Future promotes research and communicates information about the complex interrelationships among diet, food production, the natural environment and human health. As an interdisciplinary center it serves as a resource to solve problems that threaten the health of the public and hinder our ability to sustain life for future generations.

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Introduction

In our society, Monday is a special day in terms of status and opportunity – not only because it is the first day of the workweek, but also because it is a reliable and recurring vantage point within our calendar cycle from which people can begin or renew their commitment to improve their health behaviors. Knowing this, Johns Hopkins Center for a Livable Future researchers wondered whether this insight would be useful for health communications experts as they design behavior change intervention campaigns.

This publication contains two literature reviews conducted by Jillian Fry, MPH and Roni Neff, PhD, MS. The first review focuses on periodic prompts and their effectiveness in health behavior interventions. The second paper explores the cultural significance of Monday and its potential use in health promotion programs.

Fry and Neff concluded that frequent periodic messages can be effective in changing a range of healthy behaviors, including diet and exercise. They also found that Monday as a day of the week holds significance within Western cultures and may serve as a valuable day to send periodic health messages. In the U.S., almost 70% of us view Monday as the first day of the week and it represents a common cultural experience with both positive and negative associations.

While many people refer to or sing about the “Monday blues,” Fry and Neff identified a number of websites, blogs and books that seek to reframe Monday as a positive experience and an opportunity to begin the week with a new perspective. A survey sponsored by the nonprofit Healthy Monday Campaigns found that more than half of 1,500 adults over age 25 viewed Monday as a day to “get their act together” or as a day for a fresh start. When asked what day they would most likely start a diet or exercise regimen, almost half chose Monday.

Health promotion interventions often lack a strategy for facilitating sustained behavior change. Fry and Neff suggest that future behavior change communication campaigns employing various methods of communication, such as periodic prompts on the first day of the week, could improve the understanding of the most effective ways to foster long-term behavior change.

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Part One - Periodic-Prompt Characteristics and Effectiveness in Health Behavior Interventions: A Review

Abstract

Background: Health behavior interventions using periodic prompts have utilized technology, such as the Internet, that allows messages to be sent to participants in cost-effective ways. To our knowledge, no comprehensive evidence review has been performed specifically to evaluate the effectiveness of communicating regular messages and to examine how characteristics of the prompts change the effectiveness of programs aimed at reminding people to adopt healthy behaviors, maintain those they already practice, and cease unhealthy behaviors.

Objective: A systematic literature review was performed to investigate the effectiveness of limited contact interventions targeting weight loss, physical activity, and/or diet that provided periodic prompts regarding behavior change for health promotion. The review sought to identify specific characteristics of these interventions that may be associated with superior results.

Methods: Electronic literature searches were performed between February and April 2008. Articles were included if periodic prompts were used as an intervention or a component of an intervention, a behavioral or biological outcome measure was used, and an ongoing health promotion behavior was targeted. A rating system was applied to each study to provide a quantitative representation of the quality of the evidence provided by each article.

Results: There were 19 articles with a combined sample size of 15,655 that met the inclusion criteria, and 11 studies reported positive findings regarding the utility of periodic prompts. Several articles showed enhanced effectiveness when prompts were frequent and personal contact with a counselor was included. Long-term behavior change and health improvements were not examined by this review because of a lack of long-term follow-up in the literature.

Conclusions: In light of the promising results of most studies, additional research on limited contact interventions targeting health behaviors, such as weight loss, physical activity, and/or diet, is merited. Such a study would utilize rigorous methods including control groups, follow-up data collection, and testing of prompt frequencies, specific intervention components, or prompt characteristics. Future research would be especially valuable if it improves understanding of the most effective types of periodic prompts for fostering long-term behavior change in order to maximize use of this tool in limited contact health promotion programs. Specifically, various types of communication technology should be used and evaluated to expand and refine their use.

This review article was published in the Journal of Medical Internet Research (volume 11, number 2).

Introduction

Periodic prompts that encourage healthy behaviors are a way to remind and help motivate people to change their health behaviors. We define periodic prompts as messages, reminders, or brief feedback communicated to participants multiple times over the duration of an intervention. Prompts can be delivered at various intervals such as daily, weekly, or monthly, and can be sent using email, telephone, and mail. Health promotion professionals use periodic prompts both as stand-alone interventions and as components of interventions (Maibach & Holtgrave, 1995). Some interventions use personalization and tailoring in an attempt to increase the relevance of the prompts for recipients (Kreuter, Strecher & Glassman, 1999). Some programs also utilize counselors to communicate periodic messages, though this type of intervention requires more resources than interventions that are automated (Saywell et al., 1999). Although some people may recognize intuitively that it is valuable to communicate regular messages to remind people to initiate or maintain healthy behaviors, to our knowledge no comprehensive evidence review has been done specifically to evaluate the effectiveness of using periodic prompts and examine which characteristics of prompts work best in health promotion interventions. A review article published in 2001 examined interventions that used one or more computer-generated messages aimed at increasing medication adherence or immunization uptake and improving chronic disease management, as well as other health behaviors (Revere & Dunbar, 2001). This review builds upon that work by examining interventions targeting other health behaviors, evaluating the effect of periodic health prompts within health promotion interventions, and updating the literature.

A systematic literature review was performed to investigate the effectiveness of periodic prompts regarding behavior change and to identify specific characteristics of prompts that may be associated with superior results. The literature review was feasible because of the increasing use of limited contact interventions due to widespread access to the Internet and other media that are used to communicate prompts. Data from a Pew Internet and American Life Project survey in May 2008 revealed that 73 percent of U.S. adults go online, and 78 percent have cellular phones (Fox & Vitak, 2008). The impact that increased access to technology can have on an individual's health is great, and many organizations are recognizing the potential value of eHealth, which refers to "health services and information delivered or enhanced through the Internet and related technologies" (Eysenbach, 2001). Finding ways to implement behavior change interventions with large audiences in cost-effective ways is important because of the overwhelming challenges facing public health agencies and the limited resources available to meet them.

Health promotion studies using emerging technology are becoming more common, and researchers are tasked with balancing cost and personalization, and measuring the effects of those two competing characteristics on the interventions. The field of eHealth is rapidly growing (Robert Wood Johnson Foundation, 2009; World Health Assembly, 2005), with advantages regarding both cost and reach, and it is our hope that this review will serve to inform program development of eHealth interventions using periodic prompt messaging.

Methods

To identify peer-reviewed articles examining the use of periodic prompts for health promotion interventions, electronic literature searches were performed between February and April of 2008.

Databases and search tools accessed, with the number of articles found in initial searching, include PubMed (1119), PsycINFO (394), Google Scholar (142), CINAHL (148), and Web of Science (444). No publication date parameter was used to exclude older articles, and all searches included articles published up to the date of the search. Searches utilized the following terms in various combinations: prompt, weekly, reminder, email, Internet, Web-based, limited contact, intervention, health, and promotion. In addition, references of articles that were identified through searching were reviewed. Twenty-four additional articles were identified through this process.

Articles were included if periodic prompts were used as a stand-alone intervention or were part of a larger program; a biological or behavioral outcome measure was used; and ongoing health promotion behaviors such as weight loss, physical activity,

and diet were targeted. Studies aiming to change compliance with immunization or health screening guidelines were not included because of the intermittent nature of those activities. After reviewing titles and abstracts to identify relevant articles, reviewing references to locate additional articles, and applying the inclusion criteria, 19 articles were selected. A meta-analysis was not feasible due to the varying data collection methods and outcome measures.

A rating system was used to represent quantitatively the quality of the evidence provided by each article included in the review. The rating system was adapted from a review article that examined studies that used one or more computer-generated patient contacts aimed at increasing medication adherence or immunization uptake and improving chronic disease management, as well as other health behaviors (Revere & Dunbar, 2001). The authors of that review created the rating based on recommendations from the literature (Moher, Jadad, & Tugwell, 1996; Balas, Austin, Brown, & Mitchell, 1993). The rating system is described in Table 1, which is a modified version of a table in the review article (Revere & Dunbar, 2001). Articles were rated by the lead author, and the range of possible scores was 0 to 10. No minimum score was used to exclude studies from the review.

Table 1. Rating system

Factor	Description	Points
Randomization	Assignment to different interventions by chance	2
Control Group	Comparison made to group of subjects not given the health behavior intervention	2
Sampling	Sampling method described Sampling composition clearly described Sample of adequate size Number and ratio of withdrawals described	3
Analysis of Main Effect Variables	Clear definitions for each variable Clear description of methods and results Numeric table presented for each effect variable	1
Follow-up	Follow-up data collection to measure effects beyond immediate findings	1
Content	Intervention clearly described and replicable Discussion of withdrawals Discussion of study limitations	1

Results

This section describes the interventions, study designs, and main findings. The main findings are broken down into the following sections: prompt frequency, medium used, intervention components, tailoring, and level of interaction with intervention. Table 2 presents descriptive information, main findings, and a quality score for each article.

Table 2. Study characteristics, prompt characteristics, research questions, and findings

	Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
		N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
1	Block, G., Block, T., Wakimoto, P., & Block, C.H. (2004). Demonstration of an emailed worksite nutrition intervention program. <i>Preventing Chronic Disease, 1</i> (4), A06.	84	nutrition	12 weeks	observational, single group, pretest-posttest; set up to test effect of weekly emails and online tools in moving people forward in stage of change, decreasing fat intake, and increasing fruit and vegetable consumption	no	no	online tools: goal setting and bulletin board	weekly	email	yes, by lifestyle factors and chosen dietary behavior	positive association found between number of weeks a participant interacted and stage of change	<ul style="list-style-type: none"> responders not in action or maintenance stages at baseline: 65% progressed for fat reduction and 74% progressed in stage for fruit and vegetable consumption weeks a participant interacted with program related to change in stage decrease in dietary fat and increase in fruits and vegetables observed 	5

	Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
		N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
2	Conn, V.S., Burks, K.J., Minor, M.A., & Mehr, D.R. (2003). Randomized trial of 2 interventions to increase older women's exercise. <i>American Journal of Health Behavior, 27</i> (4), 380-8.	190	physical activity	3 months	randomized, four groups (2 x 2 design), pretest-posttest; set up to test effect of motivational interviewing and weekly prompts aiming to increase exercise; groups: (1) motivational interviewing and prompts, (2) motivational interviewing only, (3) prompts only, (4) control	yes	no	motivational interviewing	weekly	telephone and mail	none	n/a	<ul style="list-style-type: none"> prompted participants significantly increased their exercise compared to those not prompted motivational interviewing did not have a significant effect on amount of exercise 	9
3	Dinger, M.K., Heesch, K.C., Cipriani, G., & Qualls, M. (2007). Comparison of two email-delivered, pedometer-based interventions to promote walking among insufficiently active women. <i>Journal of Sports Science and Medicine, 10</i> (5), 297-302.	74	physical activity	6 weeks	randomized, two groups, pretest-posttest; set up to test effect of e-mails based on the transtheoretical model (TTM) on walking; second group wore pedometers, submitted step logs, and received weekly reminder emails; first group also received emails based on the TTM	no	no	pedometers and step logs	weekly	email	yes, by stage of change for intervention group (second group received non-tailored reminders)	n/a	<ul style="list-style-type: none"> both groups significantly increased amount of walking no difference between groups' amount of walking or stage movement. 	6

	Study Characteristics								Prompt Characteristics			Findings		Score (on a scale of 0 to 10)
	Article	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction	Summary of Results	
4	Dinger, M.K., Heesch, K.C., & McClary, K.R. (2005). Feasibility of a minimal contact intervention to promote walking among insufficiently active women. <i>American Journal of Health Promotion</i> , 20(1), 2-6.	43	physical activity	6 weeks	observational, one group, pretest-posttest; set up to test effect of intervention including pedometers, a brochure, and emails targeting TTM constructs on walking behavior and changes in TTM constructs	no	no	pedometers, step logs and brochures	weekly	email	none	n/a	<ul style="list-style-type: none"> total walking minutes significantly increased six of the TTM constructs measured improved, but self-efficacy was not effected 	4
5	Hunter, C.M., Peterson, A.L., Alvarez, L.M., et al. (2008). Weight management using the Internet: a randomized controlled trial. <i>American Journal of Preventive Medicine</i> , 34(2), 119-26.	446	weight	6 months	randomized, two groups, pretest-posttest; set up to test effect of a behavioral Internet intervention using online tools, two brief motivational interviewing phone calls, and personalized feedback compared to usual care	yes	no	online tools: self-monitoring tools for food and exercise, weight tracking chart, weekly lessons; two brief motivational interviewing phone calls	weekly	email	yes, a counselor provided weekly feedback by email	positive association found between use of intervention website and weight loss	<ul style="list-style-type: none"> intervention group lost more weight than usual care group, had significant BMI reduction, percent body fat reduction, and waist circumference reduction more weight loss was associated with more use of intervention website 	9

	Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
		N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
6	Jeffery, R.W., Sherwood, N.E., Brelje, K., et al. (2003). Mail and phone interventions for weight loss in a managed-care setting: Weight-To-Be one-year outcomes. <i>International Journal of Obesity and Related Metabolic Disorders</i> , 27(12), 1584-92.	1,801	weight	self-paced	randomized, three groups, pretest & two posttests; set up to test effect of an interactive 10-lesson intervention on weight loss where feedback was delivered by mail or telephone, compared to usual care	yes	yes	10 paper-and-pencil lessons	varied (self-paced)	telephone or mail	yes, personalized feedback from counselor by mail or telephone	n/a	<ul style="list-style-type: none"> • telephone group lost significantly more weight than usual care group at 6 months • 12 month differences were not significant for either treatment group • more agreed to take part in the intervention if in the mail group • higher percentage in phone group completed all lessons 	9
7	King, A.C., Taylor, C.B., Haskell, W.L., & Debusk, R.F. (1988). Strategies for increasing early adherence to and long-term maintenance of home-based exercise training in healthy middle-aged men and women. <i>American Journal of Cardiology</i> , 61(8), 628-32.	52	physical activity	6 months	randomized, two groups, pretest; set up to test effect of periodic phone calls on amount of exercise and level of oxygen consumption	yes	no	baseline exercise instruction session	every 2 weeks	telephone	yes, counselor provided further instruction and support through telephone calls	n/a	<ul style="list-style-type: none"> • oxygen consumption (VO2 Max) significantly better in intervention group • no difference in number of exercise sessions or duration between groups 	7

Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
<p>Lombard, D.N., Lombard, T.N., & Winnett, R.A. (1995). Walking to meet health guidelines: the effect of prompting frequency and prompt structure. <i>Journal of Health Psychology, 14</i>(2), 164-70.</p>	135	physical activity	12 weeks	<p>randomized, five groups (2 x 2 plus a control group), repeated measures; set up to test effect of prompting frequency (weekly versus every 3 weeks) and prompt structure (high versus low); five groups: (1) weekly prompts with high structure, (2) less frequent prompts with high structure, (3) weekly prompts with low structure, (4) less frequent prompts with low structure, (5) no prompts</p>	yes	yes	walking logs and instruction on how to start walking groups	weekly or every 3 weeks	telephone	<p>yes, counselor conducted a high structure prompt or low structure prompt</p>	n/a	<ul style="list-style-type: none"> groups that received weekly prompts walked significantly more than those prompted every 3 weeks (even after the intervention ended) prompt structure had no significant effect on amount of walking 	8

	Study Characteristics							Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
	Article	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
9	Marshall, A.L., Leslie, E.R., Bauman, A.E., Marcus, B.H. & Owen, N. (2003). Print versus website physical activity programs: a randomized trial. <i>American Journal of Preventive Medicine</i> , 25(2), 88-94.	655	physical activity	8 weeks	randomized, two groups, pretest-posttest; set up to test effect of (1) booklet with reinforcement letters and (2) a website with reinforcement emails to affect stage of change and increase physical activity	no	no	booklet or online tools: quizzes, goal setting, activity planning, and target heart rate guide	every 2 weeks	mail or email	yes, messages were tailored to stage of change	n/a	<ul style="list-style-type: none"> no significant difference in amount of physical activity found between groups participants inactive at baseline: both groups showed a positive change in total physical activity, but only significant for print group decreased time sitting on a weekday observed for both groups, only significant for Web group quarter of participants in both groups moved forward at least one stage 	6
10	Napolitano, M.A., Fotheringham, M., Tate, D., et al. (2003). Evaluation of an Internet-based physical activity intervention: a preliminary investigation. <i>Annals of Behavioral Medicine</i> , 25(2), 92-9.	65	physical activity	12 weeks	randomized, two groups, pretest & two posttests; set up to test effect of an intervention website based on the social cognitive theory with weekly emails on moving people forward in stage of change and increasing physical activity	yes	no	website based on the social cognitive theory	weekly	email	none	n/a	<ul style="list-style-type: none"> at one month, intervention group more likely to have moved forward in stage of change, had more moderate intensity minutes of exercise, and more walking minutes at 3 months, only minutes spent walking remained significant between intervention and control groups 	8

	Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
		N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
11	Petersen, R., Sill, S., Lu, C., Young, J., & Edington, D. (2008). Effectiveness of employee Internet-based weight management program. <i>Journal of Occupational and Environmental Medicine</i> , 50(2), 163-171.	7,743	weight	self-paced	observational, one group, pretest & two posttests; set up to test effect of a multicomponent online intervention on changing stage of change, dietary habits, exercise, and weight	no	yes	online tools: food and weight tracking tools, progress reports, weekly newsletters, community support, expert assistance, "SparkPoints"	weekly	email	yes, individualized messages were sent to help participants stay on course	positive association found between use of intervention website and weight loss	<ul style="list-style-type: none"> small, but statistically significant, positive changes in most dietary measures higher percentage of participants in normal weight category compared to non-participants, but no difference in average weight change increased website usage associated with more weight loss and stage of change improvement 	5
12	Plotnikoff, R.C., McCaragar, L.J., Wilson, P.M., & Loucaides, C.A. (2005). Efficacy of an email intervention for the promotion of physical activity and nutrition behavior in the workplace context. <i>Am J Health Promot</i> , 19(6), 422-9.	2,121	physical activity & nutrition	12 weeks	randomized, two groups, pretest-posttest; set up to test effect of email messages based on the social cognitive theory on physical activity, dietary changes, and social cognitive theory constructs	yes	no	weekly prompts only	weekly	email	none	n/a	<ul style="list-style-type: none"> intervention group found to be more active, have higher self-efficacy, perceive not being active as more of a threat to health, perceive more advantages and less disadvantages to being active, and have favorable changes in the dietary variables effect sizes were small 	9

Article	Study Characteristics						Prompt Characteristics			Findings		Score (on a scale of 0 to 10)	
	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction		Summary of Results
13 Spittaels, H.L., De Bourdeaudhuij, I., Brug, J., & Vandelanotte, C.. (2007). Effectiveness of an online computer-tailored physical activity intervention in a real-life setting. Health Education Research, 22(3), 385-96.	379	physical activity	8 weeks	randomized, three groups, pretest-posttest; set up to compare the effect of (1) computer-tailored online advice with five emails based on the stage of change theory, (2) tailored online advice with no emails, and (3) online advice only	no	yes	online physical activity advice	five messages over 8 weeks	email	yes, one group received messages tailored to stage of change	n/a	<ul style="list-style-type: none"> all groups increased their activity levels, but no differences were found between groups subgroup of participants who went through more thorough data collection: body fat significantly decreased in tailored plus email group tailored advice reported to be remembered, printed out, and discussed more with others more in tailored group reported to have changed their activity behavior after reading advice. 	9
14 Svetkey, L.P., Stevens, V.J., Brantley, P.J., et al. (2008). Comparison of strategies for sustaining weight loss: the weight loss maintenance randomized controlled trial. Journal of the American Medical Association, 299(10), 1139-48.	1,032	weight loss maintenance	30 months	randomized, three groups, pretest & five posttests; set up to compare effect of three conditions on weight loss maintenance: (1) monthly personal contact, (2) interactive technology-based intervention, (3) self-directed control group	yes	no	technology-based intervention: online tools-social support, self-monitoring, check-in accountability, problem solving and relapse prevention training; personal contact: met or spoke with interventionist monthly; control: pamphlet and one brief meeting with interventionist	weekly or monthly	email and/or telephone	yes, the personal contact group spoke or met with an interventionist monthly	n/a	<ul style="list-style-type: none"> first 24 months: both the intervention groups gained significantly less weight than the control group at 30 months: personal contact group regained significantly less weight than the other two groups interactive technology-based group was not statistically different from control group at 30 months 	9

Article	Study Characteristics					Prompt Characteristics			Findings		Score (on a scale of 0 to 10)		
	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring		Level of Interaction	Summary of Results
15 Tate, D.F., Jackvony, E.H., & Wing, R.R. (2006). A randomized trial comparing human email counseling, computer-automated tailored counseling, and no counseling in an Internet weight loss program. Archives of Internal Medicine, 166(15), 1620-5.	192	weight	6 months	randomized, three groups, pretest & two posttests; set up to compare effect of free weight loss website with no counseling to two counseling groups who had access to a more comprehensive weight loss website; the two counseling groups were (1) automated counseling and (2) feedback from a weight loss counselor	yes	no	online tools: weekly reporting and graphs, tips, recipes, e-buddy system, diary, message board, and behavioral lessons	weekly	email	yes, study compared groups that received no feedback, automated tailored counseling, or feedback from a counselor	positive association found between use of free website (among control group) and number of diary submissions (intervention group) and weight loss	<ul style="list-style-type: none"> at 3 months: two counseling groups did not differ from each other and had lost significantly more weight than website-only group at 6 months: human counseling group lost more weight than website-only group, and automated counseling group not significantly different from the other two groups greater use of free site associated with greater weight loss in the website-only group more diary submissions were associated with more weight loss in two counseling groups 	8
16 Tate, D.F., Jackvony, E.H., & Wing, R.R. (2003). Effects of Internet behavioral counseling on weight loss in adults at risk for type 2 diabetes: a randomized trial. Journal of the American Medical Association, 289(14), 1833-6.	92	weight	12 months	randomized, two groups, pretest; set up to compare effect of weight loss programs: (1) Internet only (2) Internet plus behavioral e-counseling (regular email communication with a counselor)	yes	no	one in-person counseling session, weekly weight, calorie and exercise reporting	weekly	email	yes, counseling group received personalized feedback	n/a	<ul style="list-style-type: none"> at 12 months: Internet plus e-counseling group lost more weight than the Internet-only group 	7

	Study Characteristics							Prompt Characteristics			Findings			
	Article	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction	Summary of Results	Score (on a scale of 0 to 10)
17	Tate, D.F., Wing, R.R., & Winett, R.A. (2001). Using Internet technology to deliver a behavioral weight loss program. <i>Journal of the American Medical Association</i> , 285(9), 1172-7.	91	weight	3 months	randomized, two groups, pretest & two posttests; set up to compare effect of weight loss programs: Internet education (had access to website with weight loss links) and Internet behavioral therapy (access to website plus weekly lessons, online diaries, bulletin board, and individualized therapist feedback)	yes	yes	one in-person group session; online tools: weight loss links, weekly lessons, online submission of self-monitoring diaries, and a bulletin board	weekly	email	yes, counseling group received personal feedback	n/a	<ul style="list-style-type: none"> behavioral therapy group lost more weight than Internet-only group at 3 and 6 months 	8
18	Williamson, D.A., Walden, H.M., White, M.A., et al. (2006). Two-year Internet-based randomized controlled trial for weight loss in African-American girls. <i>Obesity (Silver Spring)</i> , 14(7), 1231-43.	80	weight	12 months	randomized, two groups, pretest & four posttests; set up to compare the effect of a passive health education program (a few educational sessions and access to an informational website) and an interactive behavior therapy program (nutrition education and Internet counseling)	yes	yes	four in-person sessions, weekly lessons with quizzes, regular email communication with counselor, weight and activity graphs, and food intake monitoring tool	weekly	email	yes, counselor provided feedback on participant's progress with the program components	n/a	<ul style="list-style-type: none"> at 6 months: interactive behavior therapy group lost more body fat than passive education group at 24 months: no difference in weight between groups (the interactive group regained the lost weight) 	8

Article	Study Characteristics						Prompt Characteristics			Findings			
	N	Health Behavior	Intervention Duration	Study Design	Control Group	Follow-up	Additional Intervention Components	Prompt Frequency	Medium Used for Prompt	Tailoring	Level of Interaction	Summary of Results	Score (on a scale of 0 to 10)
19 Woodall, W.G., Buller, D.B., Saba, L., et al. (2007). Effect of emailed messages on return use of a nutrition education website and subsequent changes in dietary behavior. <i>Journal of Medical Internet Research</i> , 9(3), e27.	380	nutrition	4 months	observational, one group, pretest-posttest; set up to determine effect of an intervention consisting of an informational website and reminder emails alerting participants of new content on website	no	no	online tools: health benefit information, recipes, community directory, links related to fruit and vegetable intake	every 5 weeks	email	none	positive association found between responding to reminder emails and positive dietary change	<ul style="list-style-type: none"> participants were more likely to visit the site on the day a reminder e-mail was sent responding to reminder emails associated with positive dietary change including increased fruit and vegetable intake 	4

Descriptive Findings

The 19 articles were published between 1988 and 2008, with 17 of the studies published after the year 2000. Study sample sizes ranged from 43 to 7,743, with a median sample size of 190 participants. There was a total of 15,655 participants in the 19 studies described in the journal articles, of which 12,697 (81 percent) participated in the four largest studies. These four studies had sample sizes ranging from 1,032 to 7,743 and an average sample size of 3,174. Approximately 65 percent of all the subjects were women. While the largest study had 60 percent women, 14 of the 19 articles had more than 70 percent women, including four that included only women.

Randomized controlled trials made up 13 of the 19 studies (articles 2, 3, 5, 6, 7, 8, 10, 12, 14, 15, 16, 17, 18 in Table 2 [hereafter, article numbers refer to Table 2]). Six conducted follow-up data collection between three and 12 months post-intervention (articles 6, 8, 11, 13, 17, 18). Two studies used randomization for group assignment but did not include control groups (articles 3 and 9). Four studies were observational with only one group in each study (articles 1, 4, 11, 19). The range of the quality score scale is 0 to 10, and assigned scores for the 19 articles in this review range in value from 4 to 9. The four studies with scores of 4 or 5

(articles 1, 4, 11, and 19) did not include a control group, and therefore no randomization could take place (reducing the total possible points to 6). These studies are less informative because of their study designs, but they are included in this review because the interventions used periodic prompts and included outcome measures.

Eight of the interventions aimed to increase physical activity, seven focused on weight loss as the outcome, one was aimed at weight loss maintenance, two sought to improve dietary habits, and one focused on both physical activity and nutrition.

In terms of periodicity, 12 of the 19 studies sent prompts every week, and two studies sent prompts every two weeks. One program sent five prompts over eight weeks, and one sent them every five weeks. One study sent prompts at variable time periods, allowing participants to pace themselves and providing prompts as lessons were completed. Two interventions compared weekly prompts to prompts sent less frequently (e.g., every three weeks and monthly).

The type of periodic prompts, and the ways they were integrated with other intervention components, varied. The following are methods utilized in most studies. In terms of mode of prompt administration, 13 interventions sent only email prompts to participants, and two studies used only telephone prompts. Seven studies used only online tools in addition to prompts, and three articles used pedometers and step logs. Two studies used in-person sessions and online tools along with prompts. Some type of tailoring was used in 14 of the 19 studies to provide personalized information to participants as part of periodic prompts. Contact with a counselor was used in nine articles. Six studies reported on associations between the level of interaction participants had with the intervention and outcomes. Level of interaction with an intervention was measured as weeks a participant took part in the intervention, number of logins to the intervention website, or amount of use of the online tools on an intervention website.

Intervention length ranged from six weeks to 30 months. The median and mode intervention time span was three months (or 12 weeks), with five studies implementing interventions of this duration.

Main Findings

Of the 19 articles included in this review, 11 reported generally positive results regarding the use of periodic prompts (articles 1, 2, 3, 4, 5, 8, 12, 14, 15, 16, 17). This classification of study results as generally positive is based on whether periodic prompts themselves appeared to be supported, and not on whether the specific research questions the studies aimed to address were supported by the results.

The following section describes the articles' main findings regarding prompt characteristics. Results from studies that compared specific aspects of interventions between groups are described in each section. First, we discuss the findings regarding prompt frequency and how weekly prompts compare with other periodicities. Then, to supplement that analysis and understand the conditions under which periodic prompts may be more or less effective,

we examine the medium used for the prompt, intervention components, tailoring and level of interaction with intervention. As appropriate, some studies are described more than once. Table 2 provides information on the research questions the studies were designed to answer and the main findings reported.

Frequency of Prompt

In examining the effectiveness of periodic prompts, the first question is, what prompt frequency might be most effective? Only two studies specifically compared timing intervals for sending prompts. One intervention, aimed at increasing walking, sent prompts weekly to one group and every three weeks to another treatment group (article 8). Participants who were prompted every week walked for significantly more weeks than participants who were prompted less often (based on survival analysis), and this statistically significant difference was maintained over a three-month time frame post-intervention (Lombard, Lombard & Winett, 1995). In the second study examining periodicity, a weight-loss maintenance intervention used weekly and monthly prompts with two different treatment groups, but it is difficult to draw conclusions regarding frequency of communication from this study because the weekly messages were automated emails and the monthly contact was with a weight gain prevention counselor mostly by telephone (article 14). At 24 months, the two intervention groups did not differ by weight regained, and the participants in the treatment groups regained significantly less weight than the no-treatment control group (data not available to calculate effect sizes) (Svetkey et al., 2008). At 30 months, only the monthly personal contact group remained significantly better than the control group (Svetkey et al., 2008). At 30 months, the differences between the group that received weekly automated prompts and the control group were not statistically significant, and the difference between the two treatment groups was not statistically significant.

Medium Used for Prompt

The medium used to deliver periodic prompts may affect the outcome of a behavior change intervention. In a weight-loss intervention, the telephone group lost significantly more weight than the mail group at six months (0.12 kg difference [$P < .01$]), but at 12 months differences were not significant (article 6) (Jeffery et al., 2003).

The effects of a booklet with mailed reinforcements and a website with emailed messages on physical activity levels were compared (article 9). Both groups increased their activity, and there was no significant difference in amount of physical activity between the groups (Marshall, Leslie, Bauman, Marcus & Owen, 2003). Another study evaluated groups receiving telephone prompts, email prompts, and no prompts (article 14). One group received monthly personal contact mostly by telephone, the second intervention group had access to an interactive website and had to check in weekly, and the control group received no prompts (Svetkey et al., 2008). The two interventions were significantly better at preventing weight regain than the control through 24 months of data collection (data necessary to calculate effect size not reported). At 30 months, the personal contact group had regained less weight than both the interactive website group (0.21 kg difference [$P < .01$]) and the control group (0.27 kg difference [$P = .001$]), and the interactive website group was not significantly different from the control group (Svetkey et al., 2008). This result is hard to interpret, though, because the telephone group was receiving personal contacts and the email group's prompts were automated.

Intervention Components

Most of the interventions described in the articles used multifaceted approaches to change participants' behavior. Unfortunately, it is difficult to draw conclusions regarding effectiveness of prompts when additional components are used because no studies compared prompts alone to prompts with additional intervention tools.

Eight interventions included periodic prompts in association with online tools. Examples of tools used include quizzes, weight-tracking charts, goal setting, and bulletin boards. One study reported that participants with access to online tools, including periodic lessons and feedback, lost more weight than a group with access only to weight loss links at three months (0.84 kg difference [$P = .001$]) and six months (0.63 kg difference [$P < .05$]) (article 17) (Tate, Wing & Winnett, 2001). A similar study found that two groups assigned to a website with online tools, including periodic automated or counselor feedback, lost more weight at three months than a group assigned to a less comprehensive, free weight-loss site with periodic non-tailored email prompts (counseling group vs online tools only group 0.89 kg difference [$P = .001$] and automated feedback group vs online tools only group 0.65 kg difference [$P < .01$]) (article 15) (Tate, Jackvony & Wing, 2006). The difference between the periodic automated feedback and non-tailored email prompt group was not significant at six months, and only the group with periodic feedback from a counselor in addition to online tools had better weight loss results than the email prompt control group at six months (0.79 kg difference [$P < .001$]) (Tate et al., 2006). Finally, an intervention involving the extensive use of online tools and periodic personal feedback was compared to passive online education regarding weight loss (article 18). The periodic feedback and online tools group lost more body fat than the passive education group at six months (0.74 percent body fat difference [$P < .05$]), but the weight lost was gained back, and there was no significant difference between the groups at 24 months (Williamson et al., 2006).

Tailoring

Health promotion researchers hypothesize that sending participants personalized prompts relevant to their own situation or interest is more effective at changing behavior than generic reminders, and they have tested this idea (Kreuter & Wray, 2003). This section focuses on the results of studies that tested the effects of tailoring prompts in conjunc-

tion with periodicity of prompts. Prompts were tailored by personal contact with a counselor or automated online information personalized using information provided by participants.

An intervention aimed at increasing physical activity tested the effect of highly structured prompts compared to non-structured prompts (article 8). High-structure prompts consisted of a research staff member providing specific feedback to the participant based on the walking behavior information they submitted the week prior, and the staff member and participant together setting a specific walking goal for the next week. Low-structure prompts consisted of a research staff member asking the participants how their walking was going. The final survival analysis showed that the structure of the prompt had no significant effect on walking behavior, and that all prompted groups increased their walking (Lombard et al., 1995).

Monthly personal prompts, mostly by telephone, were compared to an online intervention with required weekly check-ins and no tailoring (article 14). Both were aimed at preventing weight regain, and a control group was included. At 24 months, both treatment groups gained significantly less weight than the control group (data needed to calculate effect size not reported), but at 30 months the personal contact group had regained significantly less than the control group (0.27 kg difference [$P < .01$]), and the online group was not significantly different from the control group (Svetkey et al., 2008).

A weight-loss intervention compared three groups: one received no feedback and had access only to a basic website; one received automated, tailored periodic prompts and had access to a comprehensive website; and a third group received periodic feedback from a counselor and had access to the comprehensive website (article 15). At three months the two groups receiving feedback did not differ, and both had lost significantly more weight than the no-feedback group (counseling group vs. online tools only group 0.89 kg difference [$P = .001$]; au-

tomated feedback group vs. online tools only group 0.65 kg difference [$P < .01$]) (Tate et al., 2006). At six months, the counselor feedback group had lost significantly more weight than the no-feedback group (0.79 kg difference [$P < .001$]), and the automated feedback group was not significantly different from either of the other two groups (Tate et al., 2006).

Level of Interaction with Intervention

Several studies reported differences in results in the frequency with which the participants responded to the periodic prompts or otherwise interacted with the intervention. Interaction can be measured by the number of emails opened, number of logins to the intervention website or number of weeks a participant remained in a program. Interpreting these findings is difficult because of the possibility that participants who were already motivated to change their behavior interacted with the intervention tools more than other participants.

A nutrition intervention found that the number of weeks a participant interacted with the program was significantly related to forward progression in stage of change (article 1). Two weight-loss studies that used periodic prompts reported that more weight loss was associated with more use of an intervention website (articles 5 and 11), which may have been increased because of prompting. In another study, greater use of a free website among a control group and more diary submissions by two counseling groups were found to be associated with greater weight loss (article 15). Finally, responding to periodic email prompts by visiting an intervention website was associated with positive dietary change in a nutrition intervention (article 19).

Discussion

Findings

Given 11 articles reporting generally positive effects of periodic prompts and eight articles reporting mixed results, the evidence that periodic prompts can effectively enhance diet, weight loss, and exercise behaviors appears to be positive but not entirely consistent. The few studies that looked at prompt frequency did show that it affected intervention effectiveness, with one study in particular demonstrating that weekly prompts were significantly more useful than prompts given every three weeks (article 8). Questions remain regarding how prompts issued more than once a week, or even every day, would affect behavior change because these frequencies were not tested in any of the studies. The medium used to communicate prompts did not affect results (if personal feedback was not added to the intervention) in the two studies testing different media for delivering prompts; both found no differences in effectiveness (articles 6 and 9).

It is difficult to evaluate findings regarding the effectiveness of prompts within multi-component interventions because prompts, and other elements, were not often explicitly tested. In addition, components included in multicomponent programs varied widely. Therefore, it is unknown if websites with more comprehensive sets of online tools are more effective at changing behavior than less comprehensive sites. When intervention components were implemented with one group and not another, often that was not the only difference between the groups. For example, if periodic prompts were also not communicated to the control group, then the effect of the intervention components was not tested. This makes it difficult to assess the value of individual intervention elements.

Tailoring periodic prompts through regular contact with a counselor produced positive results (articles 10, 16, 17, 19, 20, 23), especially when compared over time to groups not receiving personal contact (articles 14, 15, 17). Significant limitations regarding tailoring exist in the literature because often

groups provided with personalized periodic prompts were compared to groups that were not given any prompts (articles 7, 17, 18). Contact with a counselor over the phone or by email is an important form of periodic prompting to consider because health behavior counselors can serve many more clients by using methods other than face-to-face contact. This finding poses a challenge, though, to those who are designing limited contact interventions to be automated for cost-effectiveness and other reasons. Comparing automated prompts to regular counselor contact is important because programs using automated prompts that are implemented to save resources need to know which prompt characteristics produce effects as close to those using prompts given by counselors. Cost benefit analyses would be beneficial for further understanding optimal program choices.

More interaction by participants with the periodic prompt intervention program was associated with better outcomes in several studies (articles 1, 5, 11, 15, 19). The association found between more interaction with intervention components and better results could be a reflection of self-selection among the most motivated participants, or it could be that certain people were more engaged because of the intervention itself, and that resulted in better outcomes, or both.

Long-term, sustainable behavior change and health benefits are not shown by this review because of the lack of follow-up data collection and results in the literature. Two of the six studies that incorporated follow-up data collection showed non-significant or inconclusive results (articles 11 and 18). In addition, the articles that did collect follow-up data used heterogeneous methods in terms of cessation of prompts, outcome measures, and time period following the intervention, and were therefore difficult to compare.

All of the studies reviewed, except one, had participants who were recruited and volunteered to participate in the interventions. It is possible that those who volunteer for health interventions are already motivated to change their behavior and are open to the information being sent to them. If this is true, then results of limited contact interventions with prompts implemented broadly may have less positive outcomes than the ones included in this review. From an alternative perspective, providing interventions with prompts to facilitate behavior change among those who are motivated to improve their health would be a valuable service.

Related to the self-selection issue is the non-equivalent participation by males and females in the studies reviewed. Women may be more likely to volunteer for these types of studies, as is illustrated by the high proportion of participants who were female in the combined sample of all the studies in this review. Little is known about how effective these interventions would be at changing the behaviors of men. Most studies did not report on differences in results among men in their sample, and the men who volunteer for these studies may produce different results than men in the general population.

Finally, to prove effectiveness of an emerging type of intervention, data must be collected to evaluate the results. Many of the studies included in this review required participants to visit study staff for the data to be collected. Confounding arises due to a phenomenon known as the Hawthorne effect, which occurs when people change their behavior because they know they are being watched. It is possible that behavior change may be partially attributed to the fact that participants know they will need to return to a study site for data collection. If this is the case, and this type of contact is not part of the program when implemented on a large scale, then the results of the intervention could be weaker than the results from the initial study.

Limitations and Strengths of Studies

Multiple issues make it difficult to draw strong, generalizable conclusions about the effectiveness of limited contact interventions with prompts, including (1) a lack of follow-up, (2) self-selected samples, (3) a higher proportion of female participants, (4) a lack of rigorous testing of intervention factors, and (5) data collection methods that might differ when an intervention is implemented on a broad scale. The body of literature on periodic prompt interventions also has strengths. It has produced relatively consistent results, which show promise for this type of behavior change program. Control groups, randomization, and follow-up data collection were used in several studies, and those findings were therefore strengthened. In addition, several of the studies had large sample sizes.

Limitations and Strengths of Review

Despite using a thorough search strategy, there may be some literature on interventions using prompts that were not identified for this review. Specifically, we did not examine the gray literature (unpublished documents and reports) on this topic, focusing instead on data that had been through the peer-review process. A meta-analysis was not possible due to the various data collection methods and outcomes in the studies. Also, the variability in limited contact interventions regarding targeted behavior and methods utilized makes it difficult to develop generalized conclusions about their effectiveness.

Despite these limitations, this is the first literature review, to our knowledge, that examines the effectiveness of periodic prompts for changing diet, activity, and weight-loss behaviors. Insights regarding the effectiveness of prompts and possible ways to make them more effective are presented in an organized manner, and future research directions in this area are recommended based on this review.

Conclusions

In light of promising results from most studies, additional research on limited contact interventions is warranted. It would be valuable for further studies to use no-treatment control groups, include long-term follow-up data collection, and test specific intervention components or prompt characteristics instead of entire programs. In particular, further investigation into the effectiveness of different time intervals between prompts would be highly valuable. It would also be informative if researchers were able to include a more representative proportion of men in studies to see if they respond differently to these types of interventions.

New media has the potential to reach people in fresh and exciting ways. Examples of such media include text messages on cellular phones, and messages that could appear on social networking sites. The results of a weight loss study that used text messages

were published while this article was undergoing the peer-review process. The findings of that article showed that a group of participants who received personalized text messages several times per day, in addition to printed materials and phone calls from a counselor, lost significantly more weight than a group that received only printed materials (Patrick et al., 2009). Further research comparing reach and effectiveness of various types of communication technology is recommended.

This review shows that the use of periodic prompts can be effective in behavior change interventions. Effectiveness is enhanced if prompts are frequent and personal contact with a counselor is included. These findings can be used to improve interventions that use periodic prompts, and will, we hope, result in increased effectiveness of interventions, positive behavior change, and improved health.

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Part Two - Cultural Significance of Monday and Potential Use in Health Promotion Programs

Abstract

This review explores the cultural attributes of Monday, to gain insights into shaping effective weekly periodic prompts for health promotion interventions. The review focuses on Monday specifically because several health promotion campaigns currently use Mondays to remind people to take action. No identified studies in the peer-reviewed literature from any discipline evaluate the suitability of a particular day of the week for health promotion messages. Searching was performed using multiple databases and websites to identify sources of information relevant to the cultural significance of Monday. The results are presented using the following themes: Monday as a common American experience, Monday health outcomes, negative attitudes toward Monday and framing Monday as a positive new start. The results show that negative attitudes toward Monday, as the first day back at work after the weekend, persist, but that many websites, books, campaigns, and blogs offer a positive perspective on Monday. This literature review suggests several ways to use Mondays as a recurring time element in health promotion programs, and specifically, to frame Mondays as an important day for addressing one's health. Further observational and experimental research is needed to investigate the effectiveness of Monday frames. Research on cultural significance of other weekdays could also be beneficial.

Introduction

Timing is an important and relatively underexamined aspect of health promotion programs. To what extent does it matter when and how often health messages are communicated? What can the literature and social data suggest about optimal scheduling for messaging? Part one of this report, which was published in a peer-reviewed journal, reviewed the literature on the effectiveness of periodic prompts (i.e., weekly messaging) in health promotion interventions (Fry & Neff, 2009), and the findings suggest the particular effectiveness of periodic prompts of higher frequency (i.e., weekly as opposed to every three weeks) (Lombard, Lombard & Winnett, 1995) and those delivered by a counselor (not necessarily in-person) (Tate, Jackvony & Wing, 2006; Tate, Jackvony & Wing, 2003; Williamson et al., 2006). In addition, recently published findings from a large randomized worksite trial that used weekly emails as a main intervention tool reported positive results regarding dietary and physical activity behavior that persisted four months after the intervention ended (Sternfeld et al., 2009). No identified studies in the peer-reviewed literature from any discipline evaluated the suitability of a particular day of the week for health promotion messages.

This review begins to explore that question by examining the cultural significance of a day of the week, Monday, in order to learn how those attributes may influence the day's value for delivering health promotion messages. These messages could encourage participants to take action on that day or during the week. The paper also considers how the attributes can be incorporated into the content of health education programs to potentially enhance their effectiveness and increase participant attention.

Background

Culture has been defined as “the integrated system of socially acquired values, beliefs, and rules of conduct which delimit the range of accepted behaviors in any given society” (“Culture,” 2007). Therefore, the cultural significance of Monday refers to the importance of the weekly rhythm, and specifically Monday, in cultural values, beliefs, and rules of conduct in Western society. The pervasiveness of this weekly rhythm is often taken for granted, but it affects many aspects of society. A wide variety of experience regarding Monday exists, even within Western societies; this paper explores general themes and cultural references to Monday. Life in Western cultures is planned and lived by the week. The day of the week is more informative than the day of the month regarding what planned activities the day will hold. Upon waking, a person usually must know what day of the week it is in order to know what to do and where to go. Work and school generally occur during the week (Monday through Friday), and religious attendance (for many), leisure activities, and housework are more commonly concentrated on the weekend (Saturday and Sunday).

Certain days of the week have positive or negative attitudes commonly associated with them. For example, Fridays are workdays but are often described as more enjoyable by most employees and students because the free time associated with the weekend is close. Other days of the week do not seem to have such consistent, pervasive attitudes associated with them. For example, Tuesday, Wednesday, and Thursday might be viewed similarly to each other because most people were at work or school the day before, and will be again the following day.

Methods

To identify items relevant to the cultural significance of Monday (both directly and in contrast to other days of the week), electronic searches were performed between July and September of 2008. Databases and websites used include PubMed, PsycINFO, Google Scholar, Academic Search Premier, Sociological Abstracts, Anthropology Plus, U.S. Department of Labor (www.dol.gov), the Johns Hopkins University Library Catalog, LexisNexis Academic, Proquest, CINAHL, and Web of Science. Searches utilized the following main terms: Monday, weekday, day of the week, week, seven day, workweek, weekend, Sunday, Tuesday, Wednesday, Thursday, Friday, and Saturday. Additional terms were used in combination with some of the above terms: morning, history, marketing, happy, cultural significance, blues, inspiration, motivation, nontraditional [workweek, week], international [workweek], and messages. Relevancy was determined subjectively by the first author based on assessment of relation to Monday or weekly information/theme. For example, if a journal article described patients coming in for blood draws each Monday during a clinical trial, but the day they came in was not relevant to the study, that was not considered relevant. On the other hand, if researchers reported increased rates of a negative health outcome on a certain day of the week (even if the reason was not known), it was included.

To complement findings from the scientific literature, we also sought to identify cultural references to “Monday” in books, songs, music albums, movies, television shows, and video games. To identify these, searches were performed using Google (www.google.com), Barnes and Noble

(www.barnesandnoble.com), Amazon (www.amazon.com), iTunes, and the Internet Movie Database (www.imdb.com). Searches utilized the keyword Monday, both alone and paired with each of the following terms: weekday, blue/blues, inspiration, motivation. These terms were identified based on initial review of the findings from searching “Monday” alone. The names of the other days of the week were also searched individually in these sites. All songs, albums, movies, television shows, and video games with Monday in the title were included. Books with Monday in the title were reviewed for relevance to the topic to determine inclusion.

The above searches provide information regarding how Monday is used in a variety of cultural materials. However, due to the number of items, frequent repetition, and non-relevant items, it is difficult to gain insight from them regarding the relative frequency of negative, positive, and neutral items. As one general, though limited, approach to that question, we performed searches using the Google Blog Search Engine (blogsearch.google.com) to compare numbers of results with positive and negative words or phrases paired with “Monday.” Based on words appearing frequently in earlier searches in cultural materials, a set of word pairs with “Monday” was identified, balanced between positive and negative frames. Quotes were placed around the word pairs in order to avoid identifying blog entries containing the paired word that were simply written on a Monday. The 10 combinations of positive and negative words with the most results were included in the final analysis and are shown in Table 2. Final blog searches were performed on September 30, 2008.

Results

After sources of information relevant to the cultural significance of Monday were reviewed, the following themes were developed inductively by the authors to organize and present the findings: Monday as a common American experience, Monday health outcomes, negative attitudes toward Monday, and framing Monday as a positive new start. The findings relevant to each theme are described below. The content of the items may suggest ideas for intervention development.

Monday as a Common American Experience

According to a 2004 study by the U.S. Bureau of Labor Statistics, about 66 percent of U.S. workers over age 16 usually work only on weekdays (McMenamin, 2007). Many of these workers likely begin their workweeks on Monday. A portion of an additional 8 percent of workers reporting Saturday work (McMenamin, 2007) is likely to also begin their workweeks on Monday. In addition, virtually all primary and secondary educational institutions in the U.S. begin their weeks on Monday. While not all work and school weeks start on Mondays, the concept of “Monday” as the beginning of the week likely affects most people due to formative experiences, cultural norms, work/school schedules of family and friends, and the structure of government and business office hours.

Monday Health Outcomes

One unique characteristic of Monday is the increased occurrence of negative health events on this day of the week in countries that begin their workweeks on Monday (similar studies in countries that begin work on other days were not found). Several studies have reported an increase in negative health events related to the heart on Mondays including myocardial infarction (Thompson, Pohl & Sutton, 1992; Spielberg, Falkenhahn, Willich, Wegscheider & Völler, 1996; Gneccchi-Ruscione et al., 1994; Bi-

lora et al., 1993; Willich et al., 1994; Witte, Grobbee, Bots & Hoes, 2005), cardiac arrest (Evans et al., 2000; Witte, Grobbee, Bots & Hoes, 2005), cardiac arrhythmias (Doskocch & Potera, 1997), rapid ventricular arrhythmias (Peters, McQuillan, Resnick & Gold, 1996), and a spike in blood pressure (Murakami et al., 2004). Interestingly, two articles reported that the Monday increase in heart attacks was more pronounced in the working population (Bilora et al., 1993; Willich et al., 1994), and another reported that the increase was similar for working and retired subjects (Spielberg et al., 1996).

A few theories have been proposed to explain the increase in negative health events related to the heart on Mondays, but the cause is not well understood. Theories include stress due to the beginning of the workweek (Martyn, 2000), transitioning from unscheduled activities on the weekend to scheduled activities during the week (Spielberg et al., 1996; Gnecci-Ruscione et al., 1994), excessive drinking during the weekend (Evans et al., 2000), and changing sleep patterns (Taylor, Wright & Lack, 2008; Yang & Spielman, 2001).

Studies using data from the United States, Canada, and Australia report higher occupational injury rates on Monday among men (Brogmus, 2007) as well as among men and women (Campolieti & Hyatt, 2006; Wigglesworth, 2006). The timing of occupational injury reporting has additional layers of complication, compared to health events related to the heart, because reporting can be delayed and because reporting that an injury occurred on the job rather than on personal time can carry significant incentives (including the possibility of receiving workers' compensation or paid time off) and disincentives (risk of job penalties or loss, risk of investigation into personal behavior or immigration status, and so on) (Loeser, Henderlite & Conrad, 1995; Strunin & Boden, 2004). A study that investigated this issue compared U.S. and Canadian occupational injury data to see if universal health insurance coverage in Canada affected occupational injury reporting. The authors found similar weekly patterns in the U.S. and Canada and concluded that U.S. workers were not reporting injuries occurring during leisure time to obtain medical coverage (Campolieti & Hyatt, 2006). The authors could not rule out the possibil-

ity that workers report non-work injuries as occupational injuries to obtain paid leave for recovery time. Researchers theorize that the increased occupational injury rate on Mondays is due to readjusting to the workweek after being away over the weekend (Brogmus, 2007; Campolieti & Hyatt, 2006; Wigglesworth, 2006), but the phenomenon of increased occupational injuries on Mondays remains poorly understood.

Other negative health events that occur in larger numbers on Mondays include suicide (McCleary, Chew, Hellsten & Flynn-Bransford, 1991; Massing & Angermeyer, 1985), stroke (Manfredini et al., 2001), and referrals to secondary care of certain conditions hypothesized to be related to heavy drinking over the weekend (Vehviläinen, Kumpusalo & Takala, 1999; Urdal et al., 1998). Diet and exercise researchers found that blood tests were indicative of significantly worse health if a participant's blood was drawn on a Monday (Urdal et al., 1998). They suggested that unhealthy habits which people participate in on weekends may cause less healthy results on Mondays, and recommended that researchers take this weekly variation into account when collecting biological samples from study participants (Urdal et al., 1998). Findings like these are important because they increase our understanding of the spikes in poor health events on Mondays.

Negative Attitudes Toward Monday

This section describes mood research and evidence about sleep patterns, as well as findings from searches of music, movies, and Internet blogs.

Psychology researchers have examined people's experience of moods on Mondays. Studies have found that participants expected their mood to be poor on Mondays (Areni & Burger, 2008; Totterdell, Parkinson, Briner & Reynolds, 1997), and reported their mood from past Mondays as having been poor (Stone, Hedges, Neale & Satin, 1985). Using momentary mood reports, which require participants to report their present mood, these same studies found no evidence of poorer mood on Mondays (Areni & Burger, 2008; Totterdell et al., 1997; Stone

et al., 1985). These findings suggest that the dread associated with Monday may not be based on actual experience.

There is also evidence that refutes the idea that dislike for Mondays is based solely on social norms and beliefs. A study of sleep patterns and circadian rhythm found that participants who were allowed to sleep late on Saturday and Sunday mornings during an experiment did so and subsequently experienced delayed sleep onset on Sunday evening and greater daytime fatigue and sleepiness on Monday and Tuesday (Taylor et al., 2008). The 2008 Sleep in America Poll by the National Sleep Foundation (2008) revealed that respondents reported going to bed an average of 30 minutes later on non-work days as compared to work days and waking up an average of an hour and a half later on non-work days as compared to work days. Clearly, it is common in the U.S. to stay up late and sleep late on the weekends, a pattern that can result in a delayed circadian rhythm. The resulting sleep deficit on Sunday night may partly explain why many experience increased fatigue on Mondays.

Monday is in the title of numerous music albums, songs, movies, and television shows. Examples of these are shown in Table 1. In many cases, the word Monday is paired with words or phrases that give the reference to Monday a negative feel. Negative words and phrases in titles include apocalypse, stormy, bad, rainy, “don’t like,” blue, manic, dead, dump, mayhem, and black. There are also titles that include positive words such as miracle, and others contain neutral words alongside the word Monday. A negative attitude toward Sunday, which is related to viewing Monday negatively, is apparent in American cultural references such as John Updike’s novel *Couples* when he describes the “chronic sadness of late Sunday afternoon” owing to the approaching workweek (Updike, 1996). A few websites were found that have directions on how to beat the “Monday blues” (Sadhana, 2005; “20 Ways”, 2008; “How to Beat,” n.d.).

Table 1. Examples of Pop-culture Titles Containing Monday

Albums	“Stormy Monday (a.k.a. I’d Rather Drink Muddy Water)” Lou Rawls (1962) “Monday Morning Apocalypse” Evergrey (2006)
Songs	“Stormy Monday Blues” Earl Hines and Billy Eckstine (1942) “Call It Stormy Monday (But Tuesday Is Just As Bad)” T-Bone Walker (1947) “(They Call It) Stormy Monday” Lou Rawls (1962) “Monday, Monday” The Mommas and the Papas (1966) “Rainy Days and Mondays” The Carpenters (1971) “Stormy Monday” The Allman Brothers (1971) “Come Monday” Jimmy Buffett (1974) “Monday Morning” Fleetwood Mac (1975) “I Don’t Like Mondays” Boomtown Rats (1979) “Blue Monday” New Order (1983) remade by Orgy (1998) “New Moon on Monday” Duran Duran (1984) “Manic Monday” The Bangles (1986) “Monday Morning” Pulp (1995) “I Don’t Have To Be Me (‘Til Monday)” Steve Azar (2002) “Rainy Monday” Shiny Toy Guns (2005) “Permanent Monday” Jordin Sparks (2007)
Movies	Rabbit Every Monday (1951; Short Cartoon, USA) First Monday in October (1981; USA) Stormy Monday (1988; USA) Monday Morning (1990; USA) Miss Monday (1998; USA) Dead by Monday (2001; Germany) Monday Night at the Rock ‘N Bowl (2002; USA) Monday Night Gig (2005; USA) The Girl From Monday (2005; USA) Man vs. Monday (2006; USA) The Third Monday in October (2006; USA)
Television	NFL Monday Night Football (1970-Present; USA) The ABC Monday Night Comedy Special (1977; USA) Saturday, Sunday, Monday (1978; TV Movie, UK) Come Midnight Monday (1982; Australia) Monday Night Countdown (1993-Present; USA) WWF Monday Night RAW (1993-Present; USA) Monday After the Miracle (1998; TV Movie, USA) The Monday Dump (2001; TV Movie, Australia) The Monday Night Miracle (2007; TV Movie, USA) First Monday (2002; USA) Monday Night Mayhem (2002; TV Movie, USA) Monday Monday (2009; UK)
Videogames	ABC Monday Night Football (1989, 1990, 1991; USA) The Getaway: Black Monday (2004; UK)

In an attempt to get a rough quantification of types of references to Monday by a population that is free to post any content (i.e., does not have to be approved by a newspaper editor or book publisher), blog searches of Monday references were performed. The 10 positive and 10 negative pairings producing the most results were included in a final comparison, which is shown in Table 2. The 10 negative pairings produced 26 percent more hits than the 10 positive pairings (203,514 vs. 161,455).

Table 2. Monday Blog Search Results

	Negative Blog Terms	Number of Results
1.	“blue Monday”	63,794
2.	“Monday blues”	60,117
3.	“hate Mondays”	40,832
4.	“Monday already?”	13,628
5.	“Mondays suck”	9,155
6.	“bad Monday”	8,865
7.	“gloomy Monday”	2,215
8.	“dreading Monday”	2,100
9.	“sad Monday”	1,408
10.	“no more Monday”	1,400
	Total:	203,514

	Positive Blog Terms	Number of Results
1.	“happy Monday”	88,596
2.	“good Monday”	29,989
3.	“great Monday”	21,622
4.	“love Monday”	5,746
5.	“wonderful Monday”	5,584
6.	“lovely Monday”	3,454
7.	“Monday inspiration”	2,071
8.	“super Monday”	1,781
9.	“perfect Monday”	1,582
10.	“bright Monday”	1,030
	Total:	161,455

Ratio of negative results to positive results:	1.26
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Framing Monday as a Positive New Start

Perhaps in response to the negativity associated with Monday, numerous books, blogs, and websites offer explicitly positive messages aiming to inspire others regarding the first day of the workweek. Despite extensive searching, few items with positive messages regarding Monday were found in academic literature or cultural references such as song and album titles. Multiple books aiming to help people with their careers use messages about Monday in their titles, thus capitalizing on a strong association between work and Monday in Western culture. Examples are listed in Table 3. The books provide advice, tips, stories, and lessons. They are primarily written for people wanting to enjoy their work, move up in their careers, become better leaders, and/or inspire co-workers. While two of the book titles frame Monday as a negative experience needing to be overcome, seven books frame the first day back to work as a positive experience. The titles of these books focus on Mondays, but the content is aimed at improving the entire week. There is an underlying message in most of these books that beginning the workweek with a fresh perspective and enthusiasm toward work will result in a better Monday and week.

Bruce Rector began composing inspiring messages for Monday mornings in 1997 to motivate entrepreneurs he was working with (Rector, 2005). His messages include personal stories and focus on a broad array of topics, such as the importance of extending simple courtesies and “stepping out of the box.” They became popular, and he wrote a book titled *Monday Morning Messages: Teaching, Inspiring, and Motivating to Lead*, which has 52 messages to be read for a year. He also created a website (www.mondaymorningmessages.com), which allows people to sign up to receive his messages each Monday by e-mail. In the introduction to his book he writes, “The events on Monday morning and how we react to them can either destroy our energy, enthusiasm,

and productivity for the entire week or provide an uplifting foundation for great accomplishments (page xi)” (Rector, 2005). This statement is based on feedback he received from readers, and it illustrates the significance of framing Monday as the beginning of a new week with possibilities and opportunities.

because it is the day that ends the weekend and that their goal is to “change the ‘image’ of Mondays by making them mean something amazing, something incredible, something unbelievable” (Emerzian & Bozza, 2008). This campaign aims to inspire people who want to make the world a better place, providing

Table 3. Books Aimed at Career Development/Work With Monday in the Title

	Title	Author
Monday Framed as a Negative Experience Needing To be Overcome:	Choosing Rest: Cultivating a Sunday Heart in a Monday World (2002)	Sally Breedlove
	No More Mondays: Fire Yourself and Other Revolutionary Ways to Discover Your True Calling at Work (2008)	Dan Miller
Monday Framed as a Positive Experience:	Happy Mondays: Putting the Pleasure Back Into Work (2002)	Richard Reeves
	Looking Forward to Monday Morning: Ideas for Recognition and Appreciation Activities and Fun Things to do at Work for Educators (2004)	Diane Hodges
	Looking Forward to More Monday Mornings: How to Drive Your Colleagues Happy! (2007)	Diane Hodges
	Loving Monday: Succeeding in Business Without Selling Your Soul (1998)	John D. Beckett
	Monday Morning Choices: 12 Powerful Ways to Go From Everyday to Extraordinary (2008)	David Cottrell
	Monday Morning Mentoring: Ten Lessons to Guide You Up The Ladder (2006)	David Cottrell
	Monday Morning Messages: Teaching, Inspiring and Motivating to Lead (2005)	Bruce Rector

Another book aimed at reframing Monday as a positive force is *Every Monday Matters: 52 Ways to Make a Difference*, written by Matthew Emerzian and Kelly Bozza (2008). The authors describe the book as an “involvement guide” for people who want to make a difference in their lives and the lives of others. The book consists of 52 activities to be completed each Monday over the course of one year, and it is aimed at reducing disengagement. Suggestions vary from simple, individually focused activities, such as reading a book, turning off your television, avoiding nicotine, and eating healthfully, to tasks that involve others such as thanking a teacher, donating clothes, mentoring a child, and helping the hungry. Instructions for each activity are accompanied by data illustrating the need for the action and the estimated impact if people complete the task. The authors address the “Why Monday?” question by saying Monday is the least favorite day of the week

ideas, instructions, and a time element to get people started and keep them on track.

Finally, a set of related projects—called the Monday campaigns—frame Monday as a fresh start and a cue to action regarding healthy behaviors. These include Healthy Monday and Meatless Monday, which are national campaigns that encourage participants to use the start of each week to commit or recommit to health-promoting behaviors. Meatless Monday promotes reducing consumption of saturated fat 15 percent by not eating meat one day a week, and it works in association with the Johns Hopkins Bloomberg School of Public Health. Healthy Monday is a public health campaign run by Columbia University’s Mailman School of Public Health to encourage Americans to adopt healthy habits each week.

Partners of the campaign, such as schools and hospitals, develop their own programs using Monday as the time prompt. The result is many health promotion programs with Monday as the focus reaching populations in various ways. Programs promote weight loss, healthy eating, increased exercise, smoking cessation, and stress reduction. Communication media used by partners include email, newsletters, television segments, and in-person group sessions. For example, weekly emails sent from the Meatless Monday campaign to subscribers include a tip for the week, a few meatless recipes, summaries of the latest health news, and links to blogs with health-related content. The overall goal of the campaigns is to decrease premature morbidity and mortality associated with the leading causes of preventable disease in the U.S., which are poor diet and inactivity, smoking, and alcohol misuse (Mokdad, Marks, Stroup & Gerberding, 2004). In recent years, Meatless Monday has been endorsed by a range of people, from government officials in San Francisco to celebrities including Paul McCartney, as an action that citizens can take to reduce carbon emissions (LeTrent, 2010).

The Monday campaigns contracted with FGI Research, a consumer research company, in 2008 and 2009 to conduct nationwide surveys. For each survey, 1,500 consumer panelists (at least 25 years of age) responded to 10 questions relevant to the Meatless Monday and Healthy Monday campaigns. Results of the 2008 survey revealed that over a third of respondents (36.8 percent) view Monday as a “fresh start” and one-fifth (20.7 percent) view Monday as a day to get organized. A little over 10 percent (12.4 percent) said they dread Mondays and less than a third (30.1 percent) responded that they do not view Monday differently than any other day of the week.

Participants were also asked in 2008 which day they prefer to begin specific healthy habits. Almost half (47.3 percent) said they were more likely to begin a diet on a Monday, which was almost 13 times more people than those who chose Sunday (3.7 percent), the day with the second highest number of votes. More than 40 percent (43.1 percent) said they had no preference or that the question was not applicable. To begin an exercise regimen, again

almost half (46.6 percent) reported they are more likely to choose Monday, which was almost seven times greater than the day with the second highest number of selections (6.7 percent chose Saturday). Over a third (36.4 percent) had no preference or chose “not applicable.” Monday was also selected most among respondents who had a preference for a day they would quit smoking (16.1 percent), but more than three-quarters (76.4 percent) had no preference or said the question was not applicable. The day of the week chosen most often after Monday was Sunday, and only 2.3 percent of panelists chose this day.

In 2009, consumers were asked about a different set of habits related to health. Panelists preferred Monday for calling to schedule a doctor’s appointment (28.3 percent) and refilling a prescription (10.2 percent). More than half reported no preference or that the question was not applicable for scheduling a doctor’s appointment (51.9 percent) and an even higher percentage did not choose a certain day for refilling a prescription (62.8 percent). For grocery shopping, Saturday and Sunday were chosen most often, but the percentages were closer together than those for the other health habits. The percentages ranged from 7.0 percent for Tuesday to 16.8 percent for Saturday (7.9 percent selected Monday, and 31.6 percent did not choose a certain day). Half of the panelists had no preference for when they plan their meals for the week (50.1 percent), and about one-fifth preferred Sunday (21.0 percent). Monday was chosen most often after Sunday (9.4 percent).

The results of these surveys show that a majority of respondents have a positive attitude toward Monday, and that Monday is a natural choice for encouraging healthy behaviors because many people already prefer this day for performing healthy habits

Discussion

The relevant materials identified show that Monday is a unique day of the week with certain attitudes and health outcomes associated with it. This distinction probably developed because of the common experience of beginning work and school on Monday. The negative health outcomes that are more prevalent on Mondays support the idea that the transition from the weekend to the week affects health. The negative attitude associated with Monday is not surprising since many people do not look forward to the end of the weekend, but consumer research shows that there is a pervasive attitude toward Monday as a “fresh start” and a day to get organized. Individuals and organizations that frame Monday as a “fresh start” focus on having a positive attitude toward one’s career, becoming engaged in the community, and practicing healthy behaviors.

Raising public awareness of Monday health statistics may cause people to view the day more negatively, but it could also serve as a cue to action for those thinking about adopting and/or maintaining healthy behaviors. In much the same way that many people avoid driving on evenings when others on the road are most likely to be impaired (i.e., New Year’s Eve), people may start to think of Monday as a day when they are exceptionally aware of their health, and thus renew their commitment to take positive action.

References to Monday are plentiful in Western culture, and our searches provide suggestive evidence that negative references may be more plentiful than positive ones in music, movies, and blogs. The fact that negatively valenced Monday search terms produced only 26] percent more hits than positive pairings is somewhat surprising considering the level of negativity associated with Monday in pop culture. The two identified studies about mood experience, while somewhat inconsistent, give insight into the experience of Monday: in one study, participants did not experience actual increases in negative mood on Monday; the other provides cultural and biological reasons for poor mood being widely experienced on Mondays.

Negative attitudes toward the first day back at work after the weekend persist, especially in pop culture, but many websites, books, and blogs offer a positive perspective on Monday. Successfully framing Monday as an important day for thinking about health could potentially strengthen health promotion programs. If health behaviors were considered each Monday as the result of a health promotion program and/or activity reminding people to do so, ill effects of unhealthy lifestyles might be reduced. Of course, the likelihood of individual behavior change must be understood within the context of the array of factors in the social and physical environment that promote and challenge efforts to improve lifestyles, and further, behavior change does not prevent all illness. Yet, improved health promotion strategies can help motivate individuals to put forth their best efforts to make positive change.

Some potential strategies for integrating a Monday component into health promotion programs include:

- Highlight the increased occurrence of heart attacks on Mondays and encourage people to attend the gym/go to the doctor for a screening/eat healthfully/take a walk.
- Share information on how excessive drinking, sleep deficits, and unhealthy eating lower your health profile on Mondays and encouraging people to get “back on track” each Monday.
- Play off of negative references to Monday in pop culture to help get people’s attention before encouraging them to participate in a program.
- Encourage people to view each Monday as a fresh start for a certain behavior and then provide a cue to action each week to refresh their effort.
- Partner with existing campaigns framing Monday in a positive way and incorporate their messages into your program.

Strengths and Limitations

A limitation of this paper is the possibility that the search strategy resulted in relevant literature not being identified. Also, searches for cultural materials did not allow quantification of frequency or significance of these messages within the culture. The method of trying to quantify relative frequency of positive versus negative framing via blog postings is recognized as crude at best, with limitations including duplicate results, cross-postings, the meaning of the post not being represented by the search terms (i.e., sarcasm), and the fact that blogging as an activity is not evenly distributed across the population, and may be disproportionately used both by those seeking to inspire and those who wish to complain. Nonetheless, the number of results illustrates a widespread significance of Monday among those communicating via blogs and a significant, but not huge, difference between blogs with negative and positive words paired with Monday. The latter limitation can also be stated more generally: There are many different subcultures operating at different levels; these are not all equally represented through any of the tools that can be searched online.

To our knowledge, this paper is the first to examine the cultural significance of Monday and the current and potential use of Monday in health promotion interventions. While the above limitations exist, the paper does gather information from a wide variety of cultural sources, and is based on information gathered using consistent and clear search methodology. It is hoped that the information will prove useful to health promotion professionals, as well as stimulate further investigation.

Conclusion

The use of Monday in health promotion programs has great potential because of the negative health statistics unique to that day of the week and ongoing efforts to frame the day as a positive new start, despite representation of widespread negative attitudes in pop culture. The negative health outcomes that occur disproportionately on Mondays provide an unfortunate link between health and the first day back at work or school, but the return to a regular schedule after the weekend break provides an opportunity for health promotion professionals to reach their audiences. Recognition of the cultural significance of Monday may provide insights that can contribute to the development of effective and resonant health promotion messages and activities. Primary research assessing the value of incorporating Monday into health promotion programs is a logical next step.

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