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## Preventive Medicine

journal homepage: [www.elsevier.com/locate/ypmed](http://www.elsevier.com/locate/ypmed)

## Letter to the Editor

## Planning prompts as a means of increasing preventive screening rates

## Keywords:

Reminder systems  
Communication  
Economics  
Behavioral  
Primary prevention  
Colonoscopy  
Memory

In the U.S., 18,800 lives could be saved annually if those advised to obtain colorectal screenings based on national guidelines complied (Zauber et al., 2012). Subtle suggestions embedded in a decision-making environment can change people's choices (Thaler and Sunstein, 2008). Past research has shown that prompting people to form plans about where and when they will complete an intended behavior increases engagement in activities ranging from voting to vaccination (Gollwitzer and Sheeran, 2006; Milkman et al., 2011; Nickerson and Rogers, 2010). When plans are formed, they link intended behaviors with a concrete future moment and course of action, creating cues that reduce forgetfulness and procrastination. We studied whether planning prompts increase colonoscopy rates.

In summer 2010, 11,918 employees from four U.S. companies were selected for the study because they were due for a colonoscopy according to the Centers for Disease Control criteria (USPSTF, 2008). Evive Health, a healthcare communications provider, randomly assigned these employees to a control or planning group and sent each a mailing explaining that national guidelines recommended they receive a colonoscopy. Mailings provided contact information for a proctologist, listed the percentage of cost covered by insurance, and emphasized that sticky notes help people remember to accomplish important tasks (like getting a colonoscopy). A blank yellow sticky note was attached to the top of the control group mailing. For the planning group, the mailing was identical, except the sticky note contained a six-word planning prompt:

"Don't forget!  
Colonoscopy appointment  
with  
on"

We analyzed colonoscopy medical claims of study participants from the time of the mailings through February 2011. The 7.2% colonoscopy rate of the planning group was significantly higher than the 6.2% rate of the control group (Table 1), a relative increase of 15%.

If planning prompts reduce forgetfulness as hypothesized (Gollwitzer and Sheeran, 2006), they should help forgetful sub-populations most. Fifty-four MTurk respondents were asked which characteristics they believe are associated with forgetfulness. All of the identified characteristics (male, older, parent, lower insurance coverage, ignoring previous reminders) are associated with larger planning prompt treatment effects.

Table 1  
Sample characteristics of U.S. employees at baseline and impact of summer 2010 Evive reminder mailing.

	Full sample (n = 11,918)	Control group (n = 5,898)	Planning group (n = 6,020)
Baseline sample characteristics			
Male (%)	50.77	50.32	51.21
Age	57.5 (4.9)	57.5 (4.8)	57.5 (4.9)
Has 1+ children (%)	9.85	9.63	10.07
Caucasian (%)	94.99	94.86	95.12
Black (%)	0.08	0.05	0.10
Hispanic (%)	4.68	4.83	4.53
Asian (%)	0.25	0.25	0.25
First reminder (%)	76.80	77.08	76.53
Percent of colonoscopy's cost covered by insurance	87.2 (8.9)	87.3 (9.0)	87.1 (8.9)
Employer 1 – Jun. mailing (%)	15.47	16.1% <sup>†</sup>	14.87
Employer 2 – Jul. mailing (%)	1.33	1.44	1.21
Employer 3 – Aug. mailing (%)	59.98	59.51	60.43
Employer 4 – Aug. mailing (%)	23.23	22.96	23.49
Impact of mailing: outcome is post-mailing colonoscopy claims by Feb. 2011			
Full sample colonoscopy rate, unadjusted (%)	6.69	6.21*	7.16
Difference relative to the control condition			
Unadjusted difference (%)	N/A	N/A	0.95*
OLS regression-adjusted difference <sup>a</sup> (%)	N/A	N/A	0.95*

<sup>†</sup>p<0.10; \*p<0.05. Except in the case of regression-adjusted estimates, statistical significance reports rely on two sample t-test (for continuous variables) and two sample proportions test (for dichotomous variables) comparing the control and treatment conditions.

Standard deviations are shown in parentheses.

<sup>a</sup> Ordinary least squares (OLS) regression controls include sex, age, parental status, race/ethnicity, whether a previous reminder was ignored, colonoscopy percent coverage, and employer fixed effects.

A forgetfulness proxy, constructed by summing indicators for these variables (calculated for age and coverage by dividing by their respective ranges), has a significant positive interaction with the treatment effect on colonoscopy receipt (p<0.05).

Our results show that planning prompts, at no additional cost and without restricting choice, can increase follow-through on unpleasant and temporally distant health behaviors like colonoscopies.

## Conflict of interest

The authors declare that there are no conflicts of interests.

## Acknowledgments

We thank Prashant Srivastava, Jennifer Lindner, and our other contacts at Evive Health for providing the study data. Michael Puempel provided excellent research assistance. We acknowledge individual and collective financial support from the National Institute

on Aging (grants P01AG005842 and P30AG034532). See the authors' websites for lists of their outside activities.

## References

- Gollwitzer, P.M., Sheeran, P., 2006. Implementation intentions and goal achievement: a meta-analysis of effects and processes. *Adv. Exp. Soc. Psychol.* 38, 69–119.
- Milkman, K.L., Beshears, J., Choi, J.J., Laibson, D., Madrian, B.C., 2011. Using implementation intentions prompts to enhance influenza vaccination rates. *PNAS* 108, 10415–10420.
- Nickerson, D.W., Rogers, T., 2010. Do you have a voting plan? Implementation intentions, voter turnout, and organic plan making. *Psychol. Sci.* 21, 194–199.
- Thaler, R.H., Sunstein, C.R., 2008. *Nudge: Improving Decision About Health, Wealth, and Happiness*. Connecticut: Yale University Press.
- U.S. Preventive Services Task Force, 2008. Screening for colorectal cancer: U.S. preventive services task force recommendation statement. External Web Site Icon AHRQ Publication 08-05124-EF-3, October 2008. Agency for Healthcare Research and Quality, Rockville, MD.
- Zauber, A.G., Winawer, S.J., O'Brien, M.J., et al., 2012. Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. *N. Engl. J. Med.* 366, 687–696.

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