Leveraging Goals to Incentivize Healthful Behaviors Across Adulthood: Online Supplement

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Supplemental Results

To account for outliers, values exceeding three standard deviations of the mean were Winsorized to three standard deviations of the mean. Correlations among variables are presented in Table 2 in the main text. Coding for orthogonal contrasts is presented in Table S1.

Quadratic effects of age on step count change. In addition to conducting linear regression models (presented in the main text), we tested for quadratic effects of age (i.e., age^2) and *age^2 x incentive* interactions on average daily step change (see Figure S1 for plot of step count change by age and condition using a LOESS smoothing curve). The main effect of age^2 on step change was trending, but did not reach significance, b = -1.77, SE = 0.94, t = -1.89, p = .060. No *age^2 x incentive* interactions reached significance, |bs| < .27, ps > .179.

Step change goals. Regression results are presented in Table S4. Step change goals did not differ between incentivized and control conditions. Participants assigned to earn personal incentives set higher step change goals ($M_{\Delta steps}$ = 2501.64, SD = 2616.08) than those assigned to earn prosocial incentives ($M_{\Delta steps}$ = 1817.21, SD = 2043.25). Unsurprisingly, given lower baseline steps, older adults set lower step change goals than younger adults. No other main effects or interactions were statistically significant.

Habit strength. At baseline, habit strength was uncorrelated with age (see Table 2 in the main text) and did not differ by condition (F(4, 445) = 0.43, p = .78). Change scores for habit strength were calculated as the standardized residuals obtained by regressing post-incentive scores on raw baseline scores. Overall, habit strength increased between baseline and when incentives were no longer offered (M_{Δ} = 0.25, SD = 0.80), t(449) = 6.69, p < .001. We did not observe significant effects of condition (|B|s < .12, ps > .108) or age (B = -.03, p = .981) on change in habit strength. We did observe, however, a significant *loved one* vs. *charity x age*

interaction, B = -.18, SE = .07, p = .013. Follow-up analyses indicated that neither effect of age was significant, but the trend was that older age was associated with an increase in habit strength from baseline in the *charity* condition (B = .17, SE = .11, p = .107), and with a decline in habit strength from baseline in the *loved one* condition (B = -.18, SE = .10, p = .086). We did not observe any other significant interactions (|B|s < .06, ps > .053).

Changes to intrinsic motivation. Finally, we tested whether intrinsic motivation was lower when incentives were no longer offered compared to baseline. Across age and conditions, participants reported a slight increase in intrinsic motivation from baseline (M_{Δ} = .05, SD = .53, t(449) = 2.06, p = .040, 95% CI [.002, .10]) and changed comparably, regardless of incentive type or assignment to target (all |B|s < .06, ps > .156) and age (B = -.04, SE = .05, p = .426). There was an *age* x *personal* vs. *prosocial* interaction on change in intrinsic motivation (B = .11, SE = .04, p = .011, 95% CI [.02, .19]). In follow-up analyses, however, the effect of age on intrinsic motivation change was trending but did not reach significance in either condition (|B|s < .17, ps > .08). No other interactions reached significance (all |B|s < .04, ps > .517). Overall, there was no evidence for declines in intrinsic motivation due to financial incentives.

Perceptions of incentives. Because this question was not asked of control participants, we could not use our planned contrasts. Instead, we dummy-coded condition (reference group = personal condition). Conditions did not differ in how motivating participants found the incentive (|B|s < .09, ps > .53). Older adults reported that the incentive was less motivating than did younger adults (B = -0.32, SE = .10, p = .002). There was an *age* x *charity vs. personal* interaction (B = .34, SE = .14, p = .018). Follow-up analyses suggested that, in the personal condition, older adults reported the incentive was less motivating than did younger adults (B = -.31, SE = .10, p = .003), but there was no effect of age on perceptions of motivation in the charity

condition (B = .02, SE = .10, p = .882). No other interactions reached significance (|B|s < .12, ps > .46).

Target choice within *loved* one condition. Most participants in the *loved one* condition chose to earn money for family members: Thirty-six percent of participants (49% of those aged 55+ and 23% of those under age 55) gave funds to a spouse/partner, thirty percent (37% of 55+ and 23% of < 55) gave to a child, twelve percent (none of those aged 55+, 23% of < 55) gave to parents, and seven percent (none of those aged 55+, 13% of < 55) gave to siblings. Eleven percent of participants (9% of 55+ and 13% of < 55) gave their funds to a friend, and the remaining participants gave the money to another person.[1] In other words, younger participants were most (and equally) likely to choose their spouse/partner, child, or parent. Older participants were most likely to choose their spouse/partner or child.

Use of earnings within *personal* condition. At the close of the study, we asked participants in the *personal* condition how they used their earnings. Of the 79 participants in the *personal* condition who earned a financial incentive, 74 reported on its use. Forty-nine percent of these participants deposited their checks into their personal accounts and had not spent it yet, 15% spent the money on themselves (or planned to do so), 14% split the money in multiple ways or used the money on a shared experience with another person (or planned to do so), 4% used the money to buy something for a loved one or another person, 3% gave the money to charity, 3% declined payment, and the remaining participants had not yet done anything with their earnings.[2]

[1] Because the expected value of several cells was < 5, we were unable to perform chi-square test of independence to determine if there was a relationship between age and target choice.
[2] Because the expected value of several cells was < 5 and the majority of participants of all ages deposited the check into their personal account and had not yet spent it, we were unable to perform chi-square test of independence to determine if there was a relationship between age and use of earnings.

Tables

Table S1.
Coding for orthogonal contrasts

	Weights				
	Personal	Loved One	Charity	Choice	Control
Contrast 1: Incentives vs. Control	1	1	1	1	-4
Contrast 2: Personal Incentives vs. Prosocial Incentives	2	-1	-1	0	0
Contrast 3: Loved One vs. Charity	0	1	-1	0	0
Contrast 4: Choice Incentive vs. Assigned Incentive	-1	-1	-1	3	0

Table S2.

Effects of age, condition, and gender on step count change while incentives were in place

Variable	*B*	*SE B*	*p*	95% CI	
Intercept	-.007	.06	.905	-.12	.10
Gender	-.03	.08	.754	-.18	.13
Age	-.03	.06	.626	-.14	.08
Incentive vs. control	.13	.03	< **.001**	.08	.19
Personal vs. prosocial	.18	.05	< **.001**	.08	.28
Loved one vs. charity	.24	.09	**.007**	.07	.42
Choice vs. assigned	.03	.04	.432	-.04	.10
Gender x age	.05	.08	.499	-.10	.21
Incentive type x age					
Incentives vs. control x age	-.03	.03	.348	-.08	.03
Personal vs. prosocial x age	-.02	.05	.710	-.12	.08
Loved one vs. charity x age	-.38	.08	< **.001**	-.54	-.21
Choice vs. assigned x age	-.06	.04	.117	-.13	.01
Incentive type x gender					
Incentives vs. control x gender	-.004	.04	.911	-.08	.07
Personal vs. prosocial x gender	-.10	.07	.156	-.25	.04
Loved one vs. charity x gender	-.12	.13	.324	-.37	.12
Choice vs. assigned x gender	.04	.05	.457	-.06	.14
Incentive type x age x gender					
Incentives vs. control x age x gender	.02	.04	.698	-.07	.10
Personal vs. prosocial x age x gender	.06	.07	.424	-.09	.20
Loved one vs. charity x age x gender	.44	.12	< **.001**	.20	.68
Choice vs. assigned x age x gender	-.02	.05	.766	-.12	.09
Adjusted R^2	.15				

Note. N = 450. Step count change was calculated as the standardized residuals obtained by regressing incentive week steps on baseline steps, and winsorized to +/- 3 standard deviations to account for outliers. Age was standardized (i.e., M = 0, SD = 1) and gender was dummy-coded (male = 0, female = 1). Conditions were compared using orthogonal contrasts, see Table S1. Bold values indicate $p < .05$.

Table S3.

Effects of age, condition, and gender on step count change after the incentivized period ended

Variable	*B*	*SE B*	*p*	95% CI	
Intercept	.09	.06	.145	-.03	.22
Gender	-.19	.09	**.033**	-.36	-.02
Age	.07	.06	.256	-.05	.19
Incentive vs. control	.01	.03	.638	-.05	.08
Personal vs. prosocial	.15	.06	**.010**	.04	.26
Loved one vs. charity	-.03	.10	.763	-.22	.16
Choice vs. assigned	-.03	.04	.394	-.11	.05
Gender x age	.11	.09	.240	-.07	.28
Incentive type x age					
Incentives vs. control x age	.04	.03	.173	-.02	.11
Personal vs. prosocial x age	.003	.06	.953	-.11	.12
Loved one vs. charity x age	-.23	.10	**.015**	-.41	-.04
Choice vs. assigned x age	-.04	.04	.340	-.12	.04
Incentive type x gender					
Incentives vs. control x gender	.04	.04	.399	-.05	.13
Personal vs. prosocial x gender	-.15	.08	.072	-.31	.01
Loved one vs. charity x gender	-.08	.14	.580	-.35	.20
Choice vs. assigned x gender	.02	.06	.718	-.09	.13
Incentive type x age x gender					
Incentives vs. control x age x gender	-.04	.05	.427	-.13	.06
Personal vs. prosocial x age x gender	.11	.08	.174	-.05	.27
Loved one vs. charity x age x gender	.23	.14	.098	-.04	.50
Choice vs. assigned x age x gender	-.03	.06	.602	-.14	.08
Adjusted R^2	.05				

Note. N = 450. Step count change was calculated as the standardized residuals obtained by regressing post-incentive week steps on baseline steps, and winsorized to +/- 3 standard deviations to account for outliers. Age was standardized (i.e., M = 0, SD = 1) and gender was dummy-coded (male = 0, female = 1). Conditions were compared using orthogonal contrasts, see Table S1. Bold values indicate $p < .05$.

Table S4.

Effects of age and incentive type on step change goal (N = 450)

Variable	*B*	*SE B*	*p*	95% CI	
Intercept	.00	.05	.999	-0.09	0.09
Age	-.13	.05	**.006**	-0.22	-0.04
Incentive vs. control	.01	.02	.543	-0.03	0.06
Personal vs. prosocial	.10	.04	**.026**	0.01	0.18
Loved one vs. charity	.02	.07	.831	-0.13	0.16
Choice vs. assigned	.001	.03	.964	-0.06	0.06
Incentive type x age					
Incentives vs. control x age	-.03	.02	.234	-0.08	0.02
Personal vs. prosocial x age	.009	.04	.827	-0.07	0.09
Loved one vs. charity x age	-.03	.07	.699	-0.17	0.11
Choice vs. assigned x age	-.02	.03	.436	-0.08	0.04
Adjusted R^2	.03				

Note. Age was standardized (i.e., $M = 0$, $SD = 1$) to increase interpretability of condition effects. Step change goal was measured after participants learned of the incentive (or not, in the control condition) but before the incentive week began. To account for outliers, step change goal was winsorized to equal +/- 3 standard deviations of the mean. Bold values indicate $p < .05$.

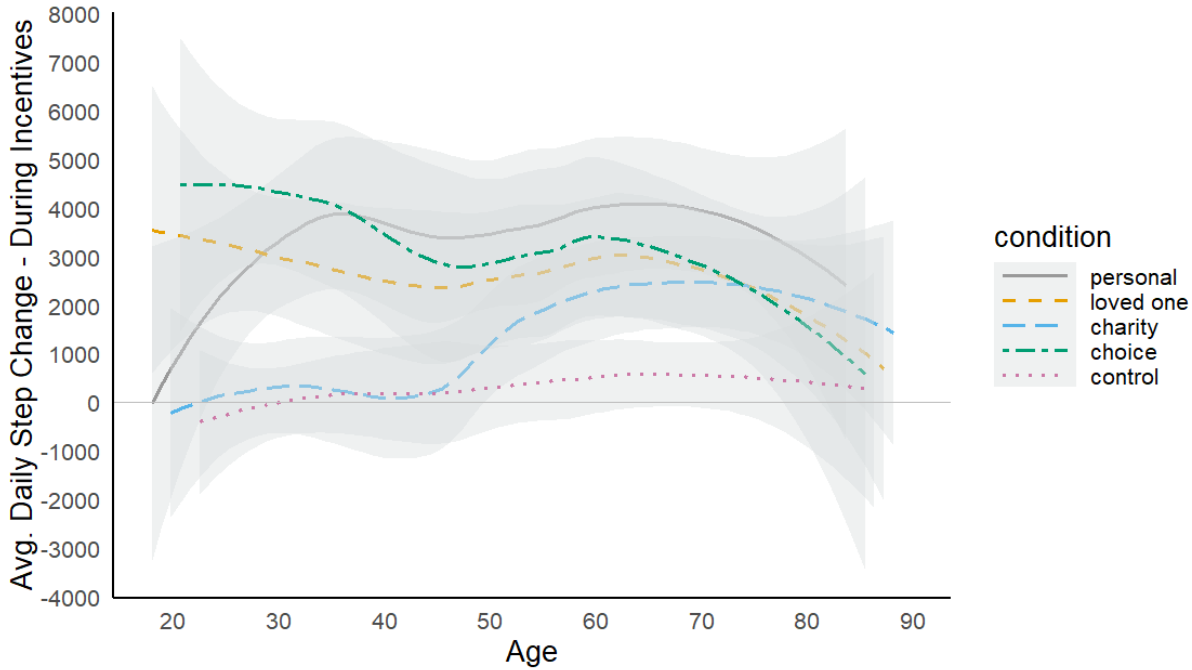

Figure S1. Step count change while incentives were in place (vs. baseline) by incentive type and age using a LOESS smoothing curve (N = 450). For ease of interpretation, change scores were calculated by subtracting average daily step counts during the incentivized week from baseline counts. Shaded regions represent +/- 95% confidence intervals.

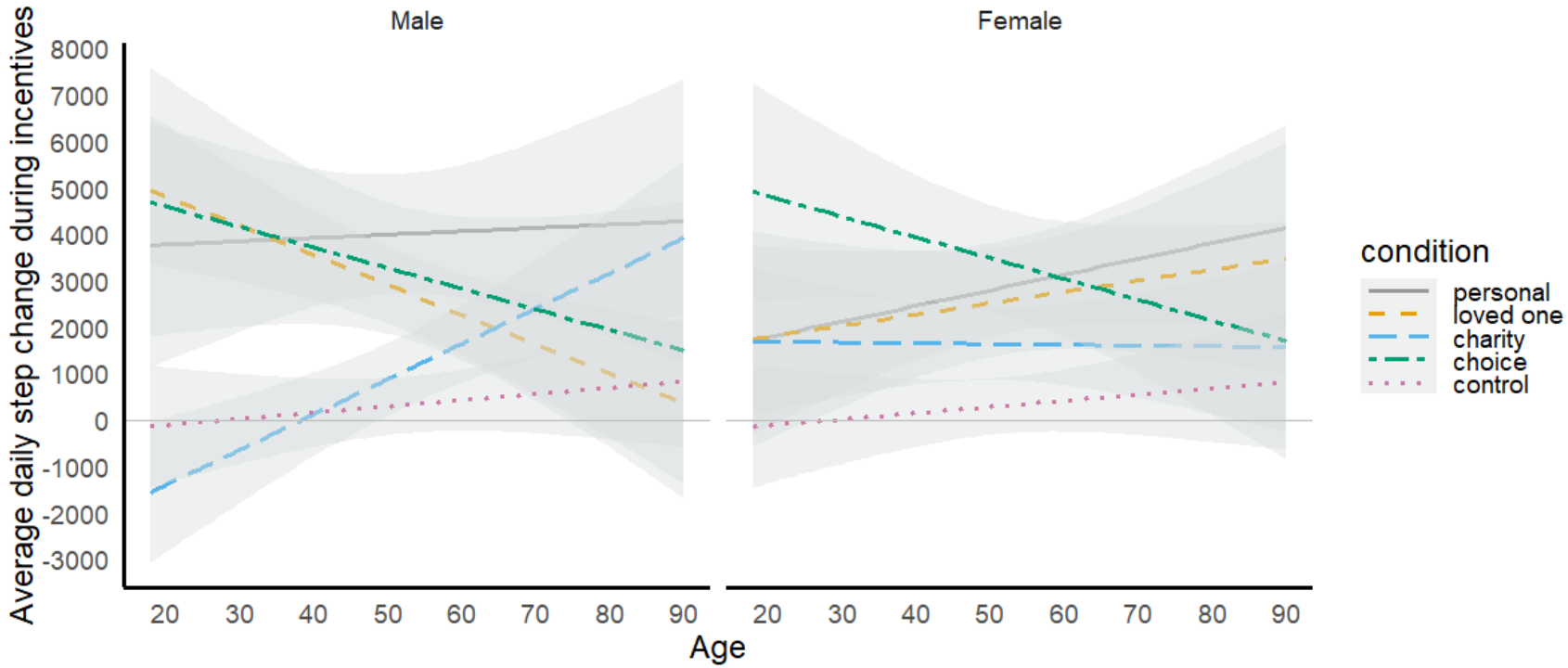

Figure S2. Step count change while incentives were in place (vs. baseline) by incentive type, age, and gender (N = 450). For ease of interpretation, change scores were calculated by subtracting average daily step counts during the incentivized week from baseline counts. Shaded regions represent +/- 95% confidence intervals.