

The Bright Side of Secrecy: The Energizing Effect of Positive Secrets

Supplemental Material

Studies S1 and S2

Studies S1 and S2 were designed to further establish the causal effect of intrinsic motivation on feelings of energy within the domain of positive secrets. Study 2 compared information held secret versus information unshared due to external constraints, and building from this, Studies S1 and S2 more directly manipulated the *motivation behind a positive secret*. Study S2 was a replication of Study S1, with a minor adjustment to our measure of positive affect.

Participants and Design. Both studies, using CloudResearch's TurkPrime, recruited 600 participants, seeking 200 participants per study cell. We chose this sample size to be able to detect an effect size of $d = .28$ (with 80% and $\alpha = .05$); 601 Study S1 participants completed the study (325 women, 268 men, 8 other; $M_{\text{age}} = 40.38$, $SD = 13.02$, range = 18-85); and 598 Study S2 participants completed the study (353 women, 243 men, 2 other; $M_{\text{age}} = 41.37$, $SD = 12.74$, range = 18-79).

Participants were randomly assigned to one of three conditions: an intrinsic motivation for the positive secret, an extrinsic motivation for the positive secret, and no specified motivation (neither intrinsic nor extrinsic).

Prompt. Recall that Study 2 had three conditions: intrinsic, extrinsic, and baseline *reasons for the positive information being unknown*. That is, Study 2 manipulated the *reasons* behind the positive information being unknown. Studies S1 and S2 also had three conditions—intrinsic, extrinsic, and baseline—but now Studies S1 and S2 examined specifically positive secrets and manipulated *the motivations behind the positive secret*.

We chose winning a scratch-off (i.e., an instant lottery ticket), because a person could enjoy keeping the positive information to oneself, but also one could keep the secret due to external pressures (i.e., being too embarrassed to reveal the secret to others). In all three prompts, participants were asked to imagine 1) they won a scratch-off, 2) they were embarrassed for having purchased the scratch-off, and 3) nobody currently knew about this. In the baseline condition, no further information was provided. In the extrinsic condition, the vignette specified an extrinsic motivation for keeping the secret. And in the intrinsic condition, the vignette specified an intrinsic motivation for keeping the secret.

Baseline condition. Participants read “Imagine you bought a scratch-off (instant lottery ticket) and you won some money, but you are embarrassed for having bought the scratch-off in the first place. You haven’t told anyone yet. How would this make you feel?”

Extrinsic condition. Participants read “Imagine you bought a scratch-off (instant lottery ticket) and you won some money. You keep it secret. You don’t tell people because you are embarrassed for having bought the scratch-off in the first place. How would this make you feel?”

Intrinsic condition. Participants read “Imagine you bought a scratch-off (instant lottery ticket) and you won some money. You keep it secret. You are embarrassed for having bought the scratch-off, but you are keeping this secret for another reason: you enjoy keeping this to yourself. How would this make you feel?”

Feelings of energy. Next participants completed the feelings of energy scale, which asked how tired, depleted, weak, passive, active, invigorated, strong, energized, awake and alert, and alive they felt (from 1, *not at all* to 7, *very much*; from Slepian et al., 2019). The first four listed items were reverse-coded, and an average was taken so that higher scores on this index indicate feeling more energized ($\alpha = .88$). The order of items was randomized.

Positive affect. In Study S1, we measured the positive affect generated from the *content* of the positive information. Participants read, “Imagine you really did win some money with a scratch-off. How would this make you feel?” and then completed the PANAS-X joy scale (Watson & Clark, 1999): happy, joyful, delighted, and cheerful (from 1, *not at all* to 5, *extremely*; $\alpha=.96$).

Study S2, rather than asking about the content of the information, asked about the entire situation (i.e., the positive information and the motivation behind it being secret), asking, “How would this situation make you feel?” and then completed the same PANAS-X joy scale.

Results

Positive affect. We first conducted independent samples *t*-tests on the positive affect measure, which showed that Study S1 participants experienced the same levels of positive affect across the three conditions (intrinsic motivation $M = 4.39$, $SD = 0.70$, 95% $CI = [4.29, 4.48]$; baseline motivation $M = 4.31$, $SD = 0.78$, 95% $CI = [4.20, 4.42]$; extrinsic motivation $M = 4.30$, $SD = 0.79$, 95% $CI = [4.19, 4.41]$; intrinsic vs. baseline, $t(399) = 1.05$, $p = .296$, $d = 0.10$, 95% $CI = [-0.09, 0.30]$; intrinsic vs. extrinsic, $t(398) = 1.17$, $p = .244$, $d = 0.12$, 95% $CI = [-0.08, 0.31]$; extrinsic vs. baseline, $t(399) = -0.12$, $p = .902$, $d = -0.01$, 95% $CI = [-0.21, 0.18]$). Thus, the motivational conditions did not influence the positive affect generated from the content of the positive information.

Whereas Study S1 measured the positive affect generated from the content of the positive information, Study S2 asked about the whole situation, including the motivation behind the positive information being unknown to others. Study S2 participants experienced the same levels of positive affect across the three conditions (intrinsic motivation $M = 3.80$, $SD = 1.05$, 95% $CI = [3.65, 3.95]$; baseline motivation $M = 3.67$, $SD = 1.10$, 95% $CI = [3.52, 3.83]$; extrinsic

motivation $M = 3.78$, $SD = 1.14$, 95% $CI = [3.62, 3.94]$; intrinsic vs. baseline $t(397) = 1.17$, $p = .241$, $d = 0.12$, 95% $CI = [-0.08, 0.31]$; intrinsic vs. extrinsic $t(395) = 0.15$, $p = .880$, $d = 0.02$, 95% $CI = [-0.18, 0.21]$; extrinsic vs. baseline, $t(398) = 0.98$, $p = .326$, $d = 0.10$, 95% $CI = [-0.10, 0.29]$). Given that all conditions had positive elements (winning money), but negative elements (being embarrassed), despite different motivations behind the information being unknown, participants experienced similar levels of positive affect.

Feelings of energy. In Study S1, participants in the intrinsic motivation condition reported greater feelings of energy ($M = 5.26$, $SD = 1.06$, 95% $CI = [5.12, 5.41]$) than participants in the baseline condition ($M = 4.89$, $SD = 1.11$, 95% $CI = [4.73, 5.04]$), $t(399) = 3.49$, $p = .0005$, $d = 0.35$, 95% $CI = [0.15, 0.55]$. Participants in the intrinsic motivation condition also reported greater feelings of energy than participants in the extrinsic motivation condition ($M = 4.91$, $SD = 1.20$, 95% $CI = [4.74, 5.08]$), $t(391.91) = 3.13$, $p = .002$, $d = 0.31$, 95% $CI = [0.12, 0.51]$.¹ There was no difference between the extrinsic and baseline conditions, $t(399) = 0.21$, $p = .832$, $d = 0.02$, 95% $CI = [-0.17, 0.22]$.

In Study S2, participants in the intrinsic motivation condition reported greater feelings of energy ($M = 5.22$, $SD = 1.05$, 95% $CI = [5.08, 5.37]$) than participants in the baseline condition ($M = 4.90$, $SD = 1.12$, 95% $CI = [4.74, 5.06]$), $t(397) = 2.96$, $p = .003$, $d = 0.30$, 95% $CI = [0.10, 0.49]$. Participants in the intrinsic motivation condition also reported greater feelings of energy than participants in the extrinsic motivation condition ($M = 4.94$, $SD = 1.19$, 95% $CI = [4.77, 5.10]$), $t(395) = 2.55$, $p = .011$, $d = 0.26$, 95% $CI = [0.06, 0.45]$. There was no difference between the extrinsic and baseline conditions, $t(398) = 0.31$, $p = .757$, $d = 0.03$, 95% $CI = [-0.17, 0.23]$.

¹ Levene's Test showed unequal variances, $F = 5.64$, $p = .02$, and so a correction factor was used that did not alter statistical significance.

Finally, we again examined feelings of energy while controlling for positive affect. As in the earlier studies, by entering two dummy variables (1=intrinsic vs. 0=not, and 1=extrinsic vs. 0=not) simultaneously, each coefficient represents the effect of that condition relative to the baseline condition (an approach that is equivalent to an ANOVA within the context of regression modeling).

As can be seen in Tables S1 and S2, when controlling for positive affect, the intrinsic condition was more energizing than the baseline condition in Study S1 (Table S1) and in Study S2 (Table S2), and there was still no effect of extrinsic vs. baseline. Similarly, when controlling for positive affect, the intrinsic condition was more energizing than the extrinsic condition in Study S1 (Table S3) and in Study S2 (Table S4).

Table S1. Predicting feelings of energy, Study S1.

IV	<i>b</i>	95% <i>CI</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intrinsic dummy	.33	.13, .54	.10	3.22	.001
Extrinsic dummy	.03	-.17, .23	.10	0.29	.771
Positive affect	.58	.47, .69	.06	10.43	<.0001

Note: df = 597. Each variable entered simultaneously (when entering both dummy variables simultaneously both effects are relative to the unspecified motivation condition)

Table S2. Predicting feelings of energy, Study S2.

IV	<i>b</i>	95% <i>CI</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intrinsic dummy	.23	.08, .39	.08	2.91	.004
Extrinsic dummy	-.04	-.20, .11	.08	-0.56	.577
Positive affect	.73	.67, .79	.03	24.59	<.0001

Note: df = 594. Each variable entered simultaneously (when entering both dummy variables simultaneously both effects are relative to the unspecified motivation condition)

Table S3. Predicting feelings of energy, Study S1.

IV	<i>b</i>	95% <i>CI</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intrinsic dummy	.30	.10, .51	.10	2.93	.004
Baseline dummy	-.03	-.23, .17	.10	-0.29	.771
Positive affect	.58	.47, .69	.06	10.43	<.0001

Note: df = 597. Each variable entered simultaneously (when entering both dummy variables simultaneously both effects are relative to the extrinsic motivation condition)

Table S4. Predicting feelings of energy, Study S2.

IV	<i>b</i>	95% <i>CI</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intrinsic dummy	.27	.12, .43	.08	3.46	.001
Baseline dummy	.04	-.11, .20	.08	0.56	.577
Positive affect	.73	.67, .79	.03	24.59	<.0001

Note: *df* = 594. Each variable entered simultaneously (when entering both dummy variables simultaneously both effects are relative to the extrinsic motivation condition)

Discussion

Studies S1 and S2 manipulated the motivation—intrinsic versus extrinsic—behind keeping positive information secret. Across both studies, we found that a positive secret motivated by an intrinsic motivation was more energizing than a positive secret motivated by an extrinsic motivation and more energizing than a baseline, unspecified motivation condition, including when controlling for positive affect. An important caveat must be made here which is that it is possible the extrinsic condition had elements of negativity. Critically, vignettes designs used in these supplemental studies (Studies S1 and S2) and in Study 2 are vulnerable to demand explanations for the results, which is why Studies 1, 3, 4, and 5 examine real secrets.

Study 5: Additional Analyses

Subsequent to completing the feelings of energy measure, participants completed the 7-point satisfaction with life scale (Diener, Emmons, Larsen, & Griffin, 1985), and we examined all Study 5 variables as simultaneous predictors of this well-being variable. By controlling for each of the other variables (including when controlling for positive affect), the relationship between feelings of energy and well-being are equivalent to the *b* paths in an indirect effect model, relationships significant in both models ($b = .32$, $SE = .05$, 95% $CI = [.23, .42]$, $t(696) = 6.75$, $p < .0001$, with self-concordance in the model, Table S5; $b = .34$, $SE = .05$, 95% $CI = [.25, .43]$, $t(695) = 7.06$, $p < .0001$, with intrinsic and extrinsic motivation in the model, Table S6), including when controlling for positive affect ($b = .15$, $SE = .05$, 95% $CI = [.05, .26]$, $t(695) = 2.97$, $p = .003$, with self-concordance in the model, Table S5; $b = .17$, $SE = .05$, 95% $CI = [.07,$

.27], $t(694) = 3.27, p = .001$, with intrinsic and extrinsic motivation in the model, Tables S6).

Thus, independent of any other influences on momentary well-being from the other variables, feelings of energy stemming from the prospective reflection were related to higher reports of well-being.

Table S5. Predicting life satisfaction, when accounting for self-concordance and the other variables, Study 5

	<i>Model 1</i>					<i>Model 2 (positive affect entered)</i>				
	<i>b</i>	95% CI	SE	<i>t</i>	<i>p</i>	<i>b</i>	95% CI	SE	<i>t</i>	<i>p</i>
Feelings of energy	.32	.05, 0.23	.05	6.75	< .0001	.15	.05, .05	.05	2.97	.003
Self-concordance	.01	.01, -0.01	.01	1.19	.234	-.003	.01, -.03	.01	-0.30	.765
Intend to reveal	.09	.05, .00003	.05	1.96	.050	.05	.05, -.04	.05	1.01	.313
How soon to reveal	-.06	0.05, -0.15	.05	-1.12	.263	-.06	.05, -.15	.05	-1.14	.257
Condition (positive vs. not)	-.49	.12, -.74	.12	-3.97	.0001	-.64	.12, -.87	.12	-5.23	< .0001
Condition (secret vs. not)	.16	.15, -.13	.15	1.11	.268	.13	.14, -.15	.14	0.93	.352
Positive affect	-	-	-	-	-	.39	.05, .28	.05	7.17	< .0001

Table S6. Predicting life satisfaction, when accounting for intrinsic, extrinsic, and the other variables, Study 5

	<i>Model 1</i>					<i>Model 2 (positive affect entered)</i>				
	<i>b</i>	95% CI	SE	<i>t</i>	<i>p</i>	<i>b</i>	95% CI	SE	<i>t</i>	<i>p</i>
Feelings of energy	.34	.05, .25	.05	7.06	< .0001	.17	.05, .07	.05	3.27	.001
Intrinsic motivation	-.02	.03, -.08	.03	-0.68	.497	-.07	.03, -.14	.03	-2.39	.017
Extrinsic motivation	-.07	.03, -.13	.03	-2.36	.018	-.04	.03, -0.10	.03	-1.60	.111
Intend to reveal	.10	.05, .01	.05	2.13	.033	.05	.05, -.03	.05	1.19	.234
How soon to reveal	-.08	.05, -.18	.05	-1.49	.136	-.08	.05, -.18	.05	-1.65	.099
Condition (positive vs. not)	-.52	.12, -.76	.12	-4.17	< .0001	-.68	.12, -.91	.12	-5.57	< .0001
Condition (secret vs. not)	.05	.16, -.26	.16	0.30	.765	-.02	.15, -.32	.15	-0.16	.875
Positive affect	-	-	-	-	-	.41	.05, .30	.05	7.52	< .0001