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Empirical Research Paper

The Solitude of Secrecy: Thinking About Secrets Evokes Goal Conflict and Feelings of Fatigue

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Abstract

Past research has conceptualized secrecy as speech inhibition during social interaction. In contrast, the current research broadens the understanding of secrecy by conceptualizing it as the commitment to conceal information. Seven experiments demonstrate the implications of this broader conceptualization for understanding secrecy's consequences. The results demonstrate that thinking about secrets—relative to thinking about personal information unknown by others that is *not* purposefully concealed (i.e., undisclosed information)—indirectly increases the experience of fatigue by evoking feelings of isolation and a motivational conflict with one's affiliation goals. Furthermore, we demonstrate that the fatiguing effects of secrecy have consequences for task persistence and performance. Integrating theories of motivation, fatigue, and social isolation, we offer new directions for research on secrecy.

Keywords

secrecy, social isolation, fatigue, motivational conflict, task persistence

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Secrecy is ubiquitous—97% of people, for instance, report having at least one secret at any given moment in time (Slepian, Chun, & Mason, 2017). Furthermore, the negative effects associated with secrecy are numerous, including depression, anxiety, low relationship quality, and poor health symptomatology (Cole et al., 1996; Larson & Chastain, 1990; Larson, Chastain, Hoyt, & 2015; Lehmiller, 2009; Quinn & Chaudoir, 2009; Quinn et al., 2014). The question of how secrecy causes such harm is hampered by a thorny issue: Real-world consequential secrets cannot be realistically or ethically experimentally *created* in the lab (e.g., one cannot assign a participant to cheat on their romantic partner and keep it a secret for 2 years). To explore this question, rather than experimentally try to create a secret (likely to differ in countless ways from a real-wold secret), we experimentally prompt a state that follows from secrecy, and explore its consequences.

We define secrecy as the commitment to conceal information from one or more individuals (Slepian et al., 2017). Two experiences follow from the commitment to conceal information. When required, individuals actively conceal the secret information within relevant social interactions. In addition, individuals find themselves thinking about the secret outside of relevant social interactions. Using a measurement approach, Slepian and colleagues (2017) found that the latter experience correlates more strongly with secrecy's harmful consequences than the former experience. When predicting well-being from both the frequency of concealing a secret within social interactions and the frequency of thinking about a secret outside of those social interactions, only the frequency of thinking about secrets outside of social interactions predicted lower well-being (Slepian et al., 2017; Slepian & Moulton-Tetlock, 2018).

Concealment is the goal of secrecy; therefore, an experience of successful concealment is an example of effective goal pursuit. In contrast, having a secret return to one's thoughts when irrelevant to the context at hand (i.e., mind wandering to the secret) might be taken as a signal of some problem, with negative consequences. Many models of secrecy rest upon the assumption that secrecy is fatiguing, as do intervention models seeking to improve coping with secrecy. Experimental evidence for this supposition, however, is missing, especially with respect to participants' real-world significant secrets. In the current work, we take an experimental approach to this question. We compare and contrast two models of fatigue which parallel the distinction

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between active concealment during social interactions and thinking about secrets outside of social interactions.

We propose that whereas the effort invested in concealing a secret within a social interaction can be fatiguing in a manner consistent with a *resource model* of fatigue, secrecy can cause fatigue via another pathway. Specifically, we propose that merely thinking about one's secret can evoke subjective feelings of fatigue by reminding one of a motivational conflict inherent to secrecy. Secrecy creates a conflict between two goals: The goal to avoid the social costs of the information coming out (Quinn & Chaudoir, 2009; Quinn et al., 2014; Slepian & Bastian, 2017) conflicts with the goal to connect with others and maintain intimacy in close relationships by sharing the secret information (Collins & Miller, 1994; Jourard, 1971; Laurencau, Barrett, & Pietromonaco, 1998; Miller & Kenny, 1986; Reis & Shaver, 1988). Recent work suggests that people experience such motivational conflicts as fatiguing (Kurzban, Duckworth, Kable, & Myers, 2013; Saunders & Inzlicht, 2016). Thus, thinking about secrets might induce subjective feelings of fatigue by making this motivational conflict accessible and highlighting individuals' social isolation with the secret information.

Secrecy and Fatigue

Active Concealment and a Resource Model of Fatigue

Active and effortful concealment of secret information during social interaction can be fatiguing in the same way that inhibition can be fatiguing—by consuming mental resources (Wegner, 1994). For example, Lane and Wegner (1995) found that when a second task requires cognitive resources, suppression of a target thought is likely to fail. This seminal research demonstrated that suppression of a secret thought (when under cognitive load) leads to intrusive rebound, suggesting that the act of inhibition can be fatiguing. Pennebaker (1989) similarly proposed that suppressing personal trauma is cognitively demanding, which over time acts as a cumulative stressor.

Critcher and Ferguson (2014) asked participants to avoid uttering either commonly used words like "don't" or "very" or easily avoidable words like "breakfast," during a mock interview. Participants who had to exert effort to avoid uttering common words performed worse on a subsequent Stroop task. Similarly, Critcher and Ferguson (2014) asked heterosexual individuals not to provide any information about their sexual orientation in a mock interview. What made this difficult is that the interviewer asked questions about their ideal dating partner, requiring participants to monitor their speech for pronouns like "he," "she," "him," or "her." They found that having to monitor such highly common words like "he" and "don't" in speech is difficult and depleting. Thus, secrecy defined as inhibition of speech should be fatiguing through the consumption of mental resources.

Commitment to Conceal and an Affective Model of Fatigue

Although secrecy may require individuals to occasionally engage in speech inhibition during social interactions, the psychological experience of secrecy extends beyond these moments of active concealment. For instance, people frequently mind-wander to their secrets outside of social interactions. We propose that outside moments of concealment, secrecy can still be fatiguing. Yet, thinking about a secret should *not* necessarily be more resource-consuming than thinking about other matters (e.g., solving an algebra problem, balancing a household's budget). Therefore, we would not expect thinking about secrets to produce fatigue as a state of depleted mental resources in our studies. In contrast, we expect thinking about secrets to induce a fatigue defined by an affective model of fatigue, one based in the unpleasant experience of thinking through a motivational conflict.

Fatigue is often used interchangeably to denote two different (albeit related) states. A resource model of fatigue defines fatigue as a state of reduced energy, which occurs after engaging in tasks that consume resources, such as after a long run, or after spending hours writing a paper. In contrast, an affective model of fatigue refers to a different state, one that is based in the motivation to sustain engagement with demanding tasks (Saunders & Inzlicht, 2016).

Subjective feelings of fatigue can result even when holding constant biologically based energy. For example, we can grow weary of a boring seminar talk without the talk actually reducing our reserves of energy. The inner conflict in this example is between the motivation to disengage from the boring seminar talk and the motivation to behave in accordance with role expectations and social norms of paying attention or not leaving the room mid-talk. When a task highlights this kind of motivational conflict, individuals experience feelings of fatigue (Kurzban et al., 2013; see also Lewin, 1935).

We propose that thinking about one's secret evokes such a motivational conflict. On one hand, the secret represents one's goal to avoid the reputational or relational costs that might ensue whether the information got out. On the other hand, the secret highlights one's self-enforced inability to connect with others with respect to the secret, such as to obtain their emotional comfort or their advice and guidance.

We propose that to the extent a secret evokes this motivational conflict, it will be experienced as subjectively fatiguing. That is, a given sceret may evoke no motivational conflict, which we would not expect to fatigue. For example, sometimes thinking about a secret can be a useful exercise, such as thinking through coping strategies, or thinking about whom one can confide in. Thinking about a secret should produce feelings of fatigue only to the extent that it evokes a

motivational conflict related to one's relational goals. We test this hypothesis across a variety of content domains of secrets. We also examine downstream consequences, including reduced task engagement, persistence, and performance.

Research Overview

Participant Samples

Participant population and time of day. The few studies that exist on real-world secrecy have examined college students' secrets, presenting a rather narrow slice of the range of secrets individuals keep (e.g., "drinking/partying"; Vangelisti, 1994). To achieve a more diverse sample of participants and secrets, we conducted our studies using online participants recruited via Mechanical Turk (MTurk; Buhrmester, Kwang, & Gosling, 2011; Gosling, Sandy, John, & Potter, 2010; Mason & Suri, 2012). This method also provides participants with complete anonymity (that cannot be achieved in the physical laboratory). In addition, MTurk is a population which demonstrates similar patterns of, and experience with, secrecy as other nationally representative samples (Slepian et al., 2017). All studies were posted at approximately 12 p.m. ET and were generally completed before 6 p.m. ET, a timing choice that was deliberate (i.e., we sought to avoid fatigue effects in the evening, and fatigue effects that might exist in the morning, particularly among those on the west coast).

Sample size and a priori data exclusions. In the first five experiments, we posted our study for 200 participants, basing our sample size on prior work that used a secrecy recall paradigm (Slepian & Bastian, 2017). For a simple test of mean differences, this sample size can detect Rosenthal's effect size $r = .20$ with power = 80% and $\alpha = .05$. Moreover, this sample size exceeds $N = 148$ needed to find significant indirect effects with small-to-medium a and b paths (power = .80, $\alpha = .05$; Fritz & MacKinnon; 2007). Our final two experiments doubled this sample size when examining the presence of potential order effects. We analyzed all participants' data with the exception of participants who failed to meet the following a priori exclusion criteria.

Participants who did not recall personal information (in response to experimental prompts) and participants who did recall personal information but later admitted to fabricating it were excluded from analysis. In addition, to ensure no repeat participants (both within the current work and across the authors' research program), those who previously participated in a study on secrecy were excluded from analysis. We report in each of the studies exactly how many participants were excluded based on these a priori criteria.

Independent Measures

We compared participants' personal secrets to participants' undisclosed personal information. That is, across our studies, *in both conditions we asked participants to think about significant personal information that other people do not know about.* In our *secret* conditions, participants were asked to think about significant personal information that they have committed to keep secret from others. In our *undisclosed* conditions, participants were asked to think of significant personal information that is presently unknown by others, but that they do *not* intend to keep secret; rather, they would be willing to discuss it if it came up in conversation. Participants were instructed to write that they do not have something that fits the prompt if this was the case.

Control Measures

Significant personal information that individuals intend to conceal likely differs in meaningful ways from significant personal information that individuals do not intend to conceal. Hence, the current work measures and controls for a variety of factors: In Experiments 1 to 5, we controlled for the importance and valence of the information. In Experiments 2 to 4, we controlled for domain-relevant discrete emotions, including shame, guilt, embarrassment, and excitement (each assessed with a single item). Experiment 4 also controlled for how frequently people attempt to suppress the information as well as how distracting are thoughts of the information when it comes to mind. Finally, Experiments 6 and 7 used multi-item measures of negative affect (NA) to control for negative emotional states (Positive and Negative Affect Schedule–Expanded Form [PANAS-X]; Watson & Clark, 1999). Across our seven experiments, we consistently find effects of secrecy above and beyond these factors.

Dependent Measures

Mediators. We predict that, to the extent thinking of a secret (vs. non-secret undisclosed information) evokes a motivational conflict, participants will experience greater feelings of fatigue. Given that the motivational conflict inherent to secrecy revolves around affiliation goals, in Experiments 1 to 5 we measure feelings of *social isolation* as a proxy for the motivational conflict inherent to secrecy.

That is, the more one's goal to keep the secret to avoid the relational costs associated with disclosing it conflicts with the desire to connect with others and obtain their support, the more one should feel socially isolated with the secret. We initially chose this measure because it is closely related to the motivational conflict we describe and is easy to introspect about and report (relative to the intensity of a motivational conflict).

In Experiment 7, we provide complementary evidence for our hypothesized psychological process by measuring the motivational conflict directly (i.e., the extent to which the secret conflicts with participants' affiliation goals).

Outcomes. In Experiments 1 to 4 and 6 to 7, feelings of fatigue served as our dependent measure. In Experiment 5, we examined behavioral outcomes of fatigue: persistence

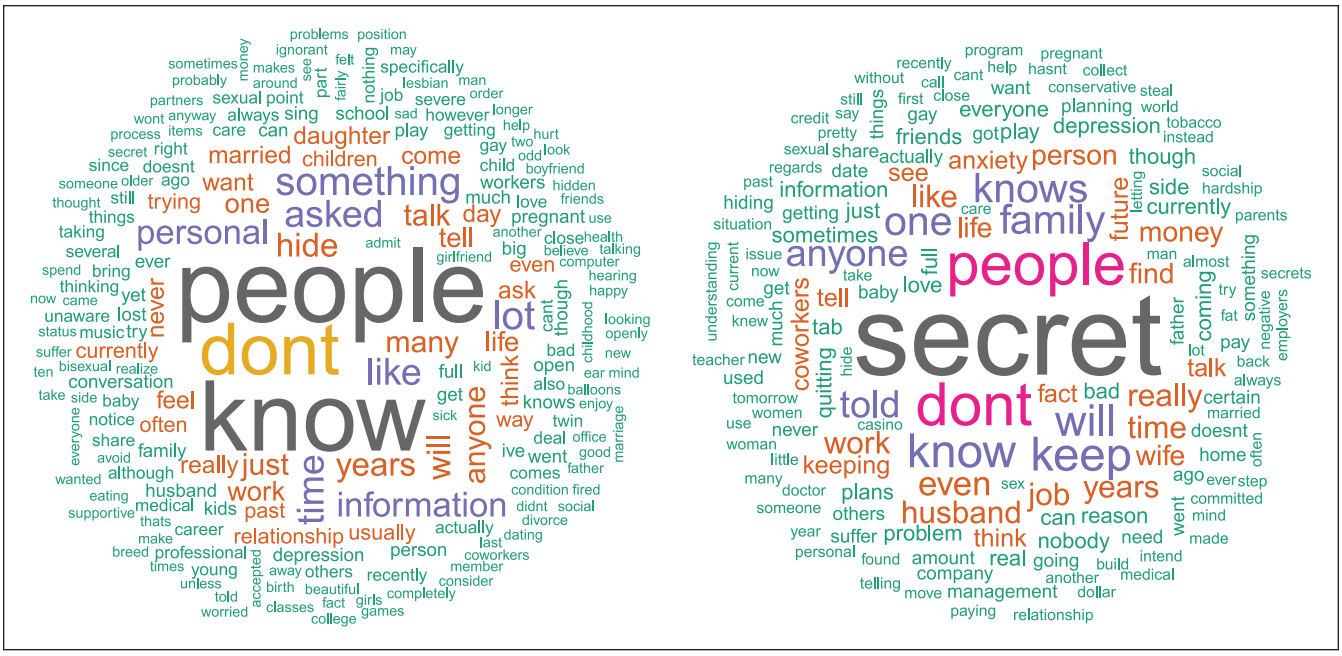

Figure 1. Word clouds generated from most frequent words used by participants in the undisclosed condition (left) and the secret condition (right), Experiment 1.

Note. All word clouds generated remove stopwords from the R-package:tm, and the word "pertains" (frequently used as the word itself appeared in the prompt: "Without revealing specific details, we are curious what this personal information pertains to").

and performance on a cognitive task. Across the seven experiments, we explore a variety of content domains and boundary conditions for the hypothesized indirect effect of secrecy on feelings of fatigue.

Experiment 1

Experiment 1 tested the hypothesis that recalling a secret increases feelings of fatigue indirectly, through increased feelings of social isolation. Our measure of social isolation assessed how much participants felt alone with the information, and not chronic and generalized feelings of social isolation.

Participants and Design

We recruited 200 MTurk participants, but 208 individuals completed the study (115 women, 93 men; M_{age} = 33.49 years, SD = 10.95).[1] We randomly assigned participants to one of the two conditions. In the *secret* condition, participants were asked to think of significant personal information that was unknown by others *and that they were purposefully keeping secret*. In the *undisclosed* condition, we asked participants to think of significant personal information that was unknown by others, but that they were *not* purposefully concealing; rather, they would be willing to discuss it with others if the issue came up in conversation. In both conditions, we asked participants to write four to five sentences about that personal information.

Social isolation. Next, participants responded to three items that assessed perceived *social isolation*: "How much does keeping this secret [does having this information unknown by others] make you feel disconnected from other people?" "How isolated from other people does keeping this secret [does having this information unknown by others] make you feel?" and "How alone do you feel with this information?" Responses used rating scales that ranged from 1 (*not at all*) to 7 (*very*), α = .92.

Feelings of fatigue. Participants subsequently rated on the same 7-point scales how much they felt tired, depleted, weak, passive, energized, alive, active, invigorated, strong, awake, and alert (adapted from Ryan & Frederick's, 1997, subjective vitality scale; see also Bostic, Rubio, & Hood, 2000). Items were presented in a random order. We reverse-scored items indicating greater energy and averaged the items to create an index of feelings of fatigue for each participant (α = .89).

Controls. Although both groups of participants recalled personal information unknown by others, the kinds of things people choose to keep secret will likely differ from the kinds of things people a do *not* intentionally keep secret. To account for this possibility, participants rated how important the personal information was from 1 (*not at all*) to 7 (*very*) and the valence of the personal information from 1 (*very negative*) to 7 (*very positive*), with midpoint 4 labeled *neither negative nor positive*.

Exclusions. Twelve participants indicated they did not have personal information that fit the prompt ($n_{secrecy}$ = 7, $n_{undisclosed}$ = 5). Four participants later indicated during a final honesty check that the personal information they described was fabricated ($n_{secrecy}$ = 2, $n_{undisclosed}$ = 2). Finally,

Table 1. Effect of Secrecy on Social Isolation and Feelings of Fatigue (Experiment 1).

Outcome variable	Secret			Undisclosed			*t* test (*df* = 167)		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Isolation	4.49	1.83	[4.08, 4.90]	3.16	1.83	[2.78, 3.54]	4.72	<.0001	0.73	[0.41, 1.04]
Fatigue	4.22	1.53	[3.88, 4.56]	3.51	1.39	[3.22, 3.80]	3.17	.002	0.49	[0.18, 0.79]

Note. CI = confidence interval.

Table 2. Valence and Importance of the Recalled Information by Condition (Experiment 1).

Control variable	Secret			Undisclosed			*t* test (*df* = 167)		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Valence	3.65	1.98	[3.20, 4.09]	4.23	1.91	[3.83, 4.63]	−1.96	.05	−0.30	[−0.61, 0.002]
Importance	5.30	1.64	[4.94, 5.67]	5.34	1.74	[4.98, 5.71]	−0.16	.87	−0.02	[−0.33, 0.28]

Note. For valence, higher numbers indicate more positive valence. CI = confidence interval

Table 3. Independent Effects on Fatigue in Experiment 1.

Predictor	Model 1			Model 2			Model 3		
	b (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Isolation	0.34 (0.06) [0.23, 0.45]	6.09	<.0001				0.24 (0.05) [0.14, 0.33]	5.07	<.0001
Secrecy	0.26 (0.22) [−0.17, 0.69]	1.20	.23				0.14 (0.17) [−0.19, 0.48]	0.83	.41
Valence				−0.50 (0.04) [−0.59, −0.42]	−11.33	<.0001	−0.43 (0.04) [−0.52, −0.35]	−10.12	<.0001
Importance				0.04 (0.05) [−0.06, 0.14]	0.81	.42	−0.02 (0.05) [−0.11, 0.08]	0.37	.72

Note. CI = confidence interval.

23 participants indicated they had recently participated in a study on secrecy. To ensure our final sample did not include participants who had completed a similar procedure, these participants were excluded from analysis, leaving a final sample of 169 participants.

Results and Discussion

As can be seen from the word clouds generated by the most frequent words used, participants recalled secrets in the secrets condition, but undisclosed (non-secret) information in the control condition (Figure 1).

Participants who recalled secrets reported feeling significantly more socially isolated and fatigued than did participants recalling undisclosed personal information that was not kept secret (Table 1).

Indirect effect. We next examined whether recalling secret, relative to undisclosed, information led to feelings of fatigue through feelings of social isolation. A bootstrapped mediation analysis (with 5,000 iterations; Hayes, 2009) found a significant indirect effect of information condition on feelings of fatigue through feeling alone with the recalled information, *M* indirect effect = 0.4516, *SE* = 0.1175, 95% confidence interval [CI] = [0.2517, 0.7162].

Controls. We next examined whether our effects existed above and beyond the valence and importance of the information. The recalled secrets were marginally more negative than the recalled non-secret undisclosed information (Table 2; see the Appendix for zero-order correlations of control variables, Table A1).

When entering all variables as predictors of feelings of fatigue, feelings of isolation predicted fatigue (as did the valence of the information; Table 3).

The indirect effect of information condition on feelings of fatigue through feelings of social isolation remained significant when including the other predictors, *M* indirect effect = 0.3131, *SE* = 0.0920, 95% CI = [0.1606, 0.5219].

Recalling significant personal information that was unknown by others that one committed to conceal (vs. did not commit to conceal) increased feelings of fatigue through

evoking feelings of social isolation. This indirect effect was found over and above the importance and valence of the personal information unknown by others.

Experiments 2, 3, and 4

Experiment 1 found that thinking about secret (vs. non-secret) personal information that is unknown by others results in feelings of fatigue, through evoking feelings of social isolation. Although Experiment 1 accounted for how important and negative the information was, perhaps the conditions still differed in ways that were not measured. Experiments 2, 3, and 4 addressed this concern by constraining the recall task to particular domains and examining additional control variables.

In Experiment 2, participants in both conditions specifically recalled personal information unknown by others that they felt bad about (i.e., "something you consider significant and you feel bad, ashamed, or embarrassed by"). These revised instructions aimed to make the secret and undisclosed conditions more similar to each other (i.e., both dealing with negative significant personal information unknown by others), with the only difference being that in one condition participant sought to keep that information unknown by others.

Experiment 3 then examined secrets that people might view less negatively by having participants recall ambitions that they have, of which other people did not know about. Experiment 4 considered the likelihood of the information coming up in conversation. That is, perhaps the reason that undisclosed information remains unknown by other people is simply because it almost never comes up in conversation, whereas the content of secrets is more likely to come up in conversation. To account for this possibility, Experiment 4 constrained the domain of recall to significant personal information unknown by others that very rarely comes up in conversations. Experimenters 2, 3, and 4 also included a series of control variables designed to increase our confidence that the results were not driven by differences between conditions.

Participants and Design

We recruited 200 MTurk workers for each experiment; 204 completed Experiment 2 (114 women, 90 men; M_{age} = 34.02 years, SD = 11.39), 211 completed Experiment 3 (112 women, 99 men; M_{age} = 33.94 years, SD = 11.23), and 224 completed Experiment 4 (132 women, 92 men; M_{age} = 34.48 years, SD = 11.17).[1]

In Experiment 2, participants were asked to think of personal information that they felt bad, ashamed, or embarrassed by that was unknown by others. In Experiment 3, participants were asked to recall ambitions that were unknown by others. In Experiment 4, participants were asked to think of personal information that was unknown by others and very rarely came up in conversation.

In each study, participants were randomly assigned to the *secret* or *undisclosed* conditions from Experiment 1: secrecy (personal information unknown by others that the participant sought to keep unknown) versus undisclosed (personal information that the participant did not intend to keep secret, but is currently unknown by others).

Exclusions were as follows for Experiments 2, 3, and 4, respectively. Participants who indicated that they did not have personal information that fit the prompt were excluded from analysis ($n_{secrecy}$ = 7, 2, and 0, $n_{undisclosed}$ = 1, 3, and 0). Of the remaining participants, those who later indicated, during an honesty check, that they made up the personal information that they described were also excluded ($n_{secrecy}$ = 3, 7, and 5, $n_{undisclosed}$ = 3, 7, and 11). Finally, 26, 22, and 22 of the remaining participants indicated they had recently participated in a study on secrecy and were excluded to ensure no repeat participants across studies. The final sample sizes in Experiments 2, 3, and 4 were 164, 176, and 186 participants, respectively.

Participants completed the same measure of social isolation (αs = .90, .92, and .91) as a proxy for the motivational conflict inherent to secrecy and feelings of fatigue (αs = .79, .88, and .85) from Experiment 1.

Controls

As in Experiment 1, participants completed measures of the importance and valence of the recalled personal information to ensure that any effects were not contingent on differences on these variables across conditions.

In Experiment 2 (information participants felt bad, ashamed, or embarrassed by), it is possible that those who recalled secrets felt more *shame* and *guilt*. Experiment 2 participants thus rated how much the information made them feel shame (1 = *none at all*, 7 = *very much*), and guilty and motivated to take action (1 = *do not feel guilty and do not want to do something about it*, 7 = *feel very guilty and very much want to do something about it*). The action-based wording for guilt was used to more clearly differentiate it from shame (Ellsworth & Smith, 1988; Slepian, Kirby, & Kalokrinos, 2018).

In Experiment 3, perhaps participants' secret ambitions made them feel *embarrassed* or *excited*. Thus, Experiment 3 participants also rated how excited and embarrassed they were about their ambition on scales ranging from 1 (*not at all*) to 7 (*very*).

Experiment 4 participants rated two additional variables. It is possible that people suppress thoughts of their secrets more frequently and find them more distracting (as a consequence of intrusive thoughts), which might explain the effect of secrecy on feelings of fatigue. Experiment 4 thus asked participants how much they sought to suppress the secret, process the secret, and how distracting thoughts of the secret were (Table 9).

Results

Word clouds depicting the most commonly used words in each condition are presented in Figure 2.

Figure 2. Word clouds generated from most frequent words used by participants in the undisclosed condition (left) and the secret condition (right) and by domain of recall.

Note. Top: Experiment 2, personal information participants felt bad, ashamed, or embarrassed by (notice "bad," "feel"); middle: Experiment 3, ambitions (notice "ambition," "want"); bottom: Experiment 4, information that very rarely comes up in conversation (notice "years," "time").

Table 4. Effects of Information Condition on Social Isolation (Experiments 2-4).

	Secret			Undisclosed			*t* test		Effect size	
Experiment	*M*	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
2 (negative info)	4.44	1.89	[4.03, 4.86]	3.31	1.82	[2.91, 3.71]	3.91	.0001	0.61	[0.30, 0.92]
3 (ambitions)	3.48	1.69	[3.11, 3.85]	2.65	1.53	[2.34, 2.97]	3.40	.0008	0.51	[0.21, 0.81]
4 (rarely discussed)	4.26	1.81	[3.88, 4.64]	3.28	1.88	[2.90, 3.66]	3.62	.0004	0.53	[0.24, 0.82]

Note. df = 162, 174, and 184 in Experiments 2, 3, and 4, respectively. CI = confidence interval.

Table 5. Experiments 2, 3, and 4: Feelings of Fatigue by Condition.

	Secret			Undisclosed			*t* test		Effect size	
Experiment	*M*	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
2 (negative info)	4.78	1.10	[4.53, 5.02]	4.31	1.20	[4.05, 4.57]	2.59	.01	0.40	[0.09, 0.71]
3 (ambitions)	2.71	1.13	[2.46, 2.95]	2.84	1.14	[2.60, 3.07]	−0.76	.45	−0.11	[−0.41, 0.18]
4 (rarely discussed)	4.28	1.27	[4.01, 4.54]	3.78	1.23	[3.53, 4.04]	2.69	.008	0.40	[0.10, 0.68]

Note. df = 162, 174, and 184. CI = confidence interval.

Table 6. Indirect Effects of Secrecy on Feelings of Fatigue via Social Isolation (Experiments 2, 3, and 4).

Experiment	IE	*SE*	95% CI
2 (negative info)	0.1517	0.0705	[0.0419, 0.3203]
3 (ambitions)	0.1554	0.0684	[0.0516, 0.3223]
4 (rarely discussed)	0.2382	0.0792	[0.1087, 0.4246]

Note. IE = indirect effect; CI = confidence interval.

Social isolation. Participants who recalled secrets reported feeling significantly more alone with that information than did participants who recalled undisclosed information (Table 4). This effect emerged in each experiment, whether participants recalled personal information they *felt bad about* (Experiment 2), *ambitions* (Experiment 3), or personal information that *very rarely comes up in conversation* (Experiment 4).

Feelings of fatigue. Participants who recalled secrets reported feeling significantly more fatigued than participants who recalled undisclosed personal information that was not purposefully concealed, both in Experiment 2 and Experiment 4, but not in Experiment 3 (Table 5).

Indirect effect. A bootstrapping mediation analysis (with 5,000 iterations; Hayes, 2009) found evidence for a significant indirect effect of information recall on feelings of fatigue through feeling alone with the information in each of the three experiments (Table 6).

Controls. For zero-order correlations of control variables (Tables A2-A4), see the Appendix. In Experiment 2, participants' secrets were significantly more negative, shame-evoking, and guilt-evoking than participants' undisclosed personal information, but no more important (Table 7).

In Experiment 3, participants in the secret condition recalled ambitions that they were more embarrassed by, but were no more negative, important, or exciting than the ambitions recalled in the undisclosed information condition (Table 8).

In Experiment 4, participants' secrets were more negative, embarrassing, shameful, and less exciting, but no more important than participants' undisclosed information. Furthermore, the two conditions were equivalent in terms of individuals' tendencies to think through and process the information (Table 9). Participants sought to suppress thoughts of secrets more than undisclosed information, but did not find thoughts of secrets any more distracting. This finding is consistent with research that shows people develop effective suppression strategies for naturally unwanted thoughts (Hu, Bergström, Gagnepain, & Anderson, 2017; Kelly & Kahn, 1994). Importantly, the effect of social isolation on feelings of fatigue remained when including all controls (Table 10: A, B, and C). Correspondingly, the indirect effect of secrecy leading to feelings of fatigue through social isolation remained significant in each study, when including the control variables (Table 11).

Discussion

Regardless of the specific domain, when participants recalled secret information, they felt more alone with that information than when it was simply unknown to others. Note that although in three of four experiments (Experiments 1, 2, and 4) recalling secret (vs. undisclosed) information led directly to feelings of fatigue, our theorizing focuses on the indirect effect via social isolation, which we use as a proxy for the motivational conflict inherent in secrecy. Indeed, in all four studies, recalling secret (vs. undisclosed) information led to feelings of fatigue through evoking feelings of social isolation. This indirect effect survived a series of controls including levels of importance, valence, embarrassment, shame,

Table 7. Valence, Importance, Shame, and Guilt Associated With Recalled Information by Condition (Experiment 2).

Control variable	Secret			Undisclosed			*t* test (*df* = 162)		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Valence	2.27	1.21	[2.00, 2.54]	3.00	1.58	[2.65, 3.35]	−3.30	.001	−0.52	[−0.83, −0.20]
Importance	5.30	1.58	[4.95, 5.64]	5.53	1.40	[5.22, 5.84]	−1.00	.32	−0.16	[−0.46, 0.15]
Shame	4.90	1.76	[4.51, 5.29]	4.14	2.14	[3.68, 4.61]	2.47	.01	0.32	[0.08, 0.69]
Guilt	4.49	2.05	[4.04, 4.95]	3.83	2.09	[3.37, 4.29]	2.05	.04	−0.16	[0.01, 0.63]

Note. CI = confidence interval.

Table 8. Valence, Importance, Embarrassment, and Excitement Associated With Recalled Information by Condition (Experiment 3).

Control variable	Secret			Undisclosed			*t* test (*df* = 174)		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Valence	6.23	1.06	[6.00, 6.46]	6.42	0.94	[6.23, 6.61]	−1.26	.21	−0.19	[−0.49, 0.11]
Importance	5.81	1.20	[5.54, 6.07]	6.06	1.08	[5.84, 6.29]	−1.49	.14	−0.23	[−0.52, 0.07]
Embarrassing	2.40	1.89	[1.98, 2.81]	1.81	1.33	[1.53, 2.08]	2.42	.02	0.37	[0.07, 0.66]
Exciting	5.70	1.59	[5.35, 6.05]	5.72	1.33	[5.45, 5.99]	−0.10	.92	−0.01	[−0.31, 0.28]

Note. CI = confidence interval.

Table 9. Control Variables by Condition (Experiment 4).

Control variable	Secret			Undisclosed			*t* test (*df* = 184)		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Valence[a]	2.87	1.42	[2.57, 3.16]	4.37	1.97	[3.97, 4.77]	−5.96	.001	−0.87	[−1.17, −0.57]
Importance	5.43	1.44	[5.13, 5.73]	5.79	1.35	[5.51, 6.06]	−1.76	.08	−0.26	[−0.55, 0.03]
Embarrassing	4.63	2.12	[4.18, 5.07]	2.97	2.15	[2.53, 3.41]	5.29	.001	0.78	[0.48, 1.07]
Shameful	4.38	2.03	[3.96, 4.81]	2.85	2.19	[2.41, 3.30]	4.94	.001	0.73	[0.43, 1.02]
Exciting[a]	2.18	1.86	[1.79, 2.56]	3.19	2.21	[2.74, 3.64]	−3.39	.001	−0.50	[−0.79, −0.2]
Seek to process	3.27	1.72	[2.92, 3.63]	3.20	1.69	[2.86, 3.54]	0.30	.77	0.04	[−0.24, 0.33]
Seek to suppress	3.34	1.89	[2.95, 3.73]	2.76	1.81	[2.39, 3.13]	2.15	.03	0.31	[0.03, 0.60]
Distracting	3.41	1.94	[3.00, 3.81]	3.29	2.08	[2.87, 3.72]	0.38	.71	0.06	[−0.23, 0.34]

Note. df = 171.13 (valence) and 181.04 (exciting). Seek suppress: "How much of the time WHEN you are thinking about your personal information do you try to simply push it out of your mind?" (1 = *almost never*, 2 = *once in a while*, 3 = *sometimes*, 4 = *a good amount*, 5 = *frequently*, 6 = *quite frequently*, 7 = *all the time*); Seek process: "How much of the time WHEN you are thinking about your personal information do you try to think about ways forward (i.e., think about the information, think about who you can talk to, think about how to solve this problem, think about how to handle the personal information, what to do next, etc." (1 = *not at all* to 7 = *very much*); Distracting: "How distracted are you by thoughts of your secret/personal information?" (1 = *not at all* to 7 = *very much*). CI = confidence interval.

[a]Variances significantly differed, and thus a correction factor was used that did not alter statistical significance.

guilt, excitement, and motivation to think of, and suppress, the personal information as well how distracting intrusive thoughts of that information are when they come to mind.

Experiment 5

In Experiment 5, we moved away from self-reports of feelings of fatigue and instead examined behavioral outcomes that should vary as a function of fatigue. When persistence on a task carries no benefits, the fatigued persist less (Muraven & Slessareva, 2003; Saunders & Inzlicht, 2016). We thus next examined whether social isolation from thinking of one's secret reduces persistence and performance on a task that yields no benefits (i.e., solving anagrams with no reward).

Participants and Design

We aimed to recruit 200 participants on MTurk; 221 participants completed the study (137 women, 84 men; M_{age} = 32.62 years, SD = 10.90)[1]. Participants were randomly assigned to the *secret* or *undisclosed* conditions from Experiment 1.

Fifteen participants indicated they did not have personal information that fit the prompt (n_{secret} = 9, $n_{undisclosed}$ = 6). Six participants later indicated that they made up the information they described (n_{secret} = 6, $n_{undisclosed}$ = 0). Finally, 25 participants had indicated they recently participated in a study on secrecy. These participants were excluded from analysis, bringing our final sample to N = 175.

Table 10. Independent effects on fatigue in Experiment 2, 3, and 4.

	Model 1			Model 2			Model 3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
A (E2)									
Isolation	0.13 (0.05) [0.04, 0.23]	2.80	.006				0.10 (0.05) [−0.004, 0.21]	1.91	.06
Secrecy	0.31 (0.18) [−0.05, 0.68]	1.70	.09				0.12 (0.18) [−0.24, 0.48]	0.66	.51
Valence				−0.27 (0.07) [−0.40, −0.14]	−4.16	.0001	−0.27 (0.07) [−0.40, −0.14]	−4.10	<.001
Importance				0.02 (0.06) [−0.10, 0.13]	0.29	.77	0.001 (0.06) [−0.12, 0.12]	0.02	.98
Shame				0.05 (0.07) [−0.08, 0.18]	0.73	.47	0.05 (0.07) [−0.08, .18]	0.71	.48
Guilt				0.04 (0.06) [−0.08, 0.16]	0.72	.47	−0.01 (0.06) [–.13, 0.12]	−0.10	.92
B (E3)									
Isolation	0.19 (0.05) [0.09, 0.29]	3.64	.0004				0.10 (0.05) [0.004, 0.19]	2.06	.04
Secrecy	0.28 (0.17) [−0.62, 0.05]	1.70	.10				−0.29 (0.14) [−0.56, −0.02]	−2.09	.04
Valence				−0.11 (0.08) [−0.27, 0.04]	−1.44	.15	−0.09 (0.08) [−0.25, 0.06]	−1.19	.24
Importance				−0.03 (0.06) [−0.16, 0.10]	−0.46	.65	−0.05 (0.06) [−0.18, 0.08]	−0.78	.43
Embarrass				−0.40 (0.06) [−0.51, −0.29]	−7.11	< .0001	0.07 (0.05) [−0.02, 0.17]	1.56	.12
Excitement				0.10 (0.04) [0.01, 0.18]	2.20	.03	−0.39 (0.06) [−0.50, −0.28]	−7.05	<.0001
C (E4)									
Isolation	0.24 (.05) [0.15, 0.34]	5.19	<.0001				0.12 (0.05) [0.02, 0.21]	2.33	.02
Secrecy	0.26 (.18) [−0.09, 0.61]	1.44	.15				−0.19 (0.16) [−0.51, 0.12]	−1.20	.23
Valence				−0.02 (0.06) [−0.15, 0.11]	−0.30	.76	−0.03 (0.07) [−0.16, 0.11]	−0.38	.70
Importance				−0.12 (0.06) [−0.23, −0.01)]	−2.16	.03	−0.13 (0.06) [−0.24, −0.02]	−2.28	.02
Embarrass				0.10 (0.06) [−0.01, 0.22]	1.74	.08	0.12 (0.06) [0.01, 0.24]	2.06	.04
Shame				0.04 (0.06) [−0.09, 0.16]	−0.55	.58	0.02 (0.06) [−0.11, 0.14]	0.25	.80
Excitement				−0.25 (0.05) [−0.34, −0.15]	−5.20	<.0001	−0.25 (.05) [−0.34, −0.15]	−5.21	<.0001
Seek Process				0.02 (0.05) [−0.07, 0.12]	0.53	.59	0.01 (0.05) [−0.09, 0.10]	0.13	.89
Seek suppress				0.01 (0.05) [−0.08, 0.10]	0.29	.77	0.01 (.05) [−0.08, 0.09]	0.11	.91
Distracting				0.14 (0.05) [0.05, 0.23]	3.01	.003	0.08 (0.05) [−0.02, 0.18]	1.62	.11

Note. CI = confidence interval.

Table 11. Indirect Effects of Secret (vs. Undisclosed) Information on Feelings of Fatigue Through Social Isolation (With Controls; Experiments 2, 3, and 4).

Experiment	IE	*SE*	95% CI
2 (negative info)	0.0870	0.0705	[0.0025, 0.2522]
3 (ambitions)	0.0850	0.0492	[0.0120, 0.2131]
4 (rarely discussed)	0.1125	0.0589	[0.0187, 0.2582]

Note. IE = indirect effect; CI = confidence interval.

Participants completed the same measure of social isolation ($\alpha = .91$) from the prior studies and subsequently proceeded to a word puzzle task. As a measure of pre-performance engagement, we asked how interesting they thought the task would be, how enjoyable it would be, and how much they looked forward to the challenge of the task from 1 (*not at all*) to 7 (*very much*), $\alpha = .95$. Subsequently, participants were presented with 50 solvable anagrams, all on one page, and were asked to solve as many as possible, but were informed that they could move on whenever they wished (there was no incentive provided for the number solved). The length of time spent on the anagram task (in minutes) was our measure of persistence, and the number of anagrams solved was our measure of performance.

Results and Discussion

Word clouds depicting the most commonly used words in each condition are presented in Figure 3.

Social isolation. Participants who recalled secrets reported feeling significantly more alone with that information ($M = 4.35$, $SD = 1.84$, 95% CI = [3.96, 4.74]) than those who recalled undisclosed personal information ($M = 2.96$, $SD = 1.67$, 95% CI = [2.61, 3.32]), $t(173) = 5.23$, $p < .00001$, $d = 0.79$, 95% CI = [0.48, 1.10].

Task persistence and performance. Participants in both conditions expected to be engaged in the anagram task to similar degrees (secret information: $M = 5.30$, $SD = 1.48$, 95% CI = [5.00, 5.63]; undisclosed information: $M = 5.06$, $SD = 1.72$, 95% CI = [4.69, 5.42]), $t(170) = 1.08$, $p = .28$, $d = 0.16$, 95% CI = [−0.13, 0.46]. Thus, the secrecy manipulation did not influence self-reported interest in the task.

Given the unbounded length of time participants could persist on the anagram task, we examined the persistence data for outliers. Rather than excluding outliers based on the number of standard deviations from the mean, we employed an adjusted boxplot method (as in other work; e.g., Slepian et al., 2017; Slepian & Moulton-Tetlock, 2018). Standard deviation–based exclusion is problematic because the standard deviation used to determine the cutoff is itself biased by extreme outliers (Hubert & Vandervieren, 2008; Seo, 2006). The adjusted boxplot instead uses a robust skewness estimator to generate a more accurate representation of the data, and outliers are identified without making parametric assumptions about the distribution of the data (Hubert & Vandervieren, 2008). This method yielded a persistence cutoff of 35.19 min, such that data points beyond this point were considered extreme outliers beyond the mean of 8.01 min ($SD = 7.81$, 95% CI = [6.84, 9.17]); the three participants who spent longer than this cutoff (39.68, 46.30, and 52.08 min) were excluded from analyses on the anagram task (analyses without excluding those who spent an outlying amount of time on the anagrams are presented in the Appendix, Table A8).

Recall that secrets may present a motivational conflict to varying degrees. On one end of the spectrum people may feel at ease with their secret and feel content with having it, whereas on the other end of the spectrum they may feel highly conflicted about the need to keep the secret from others. The affective model of fatigue predicts that only to the extent that engaging in a task creates a conflict, should it produce subjective feelings of fatigue. In other words, thinking of secrets may not directly influence persistence and performance on the task; it might only do so to the extent that thinking of the secret evokes feelings of social isolation, which is our proxy measure for the affiliation-related motivational conflict in secrecy. Indeed, we observed no direct effects of condition on persistence in or performance Experiment 5 (Table 12).

Indirect effect of secrecy on persistence. A bootstrapped mediation analysis (with 5,000 iterations) demonstrated that thinking about secret versus undisclosed information decreased persistence indirectly through increased feelings of social isolation (Table 12).

Indirect effect of secrecy on performance. Similarly, thinking about secret versus undisclosed information decreased performance indirectly through increased feelings of social isolation (Table 12).

Serial indirect effect on performance through persistence. How might the fatiguing effects of social isolation seen in the other studies reduce anagram performance? We suggest the answer lies within persistence. We propose the fatigued persist less, which reduces performance. Persistence predicted anagram performance (controlling for isolation and condition), $b = 1.13$, $SE = 0.15$, 95% CI = [0.84, 1.43], $t(171) = 7.57$, $p < .0001$. Thus, we subsequently examined a serial indirect effect on performance operating through persistence. We bootstrapped (in R with 5,000 iterations) the product of each path (i.e., each regression coefficient controlling for the preceding paths) and took the 95% bias-corrected and accelerated (BCa) bootstrap interval. With this method (equivalent to Model 6 in Hayes, 2012), we found a significant indirect effect. Recalling secrets decreased anagram performance through increasing feelings of isolation, which subsequently reduced persistence (Table 12).

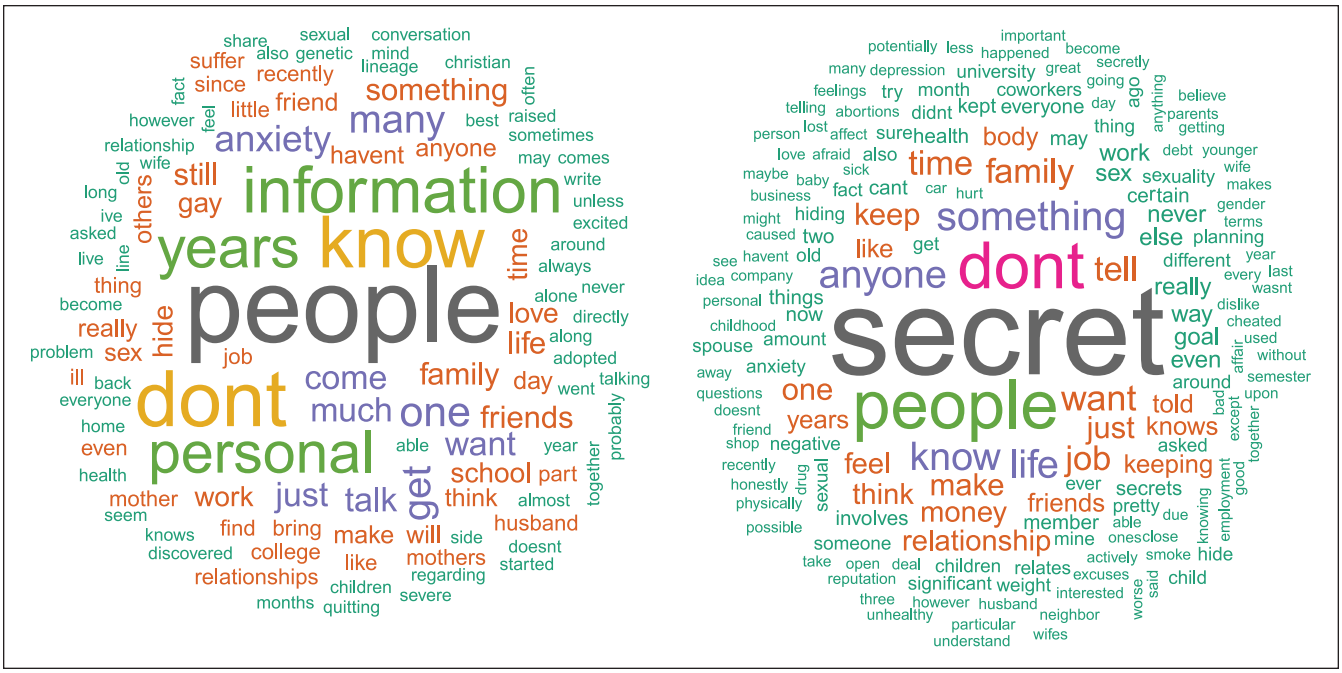
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Table 14. Independent Effects on Persistence and Performance in Experiment 5.

	Model 1			Model 2			Model 3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Persistence									
Isolation	−0.79 (0.26) [–1.31, −0.28]	−3.06	.003				−0.94 (0.28) [–1.49, −0.38]	−3.34	.001
Secrecy	1.95 (0.96) [0.06, 3.84]	2.04	.04				2.08 (0.98) [0.13, 4.02)]	2.11	.04
Valence				−0.05 (0.24) [−0.53, 0.43]	−0.22	.83	−0.04 (0.24) [−0.52, 0.43]	−0.18	.86
Importance				0.03 (0.25) [−0.47, 0.53]	0.11	.91	0.35 (0.27) [−0.17, 0.88]	1.34	.18
Performance									
Isolation	−1.82 (0.76) [–3.33, −0.31]	−2.38	.02				−1.97 (0.83) [–3.60, −0.34]	−2.38	.02
Secrecy	0.96 (2.82) [–4.61, 6.53]	0.34	.73				0.45 (2.91) [–5.29, 6.19]	0.15	.88
Valence				−0.57 (0.70) [–1.96, 0.82]	−0.82	.42	−0.79 (0.72) [–2.21, 0.62]	−1.11	.27
Importance				−0.46 (0.74) [–1.92, 0.99]	−0.63	.53	0.23 (0.78) [–1.32, 1.77]	0.29	.77
Persistence to performance									
Persistence	1.58 (0.19) [1.20, 1.96]	8.21	<.0001				1.58 (0.19) [1.20, 1.97]	8.19	<.0001
Isolation	−0.57 (0.67) [–1.88, 0.75]	−0.85	.40				−0.49 (0.72) [–1.91, 0.94]	−0.67	.50
Secrecy	−2.11 (2.42) [–6.89, 2.67]	−0.87	.38				−2.84 (2.49) [–7.77, 2.08]	−1.14	.26
Valence				−0.46 (0.74) [–1.92, 0.99]	−0.63	.53	−0.73 (0.61) [–1.92, 0.47]	−1.29	.23
Importance				−0.57 (0.70) [–1.96, 0.82]	−0.82	.42	−0.33 (0.67) [–1.65, 0.98]	−0.50	.62

Note. For valence, higher numbers indicate more positive valence. CI = confidence interval.

Table 15. Indirect Effects of Secrecy on Persistence and Performance (Including Controls; Experiment 5).

Indirect effect paths	IE	*SE*	95% CI
Secret → Isolation → Persistence	−1.2976	0.5169	[–2.5750, −0.4818]
Secret → Isolation → Performance	−2.7328	1.3695	[–5.7549, −0.4689]
Secret → Isolation → Persistence → Performance	−0.4582	0.2410	[–1.0374, −0.0751]

Note. IE = indirect effect; CI = confidence interval.

Experiments 1 to 5 used feelings of social isolation as a proxy for the motivational conflict inherent to secrecy. By keeping a secret, one avoids the relational costs of the information coming out, but constraints oneself with regard to connecting with others (as sharing information is a fundamental way in which people connect with others; Jourard, 1971; Laurencau et al., 1998; Miller & Kenny, 1986; Reis & Shaver, 1988).

Experiments 6 and 7 had three notable features relative to the previous experiments. First, whereas Experiments 1 to 5 used single-item face-valid measures to assess negative affective states as control variables, Experiments 6 and 7 used multi-item measures of negative affective states. Second, in each of the prior studies, our proposed mediator was measured before the dependent measure, making it possible that the effects were contingent on that order of measurement. To

address this, we counterbalanced the order of our measures and doubled the sample size, such that one cell had an alternate order of measures with a sample size that was equivalent to that of the prior studies. Third, Experiment 7 measured the motivational conflict inherent to secrecy directly.

Participants and Design

In both Experiments 6 and 7, we recruited 400 participants on MTurk; 406 completed the study in Experiment 6 (220 women, 186 men; M_{age} = 35.32 years, SD = 11.02), and 401 completed the study in Experiment 7 (233 women, 168 men; M_{age} = 36.22 years, SD = 11.72).[1] Participants were randomly assigned to the *secret* or *undisclosed* conditions from Experiments 1 and 5.

Exclusions were as follows for Experiment 6 [Experiment 7 in brackets]: 22 [26] participants indicated that they did not have personal information that fit the prompt (n_{secret} = 15 [20], $n_{undisclosed}$ = 7 [6]); 7 [7] participants later indicated that the personal information they described was fabricated (n_{secret} = 4 [6], $n_{undisclosed}$ = 3 [1]), and 37 [41] participants had recently participated in a study on secrecy. These participants were thus excluded from analysis per our a priori criteria. The final sample of Experiment 6 was thus N = 377 and Experiment 7, N = 368.

Participants completed the dependent measure of feelings of fatigue from Experiments 1 to 4 (Experiment 6, α = .88; Experiment 7, α = .89) and the mediator measure—which in Experiment 6 was the measure of social isolation from the prior studies (α = .91) and in Experiment 7 was a measure of motivational conflict (α = .92)—with the order counterbalanced for both studies.

The measure of motivational conflict employed in Experiment 7 was adapted from Milyavskaya and Inzlicht (2017). Specifically, participants answered, "How much does having this secret . . ."/"How much does having this information unknown by others . . ." (a) " . . . conflict with your goal to connect with other people?" (b) " . . . conflict with your goal to be close to the people around you?" and (c) " . . . conflict with your goal to be social with others?" using response scales that ranged from 0 = *not at all* to 6 = *very much* (per Milyavskaya & Inzlicht, 2017; we transformed the response scale to range from 1 to 7 per our earlier measures).

Given that our theorizing proposes that thinking of secrets should produce feelings of fatigue—defined as a negative affective state arising from a motivational conflict (Hockey, 2013; Inzlicht & Schmeichel, 2012; Inzlicht, Schmeichel, & Macrae, 2014; Saunders & Inzlicht, 2016)—we sought to provide evidence that our mediator (motivational conflict, or social isolation as its proxy) predicts fatigue above and beyond other negative affective states. We thus measured and controlled for the NA subscales from the PANAS-X (Watson & Clark, 1999). The NA subscales from the PANAS-X are fear, hostility, guilt, and sadness. It is the last one, "sadness," that warrants particular scrutiny here. A close inspection of the items (lonely, alone, downhearted, blue, and sad) reveals that it could also easily be labeled "feelings of loneliness." One can be sad without being lonely (e.g., watching a sad movie with a partner). Given that items like "lonely" and "alone" converge on the same latent factor as "downhearted" and "sad," it is possible this subscale will problematically overlap with our mediators of interest (social isolation, feeling that a secret conflicts with one's goals to affiliate with others). As we report below, this concern was warranted, and this particular subscale was dropped in Experiment 7.

Results and Discussion

Word clouds depicting the most commonly used words in each condition are presented in Figure 4.

Mediator. Participants who recalled secrets reported greater social isolation (Experiment 6) and more intense motivational conflict with their affiliation goals (Experiment 7) than did participants who recalled significant undisclosed personal information that was not kept secret (Table 16).

Feelings of fatigue. In both Experiments 6 and 7, participants who recalled secrets reported feeling significantly more fatigued than did participants recalling undisclosed personal information that was not kept secret (Table 16).

Indirect effect. Before testing for the indirect effect, we tested for an order effect. We tested whether order (0 = fatigue measured first, 1 = fatigue measured second) interacted with the mediator to predict fatigue. There was no such interaction in Experiment 6, b = 0.05, SE = 0.07, 95% CI = [−0.09, 0.20], $t(336)$ = 0.70, p =.48, or Experiment 7, b = 0.07, SE = 0.08, 95% CI = [−0.09, 0.22], $t(323)$ = 0.82, p = .41, suggesting there was no order effect in either study.

We examined whether recalling secret, relative to undisclosed, information led to feelings of fatigue through increased feelings of social isolation (Experiment 6) or motivational conflict (Experiment 7). Bootstrapped mediation analyses (with 5,000 iterations; Hayes, 2009) found that recalling a secret increased feelings of fatigue through increased feelings of social isolation, M indirect effect = 0.3927, SE = 0.0767, 95% CI = [0.2566, 0.5552] in Experiment 6, and through increased motivational conflict with their affiliation goals, M indirect effect = 0.1383, SE = 0.0561, 95% CI = [0.0372, 0.2564] in Experiment 7.

Controls

Experiment 6. Table 17 presents the effects of secrecy on the control variables. Zero-order correlations of control variables (Table A6) are presented in the Appendix.

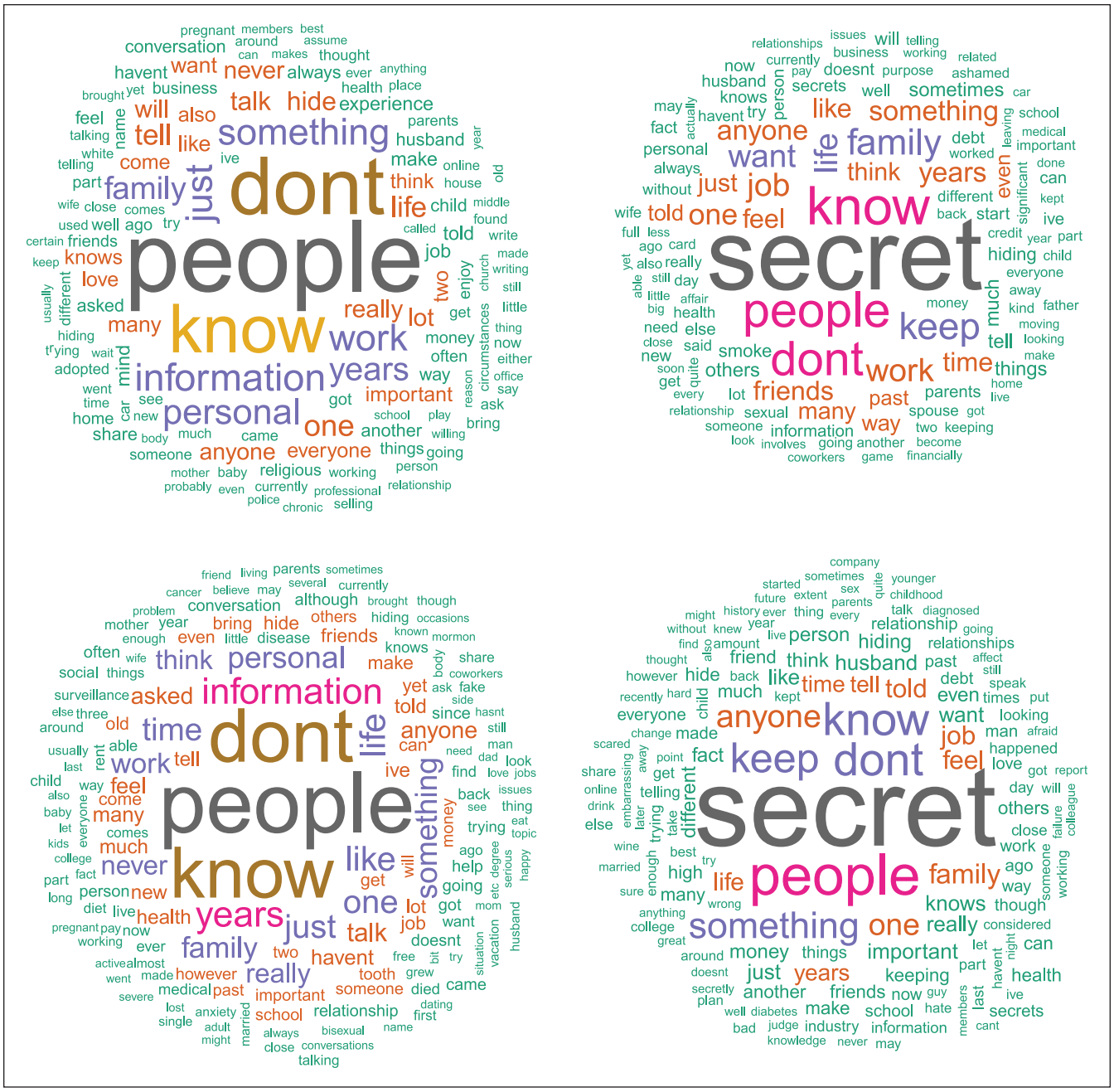

Figure 4. Word clouds generated from most frequent words used by participants in the undisclosed condition (left) and the secret condition (right), Experiment 6 (top) and Experiment 7 (bottom).

Secret information was associated with increased feelings of fear, hostility, guilt, and sadness, relative to private information that is not intentionally kept secret. Thus, indeed, secrets evoke a variety of other negative affective states. As previewed in the introduction to the present study, the "sadness" subscale of PANAS-X has potential problematic overlap with our social isolation mediator variable given that its items include "lonely" and "alone." Indeed this scale correlated with our measure of social isolation, $r = .80$, $p < .001$, and this presents multicollinearity problems when adding the sadness subscale as a control variable in the model (variance inflation factor = 7.96; see Kline, 1998). Given the ambiguous nature of any results in the context of multicollinearity, we exclude this variable from our analyses and dropped this subscale in Experiment 7. We report the inclusion of the "sadness" subscale in the Appendix (see also Table A9).

As can be seen in Table 18, independent of fear, guilt, and hostility, the isolation from recalling secrets predicted fatigue. The indirect effect of information condition on

Table 16. Effects of Secrecy on Social Isolation, Motivational Conflict, and Feelings of Fatigue (Experiments 6 and 7).

	Secret			Undisclosed			*t* test		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Experiment 6										
Social isolation	4.52	1.78	[4.25, 4.79]	3.05	1.71	[2.80, 3.31]	7.75	< .0001	0.84	[0.62, 1.06]
Fatigue	4.16	1.37	[3.95, 4.37]	3.62	1.34	[3.41, 3.82]	3.70	.0003	0.40	[0.19, 0.62]
Experiment 7										
Motivational conflict	3.20	1.88	[2.90, 3.50]	2.68	1.81	[2.41, 2.96]	2.53	.01	0.28	[0.19, 0.63]
Fatigue	4.15	1.42	[3.92, 4.37]	3.56	1.40	[3.35, 3.78]	3.74	.0002	0.41	[0.19, 0.63]

Note. Experiment 6 $df = 338$; Experiment 7 $df = 325$. CI = confidence interval.

Table 17. Fear, Hostility, Guilt, and Sadness by Condition (Experiment 6).

Control variable	Secret			Undisclosed			*t* test		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Fear[a]	2.17	1.16	[2.00, 2.35]	1.61	0.80	[1.49, 1.74]	5.14	<.0001	0.56	[0.34, 0.77]
Hostility[a]	2.08	1.13	[1.91, 2.26]	1.58	0.78	[1.46, 1.70]	4.77	<.0001	0.52	[0.30, 0.73]
Guilt[a]	2.44	1.25	[2.25, 2.63]	1.67	0.85	[1.54, 1.80]	6.64	<.0001	0.72	[0.50, 0.94]
Sadness[a]	2.72	1.32	[2.52, 2.92]	1.99	0.93	[1.85, 2.13]	5.84	<.0001	0.63	[0.42, 0.85]

Note. df = 298.90 (fear), 297.97 (hostility), 295.92 (guilt), and 300.82 (sadness). CI = confidence interval.
[a]Variances significantly differed, and thus a correction factor was used that did not alter statistical significance.

Table 18. Independent Effects on Fatigue in Experiment 6.

	Model 1			Model 2			Model 3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Isolation	0.27 (0.04) [0.19, 0.35]	6.73	<.0001				0.10 (0.04) [0.01, 0.18]	2.29	.02
Secrecy	0.15 (0.15) [−0.14, 0.45]	1.01	.31				−0.02 (0.14) [−0.29, 0.25]	−0.16	.87
Fear				−0.05 (0.09) [−0.23, 0.14]	−0.50	.62	−0.10 (0.10) [−0.29, 0.09]	−1.07	.28
Hostility				0.35 (0.12) [0.12, 0.57]	3.01	.007	0.31 (0.12) [0.08, 0.54]	2.70	.01
Guilt				0.44 (0.09) [0.26, 0.62]	4.73	.0001	0.42 (0.10) [0.23, 0.61]	4.40	<.0001

Note. CI = confidence interval.

Table 19. Fear, Hostility, and Guilt by Condition (Experiment 7).

Control variable	Secret			Undisclosed			*t* test		Effect size	
	M	*SD*	95% CI	*M*	*SD*	95% CI	*t*	*p*	*d*	95% CI
Fear	2.00	1.03	[1.83, 2.16]	1.75	1.01	[1.60, 1.90]	2.18	.03	0.24	[0.02, 0.46]
Hostility	1.83	1.00	[1.67, 1.99]	1.59	0.93	[1.45, 1.73]	2.27	.02	0.25	[0.03, 0.47]
Guilt[a]	2.27	1.28	[2.07, 2.47]	1.73	1.10	[1.57, 1.90]	4.06	.0001	0.45	[0.23, 0.67]

Note. df = 325 (fear, hostility) and 306.54 (guilt). CI = confidence interval.
[a]Variances significantly differed, and thus a correction factor was used that did not alter statistical significance.

Table 20. Independent Effects on Fatigue in Experiment 7.

	Model 1			Model 2			Model 3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Motivational conflict	0.27 (0.04) [0.19, 0.35]	6.75	<.0001				0.08 (0.04) [0.004, 0.16]	2.07	.04
Secrecy	0.44 (0.15) [0.15, 0.73]	3.01	.003				0.27 (0.13) [0.01, 0.53]	2.02	.04
Fear				0.28 (0.10) [0.08, 0.47]	2.73	.01	0.25 (0.10) [0.05, 0.45]	2.43	.02
Hostility				0.13 (0.13) [−0.12, 0.38]	1.03	.31	0.13 (0.13) [−0.12, 0.38]	1.05	.29
Guilt				0.39 (0.10) [0.20, 0.58]	4.06	.0001	0.33 (0.10) [0.13, 0.52]	3.33	.001

Note. CI = confidence interval.

feelings of fatigue through isolation was significant when including fear, guilt, and hostility controls, *M* indirect effect = 0.1437, *SE* = 0.0709, 95% CI = [0.0144, 0.2956].

Experiment 7. Table 19 presents the effects of secrecy on the control variables. Zero-order correlations of control variables (Table A7) are presented in the Appendix. Again, secrets were associated with stronger negative affective experiences.

When including the control variables, feelings of motivational conflict still predicted fatigue (Table 20).

Accordingly, the indirect effect of information condition on feelings of fatigue through motivational conflict was significant when including fear, guilt, and hostility controls, *M* indirect effect = 0.0429, *SE* = 0.0253, 95% CI = [0.0062, 0.1101]. Thus, the effects from the earlier studies replicate when measuring the motivational conflict engendered by secrecy more directly.

General Discussion

When the concept of secrecy comes to mind, people typically think of one aspect of it: concealment. The current research helps reveal, however, that there is far more to secrecy than the moments in which one actively conceals a secret during a conversation. Concealment of a secret is certainly not trivial; inhibition of speech during a conversation is cognitively depleting (Critcher & Ferguson, 2014). Yet, moments of concealment are temporally bounded. Secrets do not disappear when a concealment episode ends; they are still with us.

Defining secrecy as the commitment to conceal information from one or more people helps shed light on the broader phenomenon of secrecy. Recent work reveals two broad processes that follow from this commitment: actively concealing a secret within relevant social interactions (where secrecy research has traditionally focused), and what is a far more frequent experience: thinking about the secret outside of those social interactions. The frequency of thinking about secrets (outside of concealment contexts) more reliably predicted lower well-being than did the frequency of concealing within social interactions (Slepian et al., 2017; Slepian & Moulton-Tetlock, 2018). Building from this prior work, the present work is the first to experimentally examine the consequences of this common and important experience people have with secrecy.

The current work found that thinking about secrets, relative to significant personal information that is unknown by others (but without the intent to keep it secret), produces feelings of fatigue by making the motivational conflict inherent to the secret accessible. Put differently, thinking about one's secret reminds one that it conflicts with one's goals to connect with others and makes one feel alone with the secret information. We found consistent evidence for this indirect effect over and above a variety of statistical controls. In addition, in five of the six experiments on fatigue we observed a direct effect of secrecy on feelings of fatigue.

This pattern of findings is consistent with an affective model of fatigue, whereby reflecting on a secret can evoke a motivational conflict. The motivation to engage in an activity despite there being benefits to disengage from that very activity is experienced as subjectively fatiguing (Hockey, 2013; Inzlicht & Schmeichel, 2012; Inzlicht et al., 2014; Saunders & Inzlicht, 2016). The more one's goal to keep the secret conflicts with one's desire to connect with others and obtain their support, the more thinking of the secret was associated with feelings of fatigue. Disclosure is inherently rewarding (Tamir & Mitchell, 2012) and can promote social closeness (Altman & Taylor, 1973; Epley & Schroeder, 2014; Harber, Podolski, & Williams, 2015). However, disclosure can also stimulate disapproval (Coates, Wortman, & Abbey, 1979; Harber, Schneider, Everard, & Fisher, 2005; Lehman, Ellard, & Wortman, 1986). Secrecy creates a conflict between the goal to connect with others and the goal to keep the secret information unknown, which manifests in feelings of social isolation and motivational conflict.

The indirect relationship between thinking about personal secrets and feelings of fatigue emerged across a variety of content domains (Experiments 1-4, 6) and was manifested behaviorally in lower levels of task persistence and performance (solving anagrams, Experiment 5). These findings add to the body of work showcasing the negative effects of social isolation (influencing pain, attention, and perceptual judgments; Bernstein et al., 2008; Bernstein & Claypool, 2012; Pitts et al., 2014; Sacco, Wirth, Hugenberg, Chen, & Williams, 2011).

Implications for Social Connection and Identity Management

Sharing experiences with another person is a fundamental way to connect with them. Disclosing one's inner thoughts and feelings during social interactions is essential for strengthening and deepening the relationship, which explains why people find self-disclosure intrinsically rewarding (Tamir & Mitchell, 2012).

Disclosure is a central way to express oneself, to be known, and thus to connect with another. Keeping secrets thus undermines a fundamental way in which people connect with one another (Liu & Slepian, 2018). In the current work, we identified a motivational conflict between sharing information to connect and obtain social support from others and withholding information to avoid potential reputational or relational costs. This conflict is reminiscent of similar dilemmas found in related literatures on identity management and social exclusion, which we discuss in turn below.

Prior work in identity management has suggested that concealing an aspect of oneself from others creates a divide between the public and private self. For instance, concealing one's sexual orientation at work presents a public self that conflicts with one's private self. Prior work finds that the more people compartmentalize the self into two in this manner (consistent with the notion of multiple selves, for example, James, 1892; Mead, 1934), the more distress they experience (Sedlovskaya et al., 2013). Future research should examine to what extent such effects are driven by concealment within social interactions versus having to live with the motivational conflict inherent to having the secret.

The current findings point to a paradoxical vicious cycle whereby secrecy that is undertaken to avoid social exclusion actually results in enhanced feelings of (self-enforced) social isolation. The current work finds that by holding back significant information from others, individuals feel alone with that information and disconnected from others. These findings present a portrait of the secret-holder as internally conflicted, socially isolated, and fatigued. Future research may explore other outcomes that follow from secrecy-related feelings of social isolation. Researchers have shown that social exclusion makes people attentive to cues of acceptance and also rejection, more sensitive to pain and also more numb to it, and more prosocial and also more antisocial (see Bernstein & Claypool, 2012; Bernstein, Sacco, Brown, Young, & Claypool, 2010; Bernstein, Young, Sacco, Brown, & Claypool, 2008; Sacco et al., 2011). Future research should examine whether a similar divergence can be seen in the current context, whereby feelings of isolation from secrecy might lead people to seek out social connections to compensate for their self-imposed isolation, but also make them wary of getting too close to others for fear of being "found out," thus giving rise to maladaptive behavior in social interactions.

Open Questions and Future Directions

Across the seven present experiments, we implemented a range of statistical controls to account for possible differences between participants' secrets and information that others do not know (yet the participant does not intend to conceal). It is possible that despite the use of a variety of statistical controls, the experimental conditions still differed from the control conditions in other ways, aside from the critical difference in the intention to conceal the information. Yet, at some point, the attributes that characterize secret information, and fuel the desire to keep personal information unknown by others, are arguably part of the effect of secrecy. Future research should further seek to disentangle the attributes that are core to the experience of secrecy from those that merely co-vary with the experience of secrecy. The methods used in the current work may serve as a helpful starting point in this endeavor.

Future research may also explore boundary conditions for the effect of secrecy on feelings of fatigue observed in our studies. For example, future research may investigate whether thinking about secrets that are kept from close others, or from many people, results in greater feelings of fatigue compared with thinking about secrets that are kept from distant others, or from few people (but note that prompts that ask for certain "kinds" of secrets can produce contrast effects if worded too extremely; Slepian, Masicampo, & Galinsky, 2016). Future work can also explore whether different levels of preoccupation with a secret influence feelings of fatigue when thinking about the secret (see Slepian, Camp, & Masicampo, 2015).

In addition, future research may investigate the extent to which thinking about others' secrets, rather than one's own secrets, produces feelings of fatigue (see Slepian & Greenaway, 2018). People often confide their secrets in others (Slepian & Kirby, 2018; Slepian & Moulton-Tetlock, 2018). Future research could test whether thinking of a secret that has been confided in another person is less fatiguing then thinking of a secret that is kept entirely to oneself.

Finally, given that the harm from secrecy comes from having the secret on one's mind, future research may explore how different attributes of one's mind, such as one's working memory capacity (Klein & Boals, 2001) or ability to deal with unwanted thoughts (Cohen, Kim, & Hudson, 2014), affect secrecy's downstream consequences.

Taking the perspective of secrecy as the commitment to conceal information, future work could adapt the methodology employed in the current work to study secrecy's consequences in other domains. Secrecy has been rarely experimentally studied despite being ubiquitous and highly consequential. We suggest that the general paradigm used in the current work can help shed light on this sorely understudied phenomenon by finally making headway on utilizing experiments to examine the effects of people's real-world secrets.

Conclusion

Whereas prior work has examined how inhibiting speech in conversation may be fatiguing, the current work examined the consequences of thinking about information that one intentionally conceals from others, another defining feature of secrecy (Slepian et al., 2017). The present work presents the first experimental comparison of the consequences of thinking about personal real-world secrets relative to thinking about other significant personal information unknown by others. Thinking of one's secrecy serves as a reminder that the secret conflicts with one's social goals, highlights one's social isolation with regard to the secret, and results in an unpleasant subjective experience of fatigue. Thus, secrecy—the commitment to conceal information from others—can be fatiguing even during moments when one is not engaging in active concealment.

Appendix

A Magic Eye Puzzle: Multicollinear Noise or Isolation Without Loneliness? (Experiment 6)

Readers may recall the Magic Eye Puzzles of the 1990s, which present an image that appears to be mere visual noise, but if viewed at just the right angle, a hidden image will appear. Such images may not always come to the persistent viewer, and it can feel like one is going cross-eyed looking for the meaning in the noise. In a similar vein, we present here a set of analyses that are ambiguous as to their meaning. Recall that in Experiment 6 we measured all negative affect (NA) subscales from the PANAS-X: fear, guilt, hostility, and sadness. The "sadness" subscale correlated $r = .80$ with our mediator. This high correlation causes some concern regarding multicollinearity (i.e., the variance inflation factor for this predictor = 7.96). Seen from far back, any effects in such an analysis may have little meaning, simply noise not to be interpreted nor read into. Or, if one wishes to cross their eyes, meaning may emerge. We report the results here, including the "sadness" subscale, and leave this choice to the reader.

First a reminder of the potential problem: The items in the "sadness" subscale are lonely, alone, downhearted, blue, sad. The authors of the PANAS-X label this subscale "sadness," but a close inspection of the items reveals that it could easily also be labeled "loneliness." One can be sad without being lonely (e.g., watching a sad movie with a partner), which raises the question of why "lonely" and "alone" are included in a general sadness measure. Our answer: The latent factor captured by these items is "feelings of loneliness," which problematically overlaps with Experiment 6's mediator of interest, feelings of social isolation.

Intriguingly, the sign of the relationship between social isolation and fatigue reverses when including "sadness"/"feelings of loneliness" and is significant in the other direction (more isolation predicting less fatigue; compare the models in Table A9). Now, this may have no meaning given the high correlation between "sadness"/"feelings of loneliness" and social isolation, and the high variance inflation factor prompting multicollinearity concerns. If one sought to interpret this all the same, the question to ask is, "What does an increase in social isolation mean when holding constant feelings of loneliness?"

One interpretation of an increase in isolation (without a corresponding increase in loneliness) is that it represents a healthier experience of solitude. Indeed, solitude in certain contexts is evaluated positively (e.g., separating oneself from others and maintaining independence is a healthy aspect of identity formation, both in adolescence and in adult relationships; Larson, 1997; Slotter, Duffy, & Gardner, 2014).

It might seem strange to the reader that one would want to control for such closely related constructs, and we are inclined to agree. Hence, we urge caution in interpreting the findings that include the "sadness"/"feelings of loneliness" subscale as a control—despite the theoretical possibility that, holding constant feelings of loneliness, an increment in solitude would mean a more positive experience of solitude, which would explain why it was then associated with reduced feelings of fatigue. Is the relationship merely a noisy image, not to be interpreted in the context of multicollinearity, or does the hidden image that emerge when accounting for loneliness warrant a longer look? We leave it for the reader to decide.

Table A1. Zero-Order Correlations From Measured Variables in Experiment 1.

	Isolation	Fatigue	Valence
Fatigue	.47**		
Valence	−.27**	−.66**	
Importance	.20**	.01	.06

**$p < .01$.

Table A2. Zero-Order Correlations From Measured Variables in Experiment 2.

	Isolation	Fatigue	Valence	Importance	Shame
Fatigue	.26**				
Valence	−.15	−.41**			
Importance	.30**	.13	−.18*		
Shame	.38**	.30**	−.46**	.30**	
Guilt	.52**	.28**	−.39**	.29**	.75**

*$p < .05$. **$p < .01$.

Table A3. Zero-Order Correlations From Measured Variables in Experiment 3.

	Isolation	Fatigue	Valence	Importance	Embarrassment
Fatigue	.24**				
Valence	−.28**	−.39**			
Importance	−.03	−.26**	.24**		
Embarrassment	.44**	.30**	−.31**	−.07	
Excitement	−.13	−.61**	.47**	.39**	−.26**

**$p < .01$.

Table A4. Zero-Order Correlations From Measured Variables in Experiment 4.

	Isolation	Fatigue	Valence	Import	Embarrass	Shame	Excite	Think	Suppress
Fatigue	.39**								
Valence	−.41**	−.55**							
Importance	.25**	−.01	−.17*						
Embarrass	.40**	.53**	−.67**	.19**					
Shame	.44**	.50**	−.70**	.23**	.86**				
Excitement	−.18*	−.59**	.67**	.08	−.46**	−.45**			
Process	.40**	.21**	−.24**	.28**	.25**	.23**	−.09		
Suppress	.36**	.38**	−.49**	.19**	.43**	.44**	−.43**	.24**	
Distract	.61**	.36**	−.39**	.40**	.45**	.44**	−.14	.47**	.38**

Note. Process = motivation to think and process the personal information; Suppress = motivation to suppress thoughts of the personal information.
*$p < .05$. **$p < .01$.

Table A5. Zero-Order Correlations From Measured Variables in Experiment 5.

	Isolation	Persistence	Performance	Valence
Persistence	−.19**			
Performance	−.15*	.55**		
Valence	−.17*	−.02	−.08	
Importance	.37**	.01	−.03	−.07

*$p < .05$. **$p < .01$.

Table A6. Zero-Order Correlations From Measured Variables in Experiment 6.

	Isolation	Fatigue	Fear	Hostility	Guilt
Fatigue	.39**				
Fear	.56**	.40**			
Hostility	.54**	.51**	.74**		
Guilt	.52**	.54**	.68**	.79**	
Sadness	.80**	.58**	.74**	.82**	.77**

**$p < .01$.

Table A7. Zero-Order Correlations From Measured Variables in Experiment 7.

	Conflict	Fatigue	Fear	Hostility
Fatigue	.37**			
Fear	.46**	.51**		
Hostility	.45**	.51**	.75**	
Guilt	.46**	.55**	.73**	.81**

Conflict = motivational conflict
**$p < .01$.

Table A8. Experiment 5 Indirect Effects of Persistence and Performance (With Outlying Outcomes Included).

	IE	*SE*	95% CI
No controls			
Secret → Isolation → Persistence	−0.8161	0.6370	[–2.1749, 0.3291]
Secret → Isolation → Performance	−2.0575	1.2076	[–4.7260, −0.0176]
Secret → Isolation → Persistence → Performance	−0.9233	0.7247	[–2.3811, 0.4970]
With controls			
Secret → Isolation → Persistence	−1.1190	0.6422	[–2.6808, −0.0607]
Secret → Isolation → Performance	−2.3569	1.3152	[–5.2297, −0.1839]
Secret → Isolation → Persistence → Performance	−0.4501	0.2699	[–1.1021, −0.0288]

Note. IE = indirect effect; CI = confidence interval.

Table A9. Independent Effects on Fatigue in Experiment 6, comparing main-text models (A) to models with "sadness" (B; see Appendix).

	Model A1			Model A2			Model A3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Isolation	0.27 (0.04) [0.19, 0.35]	6.73	<.0001				0.10 (0.04) [0.01, 0.18]	2.29	.02
Secrecy	0.15 (0.15) [−0.14, 0.45]	1.01	.31				−0.02 (0.14) [−0.29, 0.25]	−0.16	.87
Fear				−0.05 (0.09) [−0.23, 0.14]	−0.50	.62	−0.10 (0.10) [−0.29, 0.09]	−1.07	.28
Hostility				0.35 (0.12) [0.12, 0.57]	3.01	.007	0.31 (0.12) [0.08, 0.54]	2.70	.01
Guilt				0.44 (0.09) [0.26, 0.62]	4.73	.0001	0.42 (0.10) [0.23, 0.61]	4.40	<.0001
	Model B1			Model B2			Model B3		
Predictor	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*	*b* (*SE*) [95% CI]	*t*	*p*
Isolation	0.27 (0.04) [0.19, 0.35]	6.73	<.0001				−0.13 (0.06) [−0.25, −0.02]	−2.24	.03
Secrecy	0.15 (0.15) [−0.14, 0.45]	1.01	.31				0.10 (0.13) [−.016, 0.37]	0.74	.46
Fear				−0.19 (0.09) [−0.37, −0.002]	−1.99	.05	−0.17 (0.09) [−0.35, 0.01]	−1.85	.07
Hostility				0.08 (0.12) [−0.16, 0.32]	0.63	.53	0.01 (0.13) [−0.24, 0.26]	0.08	.94
Guilt				0.28 (0.09) [0.10, 0.47]	3.02	.003	0.24 (0.10) [0.04, 0.43]	2.41	.02
Sadness				0.53 (0.10) [0.34, 0.72]	5.43	<.0001	0.76 (0.14) [0.48, 1.04]	5.37	<.0001

Note. In Model B3, there is some concern regarding the sadness subscale which captures aspects of loneliness and correlates with social isolation at $r = .80$, and the variance inflation factor = 7.96 for sadness predictor. Any conclusions suggested from these models should be considered tentative. CI = confidence interval.

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Notes

1. If a participant does not submit their code for some reason, this allows additional participants to take the study. Or, additional participants can take part when a study is reposted. In the current work, we analyze all participants' data except for a priori exclusion criteria described above.

Supplemental Material

Supplemental material is available online with this article.

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