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Relieving the Burdens of Secrecy: Revealing Secrets Influences Judgments of Hill Slant and Distance

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Abstract

Recent work demonstrates that harboring secrets influences perceptual judgments and actions. Individuals carrying secrets make judgments consistent with the experience of being weighed down, such as judging a hill as steeper and judging distances to be farther. In the present article, two studies examined whether revealing a secret would relieve the burden of secrecy. Relative to a control condition, thinking about a secret led to the judgments of increased hill slant, whereas revealing a secret eliminated that effect (Study 1). Additionally, relative to a control condition, thinking about a secret led to judgments of increased distance, and again, revealing a secret eliminated that effect (Study 2). Sharing secrets with others might relieve the perceived physical burden from secrecy.

Keywords

secrecy, embodiment, metaphor, perception

Having a personal secret is common. Estimates for the prevalence of secrecy range from 32% to 99% (Frijns & Finkenauer, 2009; Vangelisti, 1994), and keeping a major secret has been linked with negative health consequences (Cole, Kemeny, Taylor, Visscher, & Fahey, 1996; Rodriguez & Kelly, 2006). Secrets are often kept to prevent shame or embarrassment (Maas, Wismeijer, van Assen, & Aquarius, 2011). Indeed, the most common secrets include events or self-attributes that can evoke disapproval, such as infidelity, abortion, and sexual orientation (Piazza & Bering, 2010; Vrij, Nunkoosing, Paterson, Oosterwegel, & Soukara, 2002).

Two cognitive models propose why keeping secrets is harmful. The preoccupation model (Lane & Wegner, 1995), based upon Wegner's (1994) model of ironic processes of thought control, suggests that suppressing thoughts of one's secret actually increases thoughts about that secret. This prompts increased suppression efforts and leads ultimately to a vicious cycle that could result in psychopathology. The second model, the inhibition model (Pennebaker, 1989), similarly proposes that inhibiting traumas and events is cognitively demanding. This inhibition acts as a minor stressor in the short term, but in the long term acts as a cumulative stressor, resulting in negative health outcomes (Pennebaker, 1989). In contrast, writing about life events or personal traumas helps individuals gain insights about them, with benefits for physical and psychological health (Pennebaker, 1989, 1993; Smyth, 1998).

Based upon recent work in embodied cognition, Slepian, Masicampo, Toosi, and Ambady (2012) proposed an additional mechanism for the negative consequences of secrecy. In contrast to models focusing on the cognitive burden of secrets, they proposed and found that keeping secrets might serve as a physical burden as well. When people are physically burdened, physical actions are judged to require more effort (Proffitt, 2006). Consequently, when people are physically burdened, perceptual judgments are adaptively biased to regulate action. The simple act of putting on a heavy backpack (a physical burden) can cause hills to be judged as steeper (Bhalla & Proffitt, 1999) and landmarks to be judged as farther away (Proffitt, Stefanucci, Banton, & Epstein, 2003). These shifts in representations of physical space help people regulate their actions in a cost-effective manner: A person judges a hill as steep, for instance, and is therefore discouraged from the costly act of scaling it (Proffitt, 2006).

Secrets are metaphorically conceived of as physical burdens, and therefore sensations associated with physical burden might be experienced when keeping secrets. Indeed, across several studies (Slepian, Masicampo, Toosi, & Ambady, 2012), participants carrying secrets demonstrated judgments and actions seen typically among people who are weighed down. Bearing secrets caused physical tasks to seem more

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effortful, hills to be judged as steeper, and distances to be judged as farther. Furthermore, the more burdensome the secret, the more participants judged physical, but not nonphysical tasks, as effortful. Keeping a secret seems to make people feel physically burdened. If bearing a secret weighs one down, perhaps that burden can be relieved by revealing the secret. The goal of the current work was to examine whether revealing a secret would unburden participants from that secret. Such a finding would provide extensions to work on secrecy, embodied metaphor, and the role of social interactions in coping with perceived burdens, each of which we discuss below.

Study 1

Carrying a secret, like carrying something heavy, leads hills to be judged as steeper (Slepian et al., 2012). We tested the effects of recalling and revealing secrets on judgments of hill slant, relative to a control condition (where no mention was made of secrets). We hypothesized that recalling secrets would lead to steeper judgments than the control condition, but that revealing a secret would reduce the experience of that burden, thereby leading participants who reveal secrets to judge hills as less steep than those recalling secrets, but similar to those in the control condition (i.e., returning them to a neutral baseline).

Method

Eighty-three online participants ($M_{age} = 31$; 55% female) were randomly assigned to one of the three conditions. In two of the conditions, participants completed two ostensibly different studies. The first study concerned secrets. Participants were randomly assigned to recall or reveal a secret. In the *recall condition*, participants responded to the prompt, ''Without revealing specific details about your big secret, we are curious what it pertains to. Please write about your big secret in the provided box, revealing as much or as little detail as you'd like'' (Slepian et al., 2012). This encouraged participants to recall secrets without revealing them. The *reveal condition* asked participants to respond to the prompt, ''Once you have your big secret in mind, we ask you to reveal this secret to us. Please write about your big secret in the provided box. Tell us your secret.'' This encouraged participants to be revealing. Subsequently, in the ostensibly separate second study, participants provided numerical estimations on control items (sturdiness of a table, durability of a water bottle, and temperature from an image of a park) and the critical dependent measure, estimating the steepness of a pictured hill. As in prior work (Proffitt, Bhalla, Gossweiler, & Midgett, 1995), participants viewed a grassy hill face on and provided a numerical estimation of slant in degrees.[1] In the third *control condition*, no mention of secrets was made prior to the judgments.[2] We predicted that recalling a secret would lead to steeper estimates of hill slant relative to control, but that revealing a secret would eliminate this effect.

Results and Discussion

Manipulation Check

We first examined whether secrets differed in importance and how revealing they were (because possibly participants chose less important and burdensome secrets to share in the reveal condition). Two independent raters, blind to hypotheses and conditions, rated the secrets, presented randomly, on how revealing they were from 1 (*not at all revealing*) to 7 (*very revealing*) and how important they were from 1 (*not at all important*) to 7 (*very important*). Ratings were reliable ($\alpha_{importance} = .87$; $\alpha_{revealing} = .76$). A 2 (condition: recall secret, reveal secret) × 2 (rating: importance, revealing) mixed-model analysis of variance (ANOVA) with repeated measures on the second factor revealed no main effects of condition, $F(1, 35) = 0.41$, $p = .53$, or rating, $F(1, 35) = 0.38$, $p = .54$, but showed the predicted interaction, $F(1, 35) = 7.35$, $p = .01$, $\eta^2 = .17$. Planned contrasts demonstrated that secrets revealed were more revealing ($M = 4.79$, SD = 1.68) than secrets recalled ($M = 3.77$, $SD = 2.00$), $t(35) = 3.03$, $p = .005$, $r = .46$, but secrets revealed were not less important ($M = 4.00$, $SD = 1.91$) than secrets recalled ($M = 4.27$, $SD = 1.81$), $t(35) = 0.80$, $p = .43$. Thus, the secrets participants selected across the two conditions did not differ in importance; they only differed in terms of how much participants revealed about those secrets.

Main Analyses

We next examined the effect of revealing and recalling secrets, relative to the control condition, on judgments. The four dependent measures (three control items and hill slant) were standardized and the three control items were averaged to create an index of control numerical estimation. For ease of interpretation, untransformed slant estimates are presented in the text (see Figure 1 for standardized means). A 3 (condition: recall secret, reveal secret, control) × 2 (estimation type: hill slant, control estimates) mixed-model ANOVA with repeated measures on the second factor revealed a marginal effect of condition, $F(2, 57) = 2.90$, $p = .06$, and no effect of estimation type, $F(2, 57) = 0.42$, $p = .52$, but this was qualified by the predicted interaction, $F(2, 57) = 4.18$, $p = .02$, $\eta^2 = .13$. Two ANOVAs examined the nature of the interaction. There were no differences across conditions for numerical estimation magnitude, $F(2, 57) = 2.42$, $p = .10$, whereas there were differences across conditions for hill slant estimation, $F(2, 57) = 3.97$, $p = .02$, $\eta^2 = .12$. Planned contrasts demonstrated that participants who recalled a secret judged the hill as steeper ($M = 55.36$, $SD = 19.31$) than both participants who revealed a secret ($M = 42.04$, $SD = 14.24$), $t(57) = 2.33$, $p = .02$, $r = .29$, and those in the control condition ($M = 40.00$, $SD = 17.64$), $t(57) = 2.69$, $p = .009$, $r = .34$; the latter two conditions did not differ significantly, $t(57) = 0.41$, $p = .68$.[3] These results are consistent with the prediction that harboring secrets increases the experience of physical burden and that revealing secrets reduces the experience of that burden.

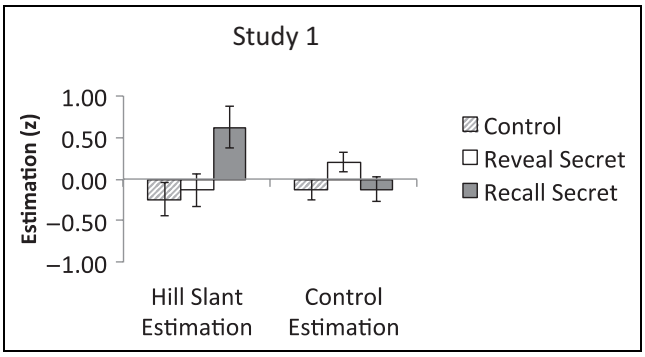

Figure 1. Estimated hill slant and control numerical estimate magnitude as a function of condition. Error bars denote standard error of the mean.

Study 2

In Study 1, recalling a secret increased estimates of hill slant, relative to a control condition. Revealing a secret led to slant estimates no different from control, suggesting that the burden of a secret can be lifted by revealing it.

Study 2 was similar to Study 1 but with two changes. First, rather than measure judgments of hill slant, we measured judgments of distance (which also vary by physical burden; Proffitt et al., 2003; Witt, Proffitt, & Epstein, 2004). This allowed us to test the effects of revealing secrets in a new domain. Second, while the results of Study 1 are consistent with our *secrets-as-burdens* hypothesis, we also anticipated an alternative explanation for such results. We refer to it as the *thoughts-as-burdens* hypothesis. According to this alternative hypothesis, participants in Study 1 were burdened because their minds were fully occupied by thoughts of their secrets. From this perspective, holding a secret is burdensome because it occupies a person's mind, not because a secret has other qualities that are burdensome. The *thoughts-as-burdens* hypothesis makes an easily testable prediction, which is that a high cognitive load should also be burdensome, because both cognitive loads and secrets occupy one's thoughts. A cognitive load, like a secret, may make people feel burdened and tired. Prior work demonstrates that actual physical burden increases distance estimates (Proffitt et al., 2003; Witt et al., 2004). In Study 2, we therefore tested whether a cognitive load and a secret would both increase distance estimates.

The *thoughts-as-burdens* hypothesis predicts that secrets are burdens because they occupy the mind. We tested this hypothesis against our proposed *secrets-as-burdens* hypothesis, which states that holding a secret is burdensome not simply because it occupies one's thoughts but because the secret bears one down and because the secret is held without the support of others. The *secrets-as-burdens* hypothesis stresses that the meaning of one's thoughts is critical.

The *secrets-as-burdens* hypothesis predicts that a standard cognitive load (e.g., a nine-digit number), despite fully occupying one's thoughts, will not be burdensome because it is not the kind of information metaphorically conceived of as a physical burden; a cognitive load is not seen as having weight that one must carry alone. Therefore, in the present study, we predicted that a cognitive load would not produce the same effect as holding a secret. Rather, we predicted that a cognitive load would produce distance estimates that were no different than those made by participants in the control condition, because it does not involve the carrying of burdensome information without the support of others.

As in Study 1, participants recalled a secret, revealed a secret, or did not think of a secret (control). A fourth condition assigned a high cognitive load. The *thoughts-as-burdens* hypothesis predicts that both the cognitive load and the recalling secrets conditions will produce greater distance estimates than a control condition because participants in both conditions will have occupied minds. In addition, it predicts that the revealing secrets condition will produce estimates similar to the control condition because participants' minds will no longer be so occupied (see Sparrow & Wegner, 2006).

On the other hand, the *secrets-as-burdens* hypothesis predicts that the cognitive load and revealing secrets conditions will produce distance estimates similar to the control condition, while *only* the recalling secrets condition will produce relatively high distance estimates as this is the only condition in which participants will be carrying weighty secrets on their own.

Method

One hundred and seventy-four participants ($M_{age} = 30$; 51% female) recruited online were randomly assigned to one of the three conditions (*recall*, *reveal*, and *control*) from Study 1 or a fourth *cognitive load* condition. The fourth condition asked participants to keep a nine-digit number in memory for the duration of the study (e.g., Gilbert & Hixon, 1991; Sherman, Lee, Bessenoff, & Frost, 1998; Wegner, Erber, & Zanakos, 1993). Subsequently, all participants provided the same control estimations as in Study 1, but rather than estimating hill slant, participants viewed eight images of houses seen across lawns of various sizes, and estimated the distance to each randomly ordered house in feet. Subsequently, as a manipulation check, those in the cognitive load condition were asked to report the number that they were given in the beginning of the study, and were also asked if they had written the number down rather than memorize it.[4] We predicted that recalling a secret would lead to larger estimates of distance, relative to the remaining conditions.

Results and Discussion

Manipulation Check

As in Study 1, secrets were rated on how revealing and important they were by judges blind to hypotheses and conditions ($\alpha_{importance} = .78$; $\alpha_{revealing} = .71$). A 2 (condition: recall secret, reveal secret) × 2 (rating: importance, revealing) mixed-model ANOVA with repeated measures on the second factor revealed no effect of rating, $F(1, 50) = 0.51$, $p = .48$, and a main effect

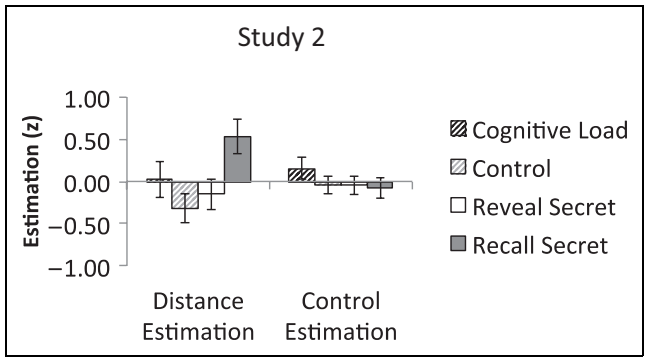

Figure 2. Estimated distance and control numerical estimate magnitude as a function of condition. Error bars denote standard error of the mean.

of condition, $F(1, 50) = 4.09$, $p = .05$, $\eta^2 = .08$. This was qualified, however, by the predicted interaction, $F(1, 50) = 13.13$, $p = .001$, $\eta^2 = .21$. Planned contrasts demonstrated that secrets revealed were more revealing ($M = 4.90$, $SD = 1.26$) than secrets recalled ($M = 3.35$, $SD = 1.55$), $t(50) = 4.86$, $p < .001$, $r = .57$, but secrets revealed were not less important ($M = 4.24$, $SD = 1.61$) than secrets recalled ($M = 4.33$, $SD = 1.70$), $t(50) = 0.27$, $p = .79$. Thus, as in Study 1, the secrets participants shared or thought about did not differ in importance, but only how much participants revealed about them.

Main Analyses

We next examined the effects of revealing and recalling secrets, relative to the cognitive load and control conditions, on judgments. First, because there was no upper limit for estimated distance, distance estimates were nonnormal (Shapiro–Wilk's $W = .71$, $p < .001$). We corrected for skew by taking the natural logarithm of distance estimates (Shapiro–Wilk's $W = .98$, $p = .08$). The four dependent measures (three control items and distance judgments) were then standardized and the three control items were averaged to create an index of control numerical estimation. For ease of interpretation, untransformed distance estimates are presented in the text (see Figure 2 for standardized means). A 4 (condition: recall secret, reveal secret, control, cognitive load) × 2 (estimation type: distance, control estimates) mixed-model ANOVA with repeated measures on the second factor revealed a marginal effect of condition, $F(3, 99) = 2.55$, $p = .06$, and no effect of estimation type, $F(3, 99) = 0.05$, $p = .82$, but these effects were qualified by a significant interaction, $F(3, 99) = 3.13$, $p = .03$, $\eta^2 = .09$. Two ANOVAs examined the nature of the interaction. There were no differences across conditions for control numerical estimation magnitude, $F(3, 99) = 0.73$, $p = .54$, whereas there were differences across conditions for distance estimation, $F(3, 99) = 3.60$, $p = .02$, $\eta^2 = .11$. Planned contrasts revealed that participants who recalled a secret judged distances as farther ($M = 306.94$ ft, $SD = 266.46$) than participants who revealed a secret ($M = 170.89$ ft, $SD = 145.25$), $t(99) = 2.49$, $p = .01$, $r = .24$, those in the control condition ($M = 170.59$ ft, $SD = 163.98$), $t(99) = 3.17$, $p = .002$, $r = .30$, and marginally more than those in the cognitive load condition ($M = 185.15$ ft, $SD = 113.46$), $t(99) = 1.74$, $p = .085$, $r = .17$; the latter three conditions did not differ, ts < 1.23, ps > .22.

Recalling secrets led to larger estimates of distance than did revealing secrets and not thinking of secrets (the control condition). These effects were specific to judgments of physical space, as there was no difference for other judgments. This pattern of results parallels that found in Study 1 with slant estimates. Recalling a secret leads to judgments indicating burden, but revealing secrets does not. Revealing a secret seems to return participants to a baseline, bringing estimates of physical space in line with participants who did not consider secrets at all.

Distance judgments made under cognitive load did not differ from those made in the revealing secrets and control conditions. Furthermore, a cognitive load did not produce effects similar to those seen from recalling secrets, given that recalling secrets led to distance estimates that were significantly larger than those made by control participants, whereas there was no difference between control and cognitive load distance estimates. Additionally, judgments of distance made after recalling secrets were marginally larger than those made when under cognitive load.

One tentative interpretation of these results is that they offer more support for the *secrets-as-burdens* hypothesis than for the *thoughts-as-burdens* hypothesis. This interpretation is supported by the finding that recalling secrets leads to somewhat larger estimates of distance than does a cognitive load. Although the two-tailed test of this directional hypothesis did not reach the traditional level of significance, a one-tailed test would. Still, one could argue that this difference was not significant and therefore that the cognitive load and recalling secrets conditions are not demonstrably different. Indeed, the mean distance estimate of the cognitive load condition fell between the mean estimates of the control and recalling secrets groups. This may suggest that the difference between a cognitive load and recalling a secret is one of magnitude and not type. Stated differently, recalling a secret may have induced a much larger cognitive load than was induced in the cognitive load condition. There is reason to doubt such an explanation, however. In the cognitive load condition, participants were asked to rehearse a nine-digit number, which is a task that already pushes at the upper limit of people's cognitive capacity (Miller, 1956). In contrast, recalling a secret seems less demanding. Recalling secrets in this study required only that participants respond to a prompt and then move on. Participants were not required to continually think about their secrets. Thus, it seems doubtful that recalling secrets induced an even greater cognitive load than was induced by having participants continually rehearse nine digits. These results are consistent with the *secrets-as-burdens* hypothesis in suggesting that recalling a secret produced the observed effect on distance judgments due to factors beyond simply occupying participants' thoughts. But given that recalling secrets led only to marginally larger distance estimates than the cognitive load condition, this particular conclusion must be made with some caution.

General Discussion

In Study 1, participants revealed their secret, thought about their secret, or were not prompted to think of secrets at all. Recalling a secret led participants to judge a hill as steeper, whereas those who revealed their secret had similar estimations of hill slant as those not reminded about secrets at all. Revealing a secret therefore seemed to unburden participants: Those who were explicitly asked to reveal their secret in Study 1 did not demonstrate the apparent physical burden that those who recalled secrets did. Study 2 replicated these results using a different measure that varies by physical burden—estimated distance.

One possibility is that those who revealed secrets chose less important secrets to reveal, and these were therefore less weighty (as importance has been linked to experienced weight; see Jostmann, Lakens, & Schubert, 2009; Schneider, Rutjens, Jostmann, & Lakens, 2011). The data, however, did not support this. Revealers chose secrets that were rated as equally important as the secrets from participants who merely recalled secrets. Critically, in both studies, the effects were specific to judgments of physical space only, and not to numerical judgments more generally, specifically implicating the experience of physical burden, rather than a mere cognitive load, which would not influence physical judgments specifically.

Previous work demonstrates that people conceptualize secrets metaphorically as physical burdens, and that recalling meaningful secrets can lead to outcomes indicative of physical burden (Slepian et al., 2012). In the current work, we demonstrated that revealing those secrets can lift that burden. Revealing a secret led participants to behave in ways similar to participants who were not thinking of secrets at all.

Implications for Secrecy

Previous models have focused on the cognitive burdens of secrecy. The inhibition model (Pennebaker, 1989) proposes that negative consequences of secrecy stem from active inhibition. This inhibition has two negative outcomes. First, the inhibitive act itself is demanding and serves as a stressor. Second, inhibition prevents an insightful understanding of the secret. Thus, one possible mechanism for the physical relief experienced from revealing a personal secret is gaining some insight into the event.

While the inhibition model (Pennebaker, 1989) suggests potential mechanisms for the relief experienced from revealing secrets, the preoccupation model of secrecy (Lane & Wegner, 1995) suggests possible mechanisms for the burden experienced from harboring secrets. That model suggests that attempts to conceal or suppress a secret can ironically enhance thoughts about that secret. Those intrusive thoughts can trigger further suppression efforts, creating a vicious cycle. The push and pull of suppression attempts and ironic thoughts resembles the *secrets are physical burdens* metaphor. Secrets are seen as being carried around alone by the secret bearer and weighing that person down. The weight of a secret seems to involve a metaphor for moving around in daily life without revealing that secret. Such a process bears a resemblance to thought suppression and its ironic result—rumination (Gold & Wegner, 1995). This notion points to a potential distinction between a standard cognitive load and the apparent physical burden imposed by secrets. In Study 2, a cognitive load did not alter distance judgments as much as recalling a secret did, even though the cognitive load was designed to fully consume participants' working memory (Miller, 1956). Some key features of burdensome secrets (beyond possible cognitive load) are that they are carried alone and can be important, intrusive, and often unwelcome. It may be this type of information, which people often ruminate about (Martin & Tesser, 1989), that is physically burdensome.

Future work on the physical burdens of secrecy could borrow techniques from the literature on thought suppression and rumination. Perhaps the effects of recalling secrets on perceptual judgments are strongest for those who tend to ruminate (see Wegner & Zanakos, 1994). Additionally, perhaps it is the cycle of intrusive thoughts promoting suppression attempts that contributes to the burdens of secrecy. Many methods from the thought suppression literature can help test these hypotheses, for example, by manipulating the context in which secrecy and revealing occur and examining attributions made for unwanted thoughts (Förster & Liberman, 2001; Liberman & Förster, 2000; Slepian, Oikawa, & Smyth, in press; Wegner, Schneider, Knutson, & McMahon, 1991).

Implications for Embodied Cognition

Most work in embodied cognition within social psychology has manipulated temporary physical states and examined subsequent influences on cognition, to test whether a particular metaphor is partly embodied (e.g., IJzerman & Semin, 2009; Lee & Schwarz, 2010; Slepian, Rule, & Ambady, 2012; Williams & Bargh, 2008; Zhong & Liljenquist, 2006; for a review, see Meier, Schnall, Schwarz, & Bargh, 2012). In contrast, the current work examined secrets, which are held for long, and their influence upon embodied outcomes.

The current work also reveals how social interactions affect coping with perceived burdens. Recent work has concluded that close, enduring, and supportive relationships buffer against the effects of physical burdens on perceptual judgments (Schnall, Harber, Stefanucci, & Proffitt, 2008). While the present work is quite different from that work—it observes the effects of metaphorical rather than physical burdens and does not observe close social relationships—the present work offers interesting extensions. It suggests that even metaphorical burdens can be relieved through social means. Additionally, it suggests that even brief interactions with distant others can offer relief from physical burdens. In our studies, participants revealed their secrets to complete strangers—not close and supportive friends. Perhaps then, social networks can be used to relieve burdens in ways that do not require close support. Future work may examine more closely how various social interactions (e.g., transactive processes and delegation of tasks) influence experiences of burdens and perceptual judgments.

The Costs and Benefits of Secrecy

Revealing secrets can bring positive effects. Recent work suggests that sharing personal information with another who is accepting can have positive consequences for health (see Rodriguez & Kelly, 2006). Additionally, by sharing a secret with another, one is able to attain greater insight into that event, and this can contribute to improvements in physical and mental health (see Pennebaker, 1989, 1993; Smyth, 1998).

Yet, keeping a secret can also shield individuals from shame and embarrassment. In some cases, revealing a secret to the wrong person could be harmful. One study found that keeping a major secret from others predicted *lower* distress (Kelly & Yip, 2006), demonstrating a benefit of concealment. Thus, in some cases, keeping a secret might be preferred over revealing it, in order to avoid shame and disapproval.

Perhaps revealing a secret anonymously can allow one to avoid disapproval from others while still being relieved from perceived physical burden. The popularity of PostSecret, an online project that encourages people to share secrets anonymously, suggests perhaps that disclosing secrets in this fashion can relieve the physical burdens of secrecy; many express great relief to reveal a secret in this way (Warren, 2006). Future work should compare the benefits of revealing a secret to a close other to revealing a secret to someone less close, or to no particular person at all (e.g., anonymously).

Conclusion

In sum, secrets can be burdensome, affecting how people see and act on the world, with potential negative consequences for physical and mental health Previous work reveals potential remedies. Writing about difficult life experiences allows one to rethink them in helpful ways (Lepore & Smyth, 2002; Pennebaker, 1997), and writing about a secret while imagining an accepting confidant can help by increasing feelings of acceptance (Rodriguez & Kelly, 2006). The present work found that sharing secrets with others might further benefit individuals, by relieving the burden from secrets.

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Notes

1. We are specifically interested in relative differences in representations of physical space, not accurate perceptions. In fact, when providing verbal estimates of hill slant, people vastly overestimate. When participants viewed hills face on, a 10° hill was judged on average to be 31°, a 34° hill was judged as 55° (Proffitt et al., 1995), and a 45° hill was judged approximately to be 65° (Proffitt, Creem, & Zosh, 2001). We therefore expected all participants to overestimate hill slant, but that recalling and revealing secrets would promote relative differences in slant estimation.
2. We included a catch trial in both studies to identify careless responders (Oppenheimer, Meyvis, & Davidenko, 2009). The catch item displayed an image of a park. The first part of the question asked participants to estimate the temperature of the park, and we suspected that some participants would type qualitative descriptions, because the question followed two other items in which participants chose among ranked, qualitative ratings (e.g., *not at all* or *very* sturdy). However, the second part asked participants to provide a numerical estimate in degrees Fahrenheit. Those who failed to do so (e.g., said "very warm," rather than "70") did not read the question carefully enough and were therefore excluded. Twenty-two participants failed the catch trial, a rate of careless responding on Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011) similar to that found in prior work (e.g., Downs, Holbrook, Sheng, & Cranor, 2010; Horton, Rand, & Zeckhauser, 2011). An additional participant was excluded for not typing anything when asked to reveal a secret.
3. The actual slant of the hill participants viewed is unknown. Although the current research did not examine accuracy of slant judgments, for the interested reader, drawing from normative data from Proffitt, Bhalla, Gossweiler, and Midgett (1995), we speculate that the current pictured hill is approximately between 20° and 30° steep.
4. Several a priori exclusion data were enforced. As in Study 1, participants who were identified as careless responders because they failed the catch trial ($n = 60$, again a standard proportion for careless responders; Downs et al., 2010; Horton et al., 2011) were excluded. After correcting for skew, one participant's average distance estimate was greater than 3 *SD* from the mean and was excluded. In the cognitive load condition, eight participants misreported multiple digits of the given number, and one reported that they wrote the number down, rather than memorize it, and therefore these participants failed the manipulation check and were excluded. Finally, one participant was excluded for not typing anything when asked to reveal a secret.

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