

# The Cost of Keeping It Hidden: Decomposing Concealment Reveals What Makes It Depleting

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People possess information or identities that it sometimes behooves them to conceal, but at what cost? Participants who were instructed to conceal information during a short interview—either their sexual orientation (Studies 1–3) or specified words (Study 4)—showed evidence of self-regulatory depletion. Concealment led to deficits in intellectual acuity, interpersonal restraint, physical stamina, and executive function. We decomposed depletion into 2 component processes that, together or separately, might contribute to the observed depletion. When actively concealing information, one must monitor for specific content to inhibit. If taboo content is detected, one must modify or alter one's speech from what one would have said otherwise. Concealment produced depletion even when there was no need to actually alter one's speech (Studies 2 and 4), demonstrating that monitoring one's speech for content to conceal was sufficient to cause depletion. In contrast, having to alter one's speech without having to monitor for specific content to inhibit—either by adding false content (Study 3) or inserting specific words into one's speech stream (Study 4)—did not lead to measurable depletion. In this way, the studies are the first to assess which part of an act of self-regulation—monitoring for specific behavior to override or the actual altering of that behavior—is responsible for observed depletion. Furthermore, the research suggests that social environments that explicitly or implicitly encourage identity concealment may prevent people from performing optimally.

**Keywords:** concealment, self-regulation, task monitoring, depletion, sexual orientation

People routinely have to choose what information to reveal, and what to keep hidden. In order to present themselves well, people often refrain from disclosing blunders or shortcomings (Alicke & Sedikides, 2010; Goffman, 1963; Paulhus, 1984), “oversharing” with those they do not know well (Collins & Miller, 1994), or revealing their devalued traits or identities to others (Pachankis, 2007). In other words, people frequently keep certain information concealed from others. Although such secret keeping may be intended to avoid adverse interpersonal outcomes, does concealment itself have any deleterious consequences for the self?

Previous research has identified negative consequences of concealment that fall roughly into one of two categories. First, keeping secrets can damage the intimacy of relationships. For example, concealing information from one's partner leads to subsequent relationship dissatisfaction (Dailey & Palomares, 2004; Uysal, Lin,

Knee, & Bush, 2012). Complementing these findings, individuals who believed their partner was concealing information from them reported declining marital satisfaction over time (Finkenauer, Kerkhof, Righetti, & Branje, 2009). Second, if one tries to keep a secret by attempting to suppress the content from even entering one's own consciousness (e.g., sexual trauma that one would prefer not to think about, much less disclose), this strategy may backfire. Wegner and colleagues have shown that such attempts at thought suppression frequently lead that information to remain on the forefront of consciousness (Lane & Wegner, 1995; Smart & Wegner, 1999; Wegner, 1992, 1994, 2009). As a result, the stage is set for the person to be ironically *more* likely to reveal the information he or she was trying to conceal.

In the present article, we examine another negative consequence of concealment and attempt to uncover what component of concealment is responsible for the effect. We suggest that the act of trying to keep information hidden during a conversation may exact a toll on one's regulatory resources. And indeed, the way in which this phenomenon is described linguistically—*keeping* a secret—hints that effort is required to avoid disclosure (DePaulo, 1992; Pennebaker & Chew, 1985). If concealing information is sufficiently depleting, then the act of keeping secrets may lead to self-regulatory impairment.

Previous work on ego depletion has shown that even short periods of self-regulatory exertion in a particular domain lead to decrements in subsequent acts of self-regulation across domains (Baumeister, Vohs, & Tice, 2007; Hagger, Wood, Stiff, & Chatzisarantis, 2010). Findings in this area suggest that a person who, for example, expended sufficient regulatory resources by suppress-

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ing an emotional response to a humorous video would have difficulty performing intellectually (Baumeister, Twenge, & Nuss, 2002), controlling their eating (Kahan, Polivy, & Herman, 2003), maintaining physical exertion (Inzlicht, McKay, & Aronson, 2006), controlling aggressive impulses (Denson, Pedersen, Friese, Hahm, & Roberts, 2011), or engaging in rational decisionmaking (Bruyneel, Dewitte, Vohs, & Warlop, 2006). Although previous research has not tested whether concealment in particular is depleting, Vohs, Baumeister, and Ciarocco (2005) did find that trying to manage impressions under particularly challenging circumstances (e.g., trying to come off as both competent *and* likeable to a skeptical [vs. non-skeptical] audience), or in ways that required norm violation (e.g., presenting oneself in a self-enhancing [vs. modest] way to a friend), took a regulatory toll.

In this article, we tested the novel prediction that concealing information during an interaction leads to subsequent self-regulatory depletion. We also focus on the specific processes involved in concealment to determine which are responsible for the depletion effects. We decompose concealment into two complementary tasks that have been described as underlying acts of self-regulatory control. In what follows, we discuss how these processes apply to concealment, review hints from previous research that suggest which component may be responsible for depletion, and then outline our strategy for answering this question empirically.

### The Act of Concealment While Participating in a Conversation

For all of the demonstrations of depletion effects, there has been comparatively little research on understanding why and when depletion effects emerge. As Inzlicht and Schmeichel (2012) recently noted, “Research in this area has sacrificed deep explorations of process for broad explorations of application” (p. 453). One line of mechanistic work has focused on glucose as a possible biophysiological mediator (Gailliot & Baumeister, 2007; Gailliot et al., 2007), though not without controversy (Beedie & Lane, 2012; Molden et al., 2012). Another line has emphasized that depletion effects may stem more from a (malleable) belief that one has insufficient energy instead of a fixed physical deficit (Job, Dweck, & Walton, 2010). Regardless of how this debate is ultimately resolved (see Vohs, Baumeister, & Schmeichel, 2012, for one attempt), it would leave unanswered the question of what component(s) of self-regulation are responsible for depletion. What are the types of cognitive processes that are so taxing of one’s resources?

It is useful to decompose self-regulation into component processes, so one can test whether one process or multiple processes are the cause of depletion. In regulating, Baumeister and Vohs (2007) have stated that people attempt to “bring behavior (or other states) into line with some standard such as an ideal or goal,” and they have noted that “the most common form of regulation is to override and stifle” (p. 2). In self-regulating, one must be constantly *monitoring* for signs that one’s behavior may depart from a standard, and then at times actually *alter*, override, or stifle these deviant behavioral impulses. This distinction is found in models of action control (see Carver & Scheier, 1981, 1982) in which people must monitor for deviations from a standard (*monitoring*) and then bring their behavior into line with that standard (*alteration*). The

same distinction can, roughly, be noted even earlier in the T.O.T.E. (Test, Operate, Test, Exit) model of self-control (see Miller, Galanter, & Pribram, 1960), which suggests that people Test whether certain conditions have been met (*monitoring*) and then Operate to bring behavior closer in line to that desired standard (*alteration*). These two functions—that map onto the more general self-control processes of task monitoring and operating processes, respectively (Robinson, Schmeichel, & Inzlicht, 2010)—apparently have different neurological bases. Monitoring processes are associated with the anterior cingulate cortex, and actual alteration is implemented by the prefrontal cortex (Dehaene, Posner, & Tucker, 1994; Kerns, Cohen, MacDonald, Stenger, & Carter, 2004).

The act of concealing information during a conversation would seem to require both monitoring (for content to inhibit) and (speech) alteration,<sup>1</sup> which could—individually or in combination—contribute to any subsequent depletion effects. First, people must be vigilant for content that they must inhibit from entering their speech stream. Such monitoring occurs as part of the general monitoring that linguists have argued people engage in as a standard part of expression (Levelt, 1999; Roberts & Kirsner, 2000; Segalowitz, 2010). However, when keeping a secret, this monitoring becomes potentially burdensome, as one must be constantly attentive and mobilized to inhibit specific taboo content. Second, it is also sometimes necessary to actually alter the content so as to avoid actually revealing the hidden content. That is, it may be necessary to change what one would have said otherwise so as not to reveal what one wishes to conceal. Thus, if concealment produces depletion, this may stem from monitoring one’s potential speech stream for content to inhibit (*monitoring*), from the act of altering or modifying one’s speech (*alteration*), or from both mechanisms (additively or only when both are present).

Let us consider in more detail these two components of concealment. Imagine a person who is attempting to conceal his sexual orientation. In conversing with an acquaintance, a restaurant is mentioned that the man and his boyfriend have frequently patronized. Because he is vigilantly monitoring for any sign of the taboo content to inhibit, an internal alarm sounds before he utters, “My *boyfriend* and I go there all the time!” Being on the lookout for this content *is* the monitoring-to-inhibit component of concealment. But then, he must edit or alter his speech so as not to disclose his sexual orientation. Thus, he might say, “My *friend* and I go there all the time.” This modification *is* speech alteration. If concealment does indeed produce regulatory deficits, the effect could be tied to monitoring, alteration, or the two in combination.

Although the two processes typically co-occur in concealment (or other acts of self-regulation), we can imagine how prospectively monitoring for possible violations to be inhibited, or actual alteration of what one would have spontaneously said, can occur separately. We exploit this potential dissociation in our experimental design. Imagine that even though a person is monitoring to make sure he does not reveal his sexual orientation, the conversation does not turn to one’s personal life but instead remains stuck on an upcoming exam. In this case, his desire to conceal his sexual orientation means he may remain vigilant of his speech stream for

<sup>1</sup> To avoid cumbersome phrasing, we typically use the one-word term *monitoring* to refer to “task monitoring for specific content to inhibit.” Similarly, we use *alteration* to refer to “speech alteration.”

content that should not be revealed. However, given the topics discussed, he does not have to actually alter what he was going to say.

Imagine instead that a person is not attempting to conceal specific information (which by definition involves monitoring for content to conceal) but does have a goal to alter her speech. Instead of remaining vigilant about concealing some specific information, she instead wants to make sure that she inserts some information. More generally, one can intentionally alter one's behavior without needing to be constantly monitoring for behavior to suppress. Consider a woman who is being repeatedly approached by male suitors in a bar. In an effort to ward off their advances, she makes forced reference to "her boyfriend" even though the conversation does not demand it. In this case, the woman is not monitoring for specific taboo content to inhibit, but she is altering her speech from what she would say naturally.<sup>2</sup>

Although we ultimately test whether monitoring and/or alteration are responsible for subsequent depletion effects, there are reasons to believe—based on previous speculation and research—that *monitoring* is what is particularly depleting. Evidence speaking to this comes in two varieties. First, previous discussions of concealment suggest that monitoring may be particularly taxing. In describing why disclosing secrets is therapeutic, theorists have described how this removes the constant work required to conceal this information (Pennebaker, 1990; Stiles, 1987). This "constant work" describes the need for ever present *monitoring*, not necessarily the occasional need to *alter* one's behavior. In a particularly prescient passage, Lane and Wegner (1995) have described what is taxing about concealment by noting, "Secret keeping is a performance, and stringent behavioral proscriptions ensure that the performer is on edge" (p. 238). Presumably this "on edge" nature is describing the vigilance of monitoring. Finally, in setting up why they believe that interracial contact may be depleting for those who have prejudicial inclinations they would like to conceal, Richeson and Trawalter (2005) have noted that "individuals carefully monitor their thoughts, feelings, and behavior" (p. 935). They later report that discussing a racially-sensitive topic with an opposite-race partner is depleting, unless the participants provided scripted responses. Although following a script requires that one alter one's speech from what one have said otherwise, reliance on scripted responses should reduce the need to monitor to inhibit one's own prejudicial impulses. Even though the authors do not discuss their results in these terms, we see this as possible evidence that it is monitoring and not alteration that made the interracial contact depleting.

Second, moving beyond the specific question of concealment, some research indicates that self-regulatory depletion exacts a cost on the neural monitoring system, which may hint that previous overuse of that system is responsible for the depletion: After a depleting failure, participants showed reduced evoked brain potentials from the anterior cingulate cortex (ACC) that signal strength of conflict monitoring (Botvinick, Braver, Barch, Carter, & Cohen, 2001; Yeung, Botvinick, & Cohen, 2004) and are implicated in effective self-control (Compton et al., 2008). After an initial act of self-control, a reduction in such brain potentials mediated the decline in performance on a subsequent task (Inzlicht & Gutsell, 2007). If self-regulation at Time 1 produces self-regulatory impairment at Time 2, and it is monitoring that is

impaired at Time 2, it is certainly plausible that it was the exhaustion of monitoring at Time 1 that led to these effects.

## Overview of the Present Research

The present research had two aims. First, we aimed to test whether even short episodes of concealment would produce subsequent cognitive and physical self-regulatory deficits (Studies 1–4). Second, we sought to uncover what aspect of concealment—monitoring one's speech with a readiness to inhibit specific content, or altering one's speech—is responsible for the observed deficits (Studies 2–4). If monitoring alone is sufficient to deplete regulatory resources, then instructions to conceal content should continue to exhaust one's resources even when actual alteration of one's speech is unnecessary. This is because only monitoring is required when one inhibits content that one would not have revealed. If alteration alone is sufficient to deplete regulatory resources, then speech modification—even when it does not involve monitoring for content to inhibit—should produce the same effect. A third possibility is that both monitoring and alteration may be necessary for depletion to occur.

Furthermore, we wanted to probe the robustness of the above findings, as well as hint at contexts in which our findings might be relevant. Toward this end, we tested whether similar effects emerged regardless of whether participants concealed self-relevant or self-irrelevant content. In Studies 1–3, participants were asked to conceal their sexual orientation. Because our interest is in the consequences of concealment, not the stresses that come from managing a concealable stigma, we recruited only heterosexual participants. In Study 4, participants were asked to conceal specific, non-identity-related words. We expected that regardless of what was being concealed, similar lessons would emerge. Also, each study used a different indicator of depletion: diminished performance on a task requiring complex thinking (Study 1; Schmeichel, Vohs, & Baumeister, 2003; Vohs et al., 2012), less restraint in responding to an angering e-mail (Study 2; Chan & Wan, 2012), reduced physical stamina (Study 3; Muraven, Tice, & Baumeister, 1998; Vohs et al., 2005), and greater interference on a Stroop task (Study 4; Inzlicht & Gutsell, 2007; Richeson & Trawalter, 2005). By observing consistent effects across these measures, we can be more confident that we are examining concealment's effects on depletion as opposed to some other psychological construct that might influence some, but not all, of these common indices of depletion.

## Study 1

Study 1 sought to test whether concealment is depleting. A rigged coin flip assigned all participants to be interviewed by a confederate. Some participants were instructed to conceal their sexual orientation during the 10-min interview. After the interview, all participants completed a test of spatial reasoning ability.

<sup>2</sup> Of course, in this case the woman is still "monitoring" the situation for an opportunity to insert this lie. However, this monitoring is different from task monitoring involved in concealment, in which one must internally monitor for prospective deviations that one must stifle or inhibit. This admittedly reflects the limitations of using terms (like "monitoring") that have broader meaning in colloquial English than intended in technical writing.



Schmeichel et al. (2003) found that depleted individuals do worse on intelligence tasks that require complex thinking (as opposed to those that require the mere retrieval of facts). We hypothesized that those participants who had just concealed their identities would show evidence of depletion by performing worse on the spatial ability measure. Thus, Study 1 attempts to test only whether concealment is depleting, whereas the subsequent studies will attempt to understand why it is.

## Method

**Participants.** Sixty-six heterosexual undergraduates at Cornell University completed the study for extra course credit in their psychology, human development, and communications courses. Participants were randomly assigned to a conceal or control condition.

**Procedure and materials.** Participants always arrived at the lab before the confederate. While waiting for his arrival, participants rated themselves on several abilities from 1 (*much worse than the average student at Cornell*) to 9 (*much better than the average student at Cornell*). Included in the list was *spatial intelligence*, which we planned to use as a covariate in our analyses of participant performance. This could permit us to control for (self-reported) baseline ability.

At that point, the confederate (posing as a real participant) arrived. Following a rigged coin flip, the confederate was always “randomly selected” to be the interviewer. The participant was the interviewee. The experimenter would then separate the confederate and the participant before delivering instructions to each person individually. To the participant, the experimenter explained that although the confederate had been informed that the study was about getting to know a stranger, in actuality, the study was about memory. This provided a cover story for why some participants were asked to conceal their sexual orientation. Supposedly, the confederate would later be probed to determine whether he or she remembered whether the participant had revealed certain content. Those participants in the conceal condition received these special instructions:

We want you to hide one piece of information about yourself: your sexual orientation. In other words, if you refer to a date or a significant other, real or hypothetical, you cannot use a word that would reveal the person’s gender. So, for example, instead of saying “I tend to date men who . . .,” you could say, “I tend to date people who . . .” Instead of saying, “One time my girlfriend and I . . .,” you could say, “One time my significant other and I . . .” We are interested to what extent the other participant will falsely remember that you revealed this information about yourself. Because you do not want to arouse suspicions in the other participant, please do your best to act naturally, and make sure you do not slip up.

Six of the seven questions related directly or indirectly to one’s sexual orientation (see Appendix A). Participants trying to conceal their sexual orientation thus would have to monitor for content to inhibit, but also actually alter their speech from what they would have said otherwise.

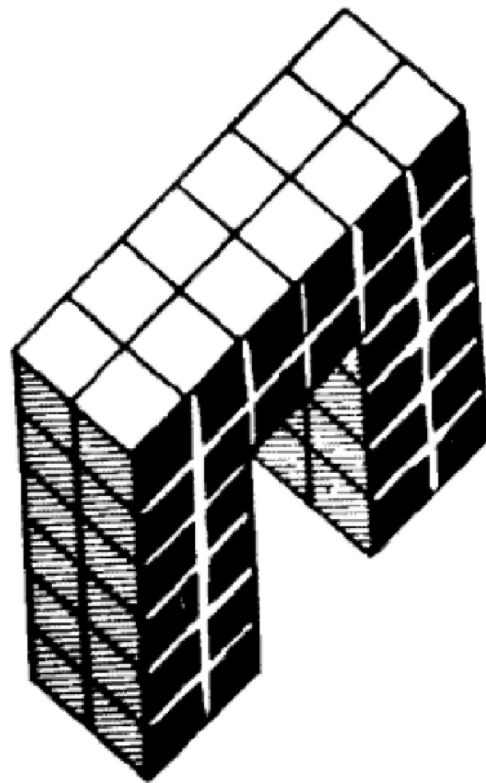
After the interview, participants were escorted to a private cubicle. The confederate was left in the original room, supposedly to complete the memory test. Once in the new room, the participant completed a 12-min, 24-item block-counting task. The test measured the spatial factor of general intelligence, and similar

items appear on the Army General Classification Test (Arco, 2002). Each item consisted of a two-dimensional representation of a 3-D “tower” of equally-sized cubes. The test-taker must mentally manipulate and rotate the figure to count how many unit cubes compose the figure (see Figure 1). Participants were not allowed to mark on the page. This served to make the task more complex by more clearly placing demands on participants’ working memory resources.

## Results and Discussion

During the interview, the confederate surreptitiously coded how many times the participant revealed his or her sexual orientation. As reflected in the instructions, a revelation was any time that the participant stated the gender of a dating or romantic partner. Thus, the sentence, “I’ve only dated one person this year,” would not count as a revelation. In contrast, the sentence, “My partner and I spent Spring Break with her family,” includes the gendered pronoun “her” and thus would count as one revelation. Confirming the manipulation’s success, participants in the conceal condition revealed their sexual orientation fewer times over the course of the interview ( $M = 0.18$ ,  $SD = 0.46$ ) than did those in the control condition ( $M = 0.97$ ,  $SD = 1.13$ ),  $t(42.5) = 3.70$ ,  $p = .001$ ,  $d = 0.93$ .

An analysis of covariance (ANCOVA) revealed that control participants correctly answered more items on the block-counting



*Figure 1.* Study 1: Example item from the 24-item block-counting task. Participants had to count the number of unit blocks, but they were not permitted to mark on the figures while doing so. Some blocks cannot be directly observed but must be inferred (Answer = 56 blocks).

task ( $M = 57.8\%$ ) than did conceal participants ( $M = 47.6\%$ ),  $F(1, 61) = 4.80, p = .03, \eta_p^2 = .07$ . Neither this effect, nor any effect in subsequent studies, was qualified by gender,  $F(1, 61) = 1.76, p > .18, \eta_p^2 = .03$ , so the variable will not be discussed further. The one covariate, spatial intelligence, only accounted for minimal variance,  $F(1, 61) = 2.27, p > .13, \eta_p^2 = .04$ . Of course, self-ratings of ability are often mediocre predictors of actual performance (Critcher & Dunning, 2009; Dunning, 2005). Given the weakness of the covariate, future studies (where possible) instead used a pre-/post-test repeated-measures design to more effectively account for irrelevant, participant-specific sources of performance variance.

Study 1 provided an initial demonstration that concealment is depleting. After just 10 min of concealing one's sexual orientation, participants showed depressed performance on a spatial ability measure. Of course, these results do not yet address the other main goal of our article: to understand what aspect of concealment is depleting. Although all studies in this article include our standard conceal condition (in which monitoring and alteration are required) as well as a control condition (in which neither is required), the remaining studies also include conditions that permit us to determine how monitoring and alteration, separately or together, produce depletion.

## Study 2

Study 2 expanded on the first study in three ways. First, we offered our initial test of why concealment depletes regulatory resources. Those concealing their sexual orientation in Study 1 had to constantly *monitor* their prospective speech stream with a readiness to inhibit content before it was uttered. And when such taboo content was detected, participants had to *alter* their speech from what they would have said otherwise. Study 2 again included a conceal (i.e., monitoring + alteration) and a control condition, but it also included a third condition that required monitoring, but not alteration. In the new *monitoring only* condition, participants were asked to conceal their sexual orientation while answering questions that had no relation to one's sexual orientation or dating life. If this new monitoring only condition produced evidence of depletion compared to a control condition, it would show that monitoring alone is sufficient to produce regulatory deficits. By comparing the conceal condition (monitoring + alteration) to the monitoring only condition, we can see whether a need to alter one's speech contributes to depletion when people are already monitoring for content to inhibit. Although Study 1 was not designed to distinguish the contribution of monitoring versus alteration to the observed depletion effects, one hint lends credence to our initial argument that monitoring alone may be sufficient to produce the observed depletion effects. Participants in the control condition spontaneously revealed their sexual orientation less than once per interview in Study 1. From this, one can infer that there was not much alteration required of those in the conceal condition, supporting our argument that monitoring alone may be sufficient for depletion to emerge.

Second, we moved to a new measure of regulatory depletion, which relies on findings that depleted individuals are less likely to behave with restraint toward an insulter (e.g., Stucke & Baumeister, 2006). Chan and Wan (2012) found that depleted customer service agents performed less well in a simulation that required

them to respond to customer service complaints. In short, without full self-regulatory resources, the agents responded to annoying e-mails in a way that was not sufficiently nice. We adapted this simulation to one that would have clearer relevance for our undergraduate participants. In the simulation, participants responded to a blunt, somewhat obnoxious e-mail from a teaching assistant who was said to control their grade. We predicted that participants who had had to conceal their sexual orientation would respond with less politeness and greater anger than would control participants.

Third, we wanted to address a pair of concerns rooted in a worry that those trying to conceal their sexual orientation may have approached the task by trying to suppress all thoughts of their sexual orientation. If those in the conceal (i.e., monitoring + alteration) and the monitoring only conditions adopted this strategy, this attempted suppression might backfire. That is, their minds may be flooded with unintentional thoughts of their sexual orientation. Lane and Wegner (1995, Study 2) found that this ratio of unintentional to intentional thoughts was greater when trying to suppress information than when given no special instructions. If so, monitoring for content to inhibit may show signs of depletion not because monitoring itself is taxing, but because the task of concealment has become much more difficult because of the unintentional thought intrusion (regardless of whether the discussion relates to one's sexual orientation). Relatedly, thought suppression has been found to be depleting in itself, likely in part due to the difficulty of thought suppression in light of the ironic process outlined above (e.g., Muraven et al., 1998).

Although we ultimately address this alternative empirically, we found it unlikely that participants were engaging in thought suppression. Although Lane and Wegner (1995, Study 2) would seem to offer empirical precedent for this possibility, those authors asked their participants to avoid revealing a secret word while writing in a stream of consciousness manner. Thus, the natural (though ironically unsuccessful) strategy for keeping the word out of consciousness (and thus out of one's stream-of-consciousness writing) is to suppress it from consciousness. Although we do not question that some people attempt to suppress thoughts they would like to keep hidden from others, we suspected that our participants, if anything, were intentionally keeping their sexual orientation in mind as they monitored their potential speech stream to make certain they did not reveal this content. Of course, it remained possible that merely monitoring for content to conceal—even in the absence of attempts at thought suppression—itself caused thoughts of one's sexual orientation to unintentionally spring to mind (and into one's potential speech stream). To address these alternatives, we included measures to compute Lane and Wegner's unintentional-intentional thought ratio. We predicted that the ratio would neither vary by condition nor account for the effects of concealment on depletion.

## Method

**Participants and design.** One hundred seven heterosexual undergraduates at the University of California, Berkeley, completed the study in exchange for course credit or \$15. Participants were randomly assigned to a control, conceal (monitoring + alteration), or monitoring only condition.

**Procedure and materials.** The experimental paradigm was similar to that used in Study 1 except for four key changes. First, we developed a new set of seven questions, similar in form to those used in Study 1, but that focused on one's academic life, not one's personal life (see Appendix B). Only those in the monitoring only condition were asked these questions; those in the other two conditions again answered the questions used in Study 1 (see Appendix A). We conducted a pilot study in which 43 participants were asked these seven new questions. Regardless of whether or not participants were asked to conceal their sexual orientation, no participant revealed his or her sexual orientation when responding to these questions. Thus, concealing one's sexual orientation while responding to these questions requires monitoring for content to inhibit but no actual speech alteration.

Second, after the interview, participants completed six items—all modified from Lane and Wegner (1995) to match the present paradigm—about their interview experience. Three items asked to what extent participants intentionally thought about their sexual orientation ( $\alpha = .87$ ; e.g., "I actively tried to think about my sexual orientation during the interview"). Three items were Lane and Wegner's unintentional thought items ( $\alpha = .88$ ; e.g., "Sometimes I thought of my sexual orientation over and over"). Lane and Wegner noted the two indices are highly correlated (no doubt in part because the unintentional thought items could refer to either unintentional or intentional thought—i.e., one could intentionally think of one's sexual orientation over and over), and thus recommended taking a ratio of unintentional-to-intentional thought to capture the relative amount of unintentional thought. We use this ratio in our analyses. Third, we included a manipulation check to make certain that participants understood the instructions. All participants indicated whether they "actively tried to keep [their] sexual orientation a secret during the interview." All of these items were responded to on 6-point scales anchored at 1 (*not at all*) and 6 (*very much so*).

Fourth, we used a new measure of depletion. After the interview, participants were led to what they were told was a new study on e-mail communication. They learned they would go through a simulation in which they would receive background information, read an e-mail they had received, and then compose what thought was an "appropriate" response. Participants were asked to consider the following background information:

Your GSI [graduate student instructor] for a class you are taking at Haas contacts you with feedback on an assignment that you made a good-faith effort to complete well. You knew it was not the best work you had ever turned in, but you certainly don't expect that you professor or GSI would be displeased with the quality of your work.

Participants were logged into an e-mail account where a single e-mail titled "Feedback" was present. Participants were told they should read the e-mail and respond to it. The e-mail read as follows:

Hello, I am writing to provide feedback on your class assignment. You obviously didn't follow my instructions. You clearly didn't focus on the key elements of the assignment. I don't know how anyone could have made such an obvious mistake. I hope to see improvement from you.

Participants then submitted a reply. Four research assistants—all blind to participants' conditions—rated every e-mail response on

how polite and angry it was on scales ranging from 1 (*not at all*) to 9 (*very much so*). The two ratings were negatively correlated,  $r(105) = -.81, p < .001$ . We subtracted the anger ratings from the politeness ratings so that higher numbers would reflect an e-mail successfully written with more restraint—one in which a student addressed the graduate student instructor with more politeness and less anger.

## Results

Confirming that those asked to conceal their sexual orientation actually did so, we found participants revealed their sexual orientation more times in the control condition ( $M = 2.10, SD = 2.74$ ) than in either the monitoring + alteration ( $M = 0.19, SD = 0.83$ ),  $t(105) = 5.06, p < .001, d = 0.99$ , or monitoring only ( $M = 0.17, SD = 0.70$ ) conditions,  $t(105) = 4.95, p < .001, d = 0.97$ .<sup>3</sup> Also as expected, participants in both the monitoring + alteration ( $M = 4.40, SD = 1.89$ ) and monitoring only ( $M = 3.56, SD = 1.93$ ) conditions reported more actively keeping their sexual orientation a secret than those in the control condition ( $M = 1.24, SD = 0.95$ ),  $t(104) = 7.68, p < .001, d = 1.51$ , and  $t(104) = 5.44, p < .001, d = 1.07$ , respectively. Perhaps reflecting that those in the conceal (monitoring + alteration) condition had to actively alter their speech to keep their secret, these participants reported more active secret-keeping than did those in the monitoring only condition,  $t(104) = 2.19, p = .03, d = 0.43$ .

We then tested whether control participants (+2) wrote e-mails that were more polite and less angry than those in the conceal (−1) and the monitoring only (−1) conditions. Indeed, the planned contrast was significant,  $t(104) = 2.40, p = .02, d = 0.47$ . The means by condition and rating dimension are provided in Table 1. Follow-up comparisons showed that attempts to conceal one's sexual orientation led to less polite responses, regardless of whether or not concealment required active alteration of one's speech content. That is, control participants' e-mails were rated as more polite and less angry ( $M = 3.28, SD = 2.16$ ) than either monitoring + alteration participants ( $M = 1.87, SD = 2.78$ ),  $t(104) = 2.28, p = .02, d = 0.45$ , or monitoring only participants ( $M = 2.01, SD = 2.55$ ),  $t(104) = 1.98, p = .05, d = 0.39$ . The standard conceal (monitoring + alteration) and monitoring only conditions were statistically indistinguishable,  $t < 1$ .

Finally, we tested whether the conditions differed in the extent to which participants unintentionally dwelled on their sexual orientation. Contradicting this alternative account, the conditions did not differ on the unintentional thought ratio,  $F < 1$ . Furthermore, the ratio did not correlate with the e-mail politeness index,  $r(105) = -.10, ns$ . We regressed the politeness index on the thought ratio and took the standardized residuals. This permitted us to reconduct our main analyses while controlling for the unintended thought ratio. The focal contrast on these residuals re-

<sup>3</sup> Two participants in the monitoring only condition actually revealed their sexual orientation, even though our pretesting indicated that people never revealed their sexual orientation to these questions. We think that these two participants may have misunderstood that they *should* reveal their sexual orientation. Both participants' response on the secrecy manipulation check was a 1 (that they did not at all try to keep their sexual orientation a secret). Excluding them did not change the pattern of results or statistical significance of the findings.



Table 1  
Study 2: Average (Standard Deviation) Coded Politeness and Anger in Participant E-Mails

Rating	Condition			Contrast (+2, -1, -1)
	Control	Conceal	Monitoring only	
Politeness	6.00 (1.17) <sub>a</sub>	5.51 (1.36) <sub>a</sub>	5.49 (1.29) <sub>a</sub>	$t = 1.78, p = .08$
Anger	2.72 (1.11) <sub>a</sub>	3.63 (1.56) <sub>b</sub>	3.48 (1.41) <sub>b</sub>	$t = -2.73, p = .01$
Composite	3.28 (2.16) <sub>a</sub>	1.88 (2.78) <sub>b</sub>	2.01 (2.55) <sub>b</sub>	$t = 2.40, p = .02$

Note. The Conceal condition is the Monitoring + Alteration condition. Means in the same row that do not share the same subscripted letter differ at the  $p < .05$  level. The composite is calculated as the Politeness rating minus the Anger rating.

mained significant,  $t(104) = 2.34, p = .02, d = 0.46$ , as did each follow-up comparison ( $ps \leq .05$ ).

## Discussion

Study 2 replicated and extended the findings of the earlier studies with a new measure of regulatory depletion and a new condition that helped to home in on the depleting nature of concealment. Merely monitoring one's speech stream for content to conceal, even when no alteration was required, was sufficient to reduce the politeness with which one responded to an annoying e-mail. In general, people do well to restrain displays of anger when addressing their superiors. Just as employees would do better to not respond in kind to a provocation from their boss, undergraduates would not stand to gain much by responding with anger to their superior who would be assigning them a grade. The present results therefore extend beyond intellectual ability to show how concealment can impair interpersonal relations.

There was no evidence that the ratio of unintended-to-intended thoughts—identified as a key consequence of thought suppression by Lane and Wegner (1995)—was affected by either concealment manipulation. Thus, it is unlikely that the monitoring only condition was depleting because of an ironic process by which these participants became unintentionally preoccupied with their sexual orientation, thereby making it impossible for them to answer the questions without altering out references to their sexual orientation. We conducted a post-test to address this alternative a second way. Twenty-nine participants went through the same interview paradigm either under instructions to conceal their sexual orientation or under no special instructions. After the interview, participants answered two questions on 9-point scales: "How easy was it to formulate answers to the questions?" and "How easy was it to follow the instructions while you were answering the questions?" These responses were averaged to reflect *answering ease*,  $r(27) = .41, p = .03$ . If anything, those in the conceal condition found answering the questions (non-significantly) easier ( $M = 7.50, SD = 1.18$ ) than did those in the control condition ( $M = 6.75, SD = 1.06$ ),  $t(27) = 1.68, p > .10, d = 0.65$ . Thus, there was no indication—from the main study or our follow-up study—that attempting to conceal one's sexual orientation actually made it more difficult to answer the interview questions, because (as this account would go) one had lost control over one's sexual-orientation-related cognitions. Instead, the evidence suggests that monitoring for content to inhibit is itself depleting.

## Study 3

Study 3 extended the previous investigations in two primary ways. First, we moved to a new measure of regulatory strength—the ability to consistently exert physical strength in the face of exhaustion. Second, although Study 3 showed that monitoring + alteration (i.e., the standard conceal condition) did not produce extra depletion than did monitoring alone, this could be because *either* monitoring alone or alteration alone would be depleting, but the addition of one once the other is in place is not additionally depleting. To assess this possibility, we created a condition in which participants would have to alter their speech from what they would have said spontaneously, but without the need to constantly monitor their internal speech stream for content to inhibit. In this new alteration only condition, participants were asked to add to each of their answers one statement that they would not have said otherwise. To be certain the statement did indeed require participants to alter their speech, we asked that the addition be a lie.<sup>4</sup>

Our primary hypothesis was that those in the conceal (monitoring + alteration) condition would show evidence of self-regulatory depletion compared to those in the alteration only ("lie" condition) and control conditions. This pattern would support three conclusions. First, and consistent with our interpretation of Study 2, this would support our hypothesis that it is monitoring to inhibit, not speech alteration, that is responsible for the depleting nature of concealment. Second, it would show that what is depleting is not just an attempt to "monitor" (in the broader sense of the word, see Footnote 2) the context in an effort to conform to task instructions. Instead, we argue that task monitoring in the service of preemp-

<sup>4</sup> We could have had those in the alter condition lie about their sexual orientation. Although this would have made the conceal and alteration only conditions more parallel in terms of content, such a design would be less desirable for two reasons. First, it would require all of our participants in the alteration only condition to pretend to be a member of a stigmatized group. This would make the condition even less parallel. Second, lying about one's sexual orientation in the context of a discussion about sexual orientation would require both monitoring and alteration. Also, as the "lie" manipulation check in Study 3 suggests, participants in our conceal conditions did not alter their speech by lying about their sexual orientation. Instead, they were simply coy—altering their speech by using gender-neutral language or by avoiding references to significant others altogether. Thus, actively lying about sexual orientation is not how those attempting to conceal it altered their speech. For readers who wish that the conceal and alteration only conditions were more parallel in terms of the specific content that is concealed versus revealed through alteration, Study 4 offers this feature.

tively eyeing self-control lapses that must be inhibited is what is particularly taxing. In this way, the study could offer more precision in identifying the nature of monitoring that is depleting. Third, it would show that depletion does not merely stem from an attempt to be coy with the truth. That is, if concealing one's sexual orientation is depleting, but adding in lies is not, then it is not this failure to be completely forthcoming with the truth that is producing the depletion effects.

## Method

**Participants and design.** Forty-one heterosexual undergraduates at Cornell University completed the study for extra course credit in psychology, human development, and communications courses. Participants were randomly assigned to a conceal (monitoring + alteration), alteration only, or control condition.

**Procedure and materials.** The study relied on an interview paradigm similar to those of the earlier studies but had the following unique features. First, we used a new measure of self-regulatory strength: physical stamina. Participants squeezed an exercise handgrip with their non-dominant hand in order to keep a small foam piece in place (between the handles) for as long as they could. The experimenter timed how long participants kept the grip sufficiently contracted, stopping the timer once the foam piece fell. Participants completed this strength task both before and after the interview.<sup>5</sup> Finally, we included a new *alteration only* condition. These participants were told to add one thing to each of their answers that they would not have said otherwise—a lie. There were no special instructions about what the content of the lie should be.

Although the confederate once again coded how many times the participants revealed their sexual orientation, there was no analogous way for the confederate to code how many times the participants lied. As such, after the interview, but before the second physical strength measure, participants indicated how often they provided information that was not truthful in their interview answers. Responses were provided on a scale ranging from 1 (*never*) to 9 (*on every question*).

## Results and Discussion

We conducted two planned contrasts that served as manipulation checks on whether (a) those in the conceal (monitoring + alteration) condition revealed their sexual orientation less frequently than those in the other two conditions, and (b) those in the alteration only condition altered their speech by inserting lies more frequently than those in the other two conditions. Both were true. One contrast showed that those in the control ( $M = 1.33$ ) and alteration only ( $M = 1.83$ ) conditions revealed their sexual orientation more often than those in the standard conceal condition ( $M = 0.00$ ),  $t(25.8) = 3.74$ ,  $p = .001$ ,  $d = 0.70$ . The second planned contrast found that those in the lie condition reported being less truthful ( $M = 7.11$ ) than those in the control ( $M = 1.92$ ) or conceal ( $M = 1.40$ ) conditions,  $t(23.4) = 8.30$ ,  $p < .001$ ,  $d = 2.82$ .

We submitted the physical strength measure to a 3 (condition)  $\times$  2 (time) mixed-model ANOVA, with the second factor assessed within-participants. The predicted interaction emerged,  $F(2, 37) = 4.31$ ,  $p = .02$ ,  $\eta_p^2 = .19$ . Those in the conceal condition held the

exercise handgrip for less time after the interview than before ( $M_s = 23.10s$  and  $15.07s$ ),  $t = 3.24$ ,  $p = .01$ ,  $d = 1.02$ . Those in the control ( $M_s = 14.99s$  and  $18.09s$ ) and alteration ( $M_s = 19.19s$  and  $23.13s$ ) conditions held the grip for non-significantly more time after the interview than before,  $t_s < 1.74$ ,  $p_s > .10$ ,  $d_s < 0.51$ .

We conducted 2 (condition)  $\times$  2 (time) follow-up tests to compare the conditions separately. Conceptually replicating the first two studies, physical strength was depleted in the conceal condition compared to the control condition,  $F(1, 37) = 7.06$ ,  $p = .01$ ,  $\eta_p^2 = .41$ . Furthermore, concealing one's sexual orientation (monitoring + alteration condition) depleted physical strength compared to those who had to alter their speech without being vigilant for content to conceal (alteration only),  $F(1, 37) = 6.64$ ,  $p = .01$ ,  $\eta_p^2 = .17$ . Alteration alone did not deplete resources,  $F < 1$ ,  $\eta_p^2 = .00$ .

Study 3 shows that concealment impacts not only intellectual acuity and interpersonal politeness, but physical strength as well. Furthermore, given that those who merely had to alter their speech streams (by adding untrue statements to their answers) did not show strength decrements, alteration alone is apparently not sufficient to produce the observed depletion effects. This also clarified the nature of monitoring that is depleting—task monitoring in preparation to inhibit. Merely looking for an opportunity to comply with instructions, a type of generalized “monitoring,” did not have the same effect. Furthermore, not telling the whole truth seems not to account for the depletion effects either.

## Study 4

To this point we have tested our hypotheses in a concealment domain of self-relevance: sexual orientation concealment. We chose to test our ideas in this way not because our reasoning was in any way specific to sexual orientation (much less stigma), so we wanted to make certain that our effect and our conclusions about process are not limited to sexual orientation concealment. Toward this end, Study 4 moved to a concealment context that is more artificial, but one that permits us to test whether our effects are more general. As an added benefit, this shift permitted even tighter operationalizations of concealment, monitoring, and alteration. Thus, Study 4 builds on the previous studies in three ways.

First, instead of focusing on sexual orientation, our experimental instructions required participants to monitor for content to inhibit and/or alter their speech with respect to two specified words that did not have identity relevance. Second, instead of testing for the influence of monitoring alone (Study 2) or alteration alone (Study 3), we fully crossed monitoring and alteration. This permitted us to conceptually replicate the effects observed in Studies 2 and 3 in this more generic concealment domain. Third, we used a new measure of regulatory resources, a Stroop task, which has been used in past research to demonstrate impairment of executive resources (Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009; Richeson & Shelton, 2003).

Participants were interviewed using the non-sexual-orientation-relevant questions used in Study 2's monitoring only condition (see Appendix B). The interview instructions asked participants to

<sup>5</sup> In our two studies that used a pre/post design, there was no failure of random assignment. That is, performance did not differ by condition at Time 1:  $F < 1$ ,  $p > .63$  (Study 3);  $F_s < 1.32$ ,  $p_s > .25$  (Study 4).



monitor, alter, both monitor and alter their speech, or do neither. Specifically, some were told to avoid saying two words that pretesting indicated they would not have spontaneously said (monitoring only): “breakfast” and “therefore.” Some were instructed to add in one of these two words—“breakfast” or “therefore”—that they would not have said (alteration only). Others were asked to avoid saying two words they likely would have spontaneously said (concealment: monitoring + alteration). These two words were much more common—“don’t” and “very.” Those in a control condition received no special instructions.

Before and after the interview, participants completed a Stroop task, a classic measure of executive control (Stroop, 1935). We predicted that we would observe a main effect of monitoring, such that Stroop interference would grow relatively stronger for those who had to monitor their speech for content to conceal. This would reinforce the finding in Study 2 that monitoring for content to inhibit is sufficient to produce regulatory depletion. Given that alteration alone (Study 3), or alteration when monitoring is already occurring (Study 2), was not found to contribute to depletion effects, we did not expect the main effect of alteration or the Alteration  $\times$  Monitoring interaction to be significant.

## Method

**Participants and design.** Forty-six undergraduates at Cornell University completed the study in exchange for extra course credit in their psychology, human development, or communications classes. Participants were randomly assigned to one of four conditions of a 2 (monitoring: required or not required)  $\times$  2 (alteration: required or not required) full-factorial design.

**Procedure and materials.** The procedure relied on the same interview paradigm used in the first three studies, but had the following unique features:

First, participants completed a Stroop Task (modified from Fagot, Dirk, Ghisletta, & de Ribaupierre, 2009) before and after the interview. On each trial, a stimulus appeared on the computer screen in one of four colors (red, yellow, green, or blue). Participants kept their middle and pointer fingers of each hand rested on four keys corresponding to each of these four colors. The participant’s task was to press the key corresponding to the stimulus’s color as quickly as possible. On control trials, the stimulus was a string of characters (e.g., “~~~~”). On Stroop trials, the text spelled one of the four color words, but one that did not correspond to the color of that particular word’s font (e.g., “green” in yellow font). After a practice block of 18 trials, there were six blocks of 18 trials each. As in Fagot et al. (2009), only correct responses and response latencies at or above 200 ms were included. Also, if there was no response within 2,000 ms, the trial was excluded, and the message “TOO SLOW!” appeared on the screen before participants could register a response. On average, 7.09 of the 108 trials (6.6%) were excluded for one of these reasons. To compute a Stroop score, we subtracted the mean reaction time on control trials from the mean reaction time on Stroop trials.

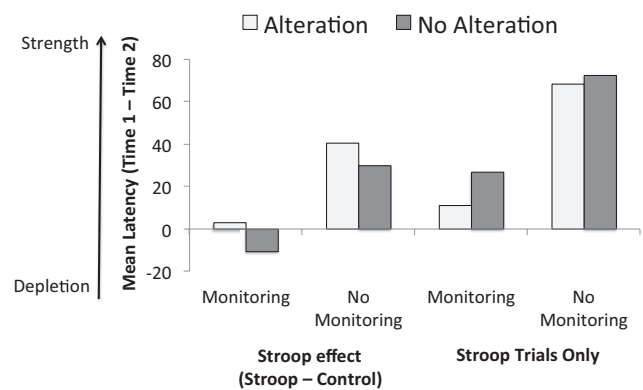
Second, the interview questions were those used in Study 2. They did not relate to sexual orientation (see Appendix B). Furthermore, the instructions differed by condition to evoke monitoring, alteration, both, or neither. Recall that monitoring is evoked when participants must screen their thoughts or speech stream with a readiness to inhibit forbidden content. Alteration is required

when participants must modify their speech output from what they would have said otherwise. Thus, in the *monitoring only* condition, participants had to avoid saying two words that participants never uttered when responding to the interview questions during pretesting (“breakfast” and “therefore”). In the *alteration only* condition, participants had to include in their answer to each question one of these never-said words (“breakfast” or “therefore”). In the *monitoring + alteration* condition, participants had to avoid saying two words that pretest participants had said frequently (“don’t” and “very”). Control condition participants received no special instructions.

## Results and Discussion

First, we submitted the Stroop scores to a 2 (monitoring: required or not required)  $\times$  2 (alteration: required or not required)  $\times$  2 (time: pre-interview or post-interview) three-way analysis of variance (ANOVA). As a reminder, the Stroop score is the difference in mean response latency to Stroop and control trials. Conceptually replicating Study 2, a Monitoring  $\times$  Time interaction emerged,  $F(1, 42) = 5.64, p = .02, \eta_p^2 = .12$ . As can be seen on the right half of Figure 2, participants who were monitoring their speech for content to conceal were more depleted than those for whom monitoring was not required. Conceptually replicating Study 3, the Alteration  $\times$  Time interaction was non-significant,  $F < 1, \eta_p^2 = .01$ . Furthermore, showing that the effect of monitoring was not exacerbated when alteration was also required, the Monitoring  $\times$  Alteration  $\times$  Time interaction was non-significant,  $F < 1, \eta_p^2 = .00$ . In other words, it did not matter whether participants were concealing the commonly-uttered words “don’t” and “very” or the never-uttered words “breakfast” and “therefore”; evidence of depletion was the same. Altering one’s speech was not sufficient to prompt depletion (in a non-concealment text), and it did not enhance depletion in the context of concealment.

One advantageous feature of the Stroop task is it permits us to decompose the Stroop effect into trials that require regulatory



**Figure 2.** Study 4: The left half depicts the change in Stroop effect (Stroop trials minus control trials) across time. The right half graphs the change in Stroop trials only across time. We created difference scores in the way depicted (Time 1 – Time 2) so that, like in the other studies, lower scores indicate self-regulatory impairment, and higher scores indicate the maintenance of greater self-regulatory strength. Note that bars are positive overall on account of a practice effect between the first and second completion of the task (Dewitte, Bruyneel, & Geyskens, 2009).

resources (the Stroop word trials) versus those that do not (the control character string trials). According to our logic, the impact of vigilance on the Stroop effect should have been driven by its impact on the Stroop trials. We would not expect an impact on the control trials. To test whether this more specific pattern of results held, we conducted analogous three-way ANOVAs on the Stroop trials and the control trials separately. Looking merely at the Stroop trials, the same Monitoring  $\times$  Time interaction emerges,  $F(1, 42) = 5.66$ ,  $p = .02$ ,  $\eta_p^2 = .12$  (see Figure 2). As with the overall Stroop effect, the Alteration  $\times$  Time and the Monitoring  $\times$  Alteration  $\times$  Time interactions were non-significant,  $F_s < 1$ ,  $\eta_p^2_s = .00$ . Showing that the effect of monitoring was specific to the Stroop trials, none of these effects were significant on the control trials,  $F_s < 1$ ,  $\eta_p^2_s < .03$ .

These findings demonstrate that monitoring is indeed responsible for the depleting effects of concealment, and these effects hold just as strongly when alteration is required as when it is not. By moving to the more pallid content in the present paradigm, monitoring and alteration were operationalized in more parallel ways more easily. For example, both the monitoring only and the alteration only conditions were defined by instructions of whether to conceal or say the same two words. The effect of monitoring reinforces that it is a vigilant internal monitor on the lookout for content to conceal that was depleting. Merely trying to alter one's speech, without a need to engage in task monitoring for content to inhibit, was not similarly depleting. Furthermore, depletion follows not merely from concealing highly personal content (i.e., one's sexual orientation) but exists as a consequence of concealing even mundane content.

### Do Concealment Effects Instead Stem From Anxiety or Discomfort?

We have argued that the taxing nature of concealment was due to the demands of monitoring for content to inhibit. Instead, it seemed possible that our effects could have stemmed from anxiety. We had this concern especially for Studies 1–3, in which participants who were concealing their sexual orientation may have been worried that their evasive language signaled that they were a member of a stigmatized group. To address this alternative explanation, we relied on both self-rated and confederate-rated measures of anxiety. In each study, the confederate coded the participant on three dimensions: uncomfortable, conversationally disfluent, and nervous. Responses were provided on scales ranging from 1 to 8, and were averaged to create discomfort composites ( $.79 < \alpha_s < .92$ ). At the end of each study, participants indicated whether they

felt at ease (Studies 1–3) and comfortable (Studies 1–4) during the interview.

In no case did depleted versus non-depleted participants significantly differ in confederate-rated discomfort. For only one measure in one study did participants differ in their self-ratings: Participants in the control (non-depleted) condition reported finding the interview more uncomfortable in Study 1 ( $M = 4.52$ ) than did those in the conceal condition ( $M = 3.30$ ),  $t(64) = 2.25$ ,  $p = .03$ ,  $d = 0.56$ . The direction of this one significant effect suggested that those concealing their sexual orientation were, if anything, less uncomfortable. This, of course, went against the direction of our concern. Although the means suggested relatively low discomfort overall, it is possible that conceal (monitoring + alteration) participants (in Study 1) were more comfortable because they knew they did not have to reveal anything too personal about themselves. Given this finding did not replicate in the other studies, we hesitate to focus on it. Nonetheless, these self-ratings of discomfort did not predict the effects on block-counting,  $r(62) = .12$ ,  $p > .34$ .

### General Discussion

After just 10 min of concealment during a casual interview, participants showed significant cognitive, interpersonal, and physical deficits. Following concealment, people evidenced depletion, showing reduced spatial intelligence (Study 1), politeness in responding to an annoying e-mail (Study 2), physical stamina (Study 3), and Stroop task performance (Study 4). These depletion effects emerged when participants were merely monitoring for content to inhibit, even when actual speech alteration was not needed (see Table 2). The actual alteration of one's speech was neither a necessary condition for nor a contributor to the observed effects. Beyond documenting that brief attempts at concealment are depleting, these findings represent—to our knowledge—the first effort to assess which aspect of an act of self-regulation, monitoring or alteration, is depleting.

One important question for future research is whether our effects stemming from monitoring versus alteration can be extended to understand other sources of self-regulatory depletion. Consider another form of taxing self-regulation examined in previous research: attempts to suppress facial displays of emotion (Muraven et al., 1998; Trougakos, Jackson, & Beal, 2011). One must *monitor* one's facial expression so as to avoid displaying emotion, and then at times *alter* one's facial behavior when one detects that one may be about to display emotion. Thus, an instruction to keep one's face stolid during a particularly humorous movie clip would re-

Table 2  
Summary of Studies

Study	Measure	Condition		
		Monitoring + Alteration	Monitoring only	Alteration only
1	Spatial intelligence	Impaired		
2	Restraint over e-mail	Impaired	Impaired	
3	Physical strength	Impaired		Unaffected
4	Stroop interference	Impaired	Impaired	Unaffected

*Note.* Monitoring refers to monitoring for content to conceal. Impaired and Unaffected refer to the influence of the specified experimental condition compared to the control condition.

quire both monitoring and alteration. If our basic findings generalize, then emotion suppression might be expected to hurt subsequent self-regulation even when the clip ends up not being humorous (meaning only monitoring with a preparation to inhibit would be required). In contrast, forcing some laughs to encourage an amateur stand-up comedian should not be too depleting.

In addition to suggesting new extensions and limits to depletion effects, these basic theoretical ideas offer advice on how to make tasks less depleting. In general, self-regulation may be less costly if it requires less monitoring to inhibit, but not necessarily less alteration. Keeping cigarettes or fatty foods out of the house may help self-regulators resist temptation not only because temptation is kept outside of arm's reach, but also because the absence of proximal temptations reduces the need to monitor urges that must be suppressed before the ice cream is on one's spoon. The monitoring that temptations' proximity demands may tax one's resources, making it more difficult to resist temptation as time goes on (see Vohs & Heatherton, 2000).

That said, we suspect that self-regulation domains may differ in the extent to which alteration is effortful. During concealment, one may be able to apply relatively simple or straightforward strategies to change one's spoken speech. In other contexts, alteration may be less straightforward and thus more taxing. For example, Vohs et al. (2005) found that it is depleting to present oneself in a particularly modest or self-enhancing way to a stranger or friend, respectively. Although presenting oneself in a modest way would seem to require effortful monitoring of one's speech for (self-enhancing) content to inhibit, it seems possible that the complementary self-presentation strategy—to present oneself in a self-enhancing light when it is unnatural to do so—may be taxing due to speech alteration instead of the burden of monitoring for modest content to edit out. Regardless of how future research resolves the more general question of what aspect of self-regulation is depleting, we hope the present article can serve as a helpful model for how experiments can tease apart the contributions of monitoring and alteration.

### Speech Suppression Versus Thought Suppression

The present research offers a new perspective on the pitfalls of concealment. Lane and Wegner (1995) showed that when keeping secrets, people try to suppress thoughts related to the secretive content. However, as Wegner's well-validated ironic process theory has argued, attempts to mentally suppress content frequently backfire, making that content more accessible (Wegner, 1992, 1994, 2009). And indeed, thoughts that one wants to keep suppressed may become hyperaccessible in one's mind (Lane & Wegner, 1995), which may lead to unintended utterances.

Regarding our participants asked to avoid revealing specified content, we had no reason to suspect that they attempted to rid this content from their thoughts. For example, we anticipated that participants in our first three studies would try to keep their sexual orientation in mind as they were vigilant to their imminent speech, making sure that none of this to-be-concealed content would be included. Consistent with this account, participants in Study 2 did not show evidence of an increase in the degree to which their sexual orientation thoughts were unintentional, which would have been a symptom of thought suppression. Furthermore, participants were generally successful at concealing this content, meaning there

was little evidence of making unintended utterances that a thought suppression strategy might prompt.

That said, we do not doubt that some individuals—for example, those who are highly troubled by their own sexual orientation—may try not only to hide their sexual orientation from others but to suppress the thought of it in themselves. For these people, sexual orientation may be in that class of thoughts that are so aversive that one would rather not even think about their orientation, much less discuss it with others. Lane and Wegner (1995) reported that, for students, academic failure and dying are the most-mentioned topics they try to suppress from their thoughts entirely. However, for many people—like those in our study—sexual orientation (or other to-be-concealed content) is not a threat that one prefers not to think about or acknowledge in the self, but is instead a piece of information that one strategically monitors to avoid the cost of disclosure. Even in the less intense context of our experiments, monitoring exacted a cost.

### Relevance to Concealable Stigma

In the present article, we set out to examine the consequences of concealment. Because we did not want to blur our study of concealment with an examination of stigma (which may be associated with self-regulatory deficits for other reasons), we included only heterosexual participants in our first three studies. In this way, we could examine how concealing an identity could be depleting without studying this in the context of stigma. Navigating stigma may itself be depleting, but concealment seems to exert its own depleting effect.

Past research has uncovered a variety of negative consequences experienced by gays and lesbians who conceal their sexual orientation but has focused on consequences for physical and mental health, instead of ability (Major & Ginzburg, 1999). Being open about one's sexual orientation has been associated with less anger, lower depression, and high self-esteem—at least in autonomy-supportive environments (Legate, Ryan, & Weinstein, 2012). Gay men who conceal their sexual orientation have been shown to have poorer mental health and mood disturbances (Miranda & Storms, 1989; Ross, 1990) and show more rapid progression of HIV (Cole, Kemeny, Taylor, & Visscher, 1996; Cole, Kemeny, Taylor, Visscher, & Fahey, 1996). The present research notes how sexual orientation concealment can produce more immediate cognitive, interpersonal, and physical impacts.

Although we have noted the benefits of studying our hypotheses with heterosexual participants, future research is needed to determine how these findings generalize to the everyday experience of gay men and lesbians who conceal their sexual orientation. Although practice with concealment could make it easier with time, the list of negative effects cited above makes clear that closeted gay men and lesbians are not immune from negative effects of concealment. Furthermore, when in previous research gay men and lesbians were asked to conceal their sexual orientation (but not when asked to conceal their extroversion), they showed a reduced willingness to help others, as though this secret-keeping imposed a burden on them (Slepian, Masicampo, Toosi, & Ambady, 2012). If their participants had more practice concealing their sexual orientation than their extroversion, it certainly did not immunize them from the burden of that secret. Similarly, it does not seem to be the mere novelty of the experimental instructions that made



them depleting. Adding in a lie to each response (Study 3) or adding in one of two specified words to each response (Study 4) are likely novel demands, but ones that were not depleting because (by our argument) they required speech alteration instead of monitoring for responses to inhibit. Finally, although our participants were willing to oblige to the instructions to conceal their sexual orientation, gay men and lesbians who conceal their identities are presumably even more invested in this concealment. As such, they may be even more vigilant monitors than those in the present studies. Thus, it is unclear how the present conclusions will be refined as they are examined in populations that may have more practice with, but also more anxiety about the consequences of failing at, concealment.

In these times of social change, some readers may wonder just how common it is for gays and lesbians to conceal their identities, and thus how relevant these findings would even be to that population. According to the Human Rights Campaign Foundation's (2010) report, 51% of gays and lesbians were not "out" to most people in their workplace. In 1996, the U.S. Senate failed to pass by a single vote an Employment Non-Discrimination Act (ENDA) that would have protected gays and lesbians from workplace discrimination. Clearly more research on this population is needed, for the present article suggests that the wisdom of ENDA and related policies may need to be debated not merely through a moral lens, but with an understanding of the effects of identity concealment on one's cognitive, physical, and interpersonal performance.

Even though the threat of prejudice is one reason people engage in concealment, it is important to note that our findings have little relation to past work on links between intergroup prejudice and regulatory depletion. Shelton, Richeson, and their colleagues have shown that intergroup relations can be depleting—both for those who hold implicit prejudice themselves (Richeson & Shelton, 2003; Richeson & Trawalter, 2005) and those who detect the potential presence of prejudice in others (Salvatore & Shelton, 2007). Unlike this previous work, the present research does not examine a consequence of prejudice or stigma, but instead the issue of concealment more broadly.

## Conclusion

Concealment can be exhausting. Not only does a lack of openness exact a cost on one's relationships, but it can exact a cost on one's self. Most simply, this research adds concealment to a list of acts that impair one's subsequent ability to exert self-control. However, by decomposing concealment into two component requirements—monitoring and alteration—we were able to better understand when and why concealment is depleting. In this way, we offer a qualitatively new answer to Inzlicht and Schemichel's (2012) call for research that moves beyond merely demonstrating ego depletion to understanding why it emerges. To date, these (limited) efforts have been in the service of one question: What happens to a person after they have exerted self-control at Time 1 that makes it more difficult to exert self-control at Time 2? The present studies show the value in investigating the complementary question: What aspect of exerting self-control at Time 1 is responsible for the diminished self-control at Time 2? In the case of concealment, constant monitoring for content to inhibit—not actual alteration of one's speech—is that depleting aspect. Future

research will uncover whether monitoring is what is depleting about self-control more generally.

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## Appendix A

### Interview Questions Used in Studies 1, 2 (Control and Conceal [Monitoring + Alteration] Conditions), and 3

1. What is most different between your life at [this university] and your life before you came to [this university]?
2. If you were a parent, what sorts of restrictions would you put on your child in terms of their dating life?
3. Compared to most people, how frequently do you go out with your friends or, if relevant, your significant other?
4. As you look into your future, how much of a challenge do you think it will be to strike a balance between your work life and your relationship life?
5. Would you be open to adopting children? Why or why not?
6. What sort of activities do you like to do on a first date?
7. Think of your ideal dating partner. In what sorts of domains do you think that you would want the two of you to be similar? In what sorts of ways do you think it would benefit you to be different?

(Appendices continue)



## Appendix B

### Interview Questions Used in Study 2 (Monitoring Only Condition) and Study 4

1. What is most different between your life at [this university] and your life before you came to [this university]?
2. How does your own approach to classwork and studying for exams differ from that of your peers?
3. As you look into your future, how do you think the skills you are acquiring here at [this university] will be helpful to your career in the future?
4. We all have friends that treat us well, but sometimes are jerks to other people. Does the way these people treat other people influence your own friendship? Are there certain lines that your friends might cross in how they treat other people that would make you reconsider your friendship?
5. Some colleges have a very wide core curriculum, requiring people to take basic, introductory classes in a wide variety of departments. Other colleges allow students to specialize more quickly, giving them a chance to learn a smaller number of subjects in greater depth. If you were going to design a university, which model would you advocate?
6. Different people approach vacations differently. What sort of activities do you like to do when you go home for school breaks?
7. Think about what your ideal academic advisor would be like. In what ways would you want the two of you to be similar? In what way would you want the two of you to be different?

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