

The Role of Need Satisfaction in Self-Concealment and Well-Being

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Abstract

The present research tests a model derived from self-determination theory to explain why self-concealment (the tendency to keep distressing personal information secret) is associated with negative well-being outcomes. Two studies tested a model in which self-concealment predicts the thwarting of basic needs for autonomy, competence, and relatedness, which then results in negative psychological outcomes. Study 1 involved a cross-sectional design. Structural equation modeling analyses revealed that the model provided an acceptable fit to the data. Study 2 involved a multilevel design. Participants completed daily measures of self-concealment, need satisfaction, and well-being over 16 days. Results supported the proposed mediation model. Furthermore, the associations between daily self-concealment, daily need satisfaction, and daily well-being were independent of trait self-concealment. Overall, the findings suggest that concealing personal distressing information is detrimental to the satisfaction of basic psychological needs, which in turn predicts negative well-being.

Keywords

self-concealment, self-determination, need satisfaction, well-being, secrecy

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People vary in the extent to which they hide negative information about themselves from others. This tendency to conceal distressing or negative personal information from others is defined as *self-concealment* (Larson & Chastain, 1990). According to Larson and Chastain (1990), the concealed personal information has three characteristics—it is private and personal, consciously accessible, and actively kept hidden. Hence, self-concealment involves a conscious and active process to hide negative personal information.

Research has shown that self-concealment is associated with negative physiological and psychological outcomes such as anxiety and depression (Kahn & Hessling, 2001; Kelly & Achter, 1995), self-reported physical symptoms (Cepeda-Benito & Short, 1998; Larson & Chastain, 1990), rumination (King, Emmons, & Woodley, 1992), and loneliness (Cramer & Lake, 1998). Furthermore, longitudinal studies suggest that self-concealment leads to poor well-being. For instance, in a 5-year study of 222 homosexual men, it was found that incidence of cancer and infectious diseases, such as bronchitis, sinusitis, and tuberculosis, increased in direct proportion to the degree of concealment of homosexual identity, controlling for demographic characteristics, health-relevant behaviors (e.g., smoking, drinking), social desirability, negative affectivity, anxiety, depression, and repressive coping (Cole, Kemeny, Taylor, & Visscher, 1996). Similarly, concealing one's abortion from others predicted

an increase in psychological distress over a 2-year period (Major & Gramzow, 1999).

Although the relation between self-concealment and negative psychological outcomes is well established, the mechanisms behind this association are not well understood. To examine how self-concealment is associated with negative outcomes, we tested a model based on self-determination theory (SDT; Deci & Ryan, 1985, 2000). More specifically, we suggest that self-concealment is associated with psychological problems because it is detrimental to the satisfaction of basic psychological needs for autonomy, competence, and relatedness.

Self-Concealment and Well-Being

Researchers have suggested several different models to explain why self-concealment is associated with poor well-being. Kelly (2002) summarized three models and labeled them the *inhibition model*, the *preoccupation model*, and the *self-perception model*. According to the inhibition model,

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not talking about certain psychological experiences is a form of active inhibition (Pennebaker, 1989). It takes physiological effort to consciously restrain thoughts, emotions, and behaviors. Moreover, this physiological work acts as a long-term, low-level stressor. Over time, these stressors on the body accumulate, leading to physiological and psychological symptoms. Research has found some support for the inhibition model (see Pennebaker, 1989, for a review), and shown that disclosing traumatic experiences leads to better health, whereas inhibiting them is associated with negative health outcomes.

The preoccupation model (Lane & Wegner, 1995) is a cognitive explanation based on the thought-suppression paradigm (Wegner, 1992). According to this model, secrecy requires thought suppression, which necessitates cognitive effort. Furthermore, thought suppression has the paradoxical effect of making the suppressed thoughts more intrusive or hyperaccessible. This leads to further attempts at thought suppression, which results in a vicious cycle of thought suppression and thought intrusion. This cycle puts the secret keeper in a state of constant mental unrest and obsessive preoccupation that can have negative health consequences (Lane & Wegner, 1995). Some studies have supported the preoccupation model (e.g., Major & Gramzow, 1999; Smart & Wegner, 1999). Although the preoccupation model provides a cognitive explanation for how people can become preoccupied with thoughts they are trying to conceal, it does not explain how this preoccupation results in negative outcomes.

Other researchers have suggested a model based on self-perception theory (Bem, 1972) to explain the association between self-concealment and negative psychological outcomes (Derlega, Metts, Petronio, & Margulis, 1993). According to the self-perception model, self-concealment leads to a self-perception process (e.g., "Because I cannot talk about it, the information I am concealing must be really shameful"), resulting in negative attributions about the self, as well as feelings of shame and guilt. This idea has not been tested directly; however, some findings have provided indirect support. For instance, self-concealment was moderately correlated with low self-esteem and shyness (Ichiyama et al., 1993). Similarly, in a diary study over 11 days, researchers found that students with concealable stigmas (e.g., homosexuality, bulimia, family income less than \$20,000) reported lower self-esteem and more negative affect than did students with no stigmas or students with visible stigmas (Frible, Platt, & Hoey, 1998).

Kelly (2002) made a distinction between the act of secret keeping and having an inhibited personality. She suggested that the process of secret keeping is not problematic but that individuals with inhibited personalities may be more vulnerable to developing health problems. Self-concealment reflects an inhibited personality; hence, it is associated with negative psychological and physiological outcomes. Some studies supported this idea and suggested that secret keeping

is not detrimental to well-being, whereas self-concealment is (Kelly, 1998; Kelly & Yip, 2006). Although separating the effects of secret keeping from self-concealment can prove useful, this distinction still does not explain the process by which self-concealment (or having an inhibited personality) is associated with negative outcomes. Furthermore, we think that even people who do not have inhibited personalities or who are not self-concealers will also experience negative consequences when they self-conceal. Hence, we suggest that the *process* of self-concealment is also problematic. We turn to SDT and its concept of basic psychological needs for a potential explanation.

A Self-Determination Model

According to SDT (Deci & Ryan, 1985, 2000), people have basic psychological needs for autonomy, competence, and relatedness that are essential for personal growth, integrity, and psychological health. Autonomy refers to engaging in volitional, self-determined actions. Activities that fulfill autonomy needs are endorsed by one's true self; they are not controlling or imposed. Competence refers to feeling effective, capable, and optimally challenged. Relatedness refers to having a sense of belongingness, meaning, and feeling genuinely connected to others (Ryan & Deci, 2002). SDT posits that satisfaction of autonomy, competence, and relatedness needs is essential for psychological health. Satisfying only one or two of these basic needs is not sufficient; fulfillment of all three needs is required for optimal psychological health and well-being. When any of these needs are thwarted or neglected, negative psychological outcomes follow (Deci & Ryan, 2000).

Several studies have supported SDT's prediction that unfulfilled needs result in lower well-being. For instance, in two diary studies, people who reported higher satisfaction of their basic needs also reported higher well-being, both in person-level and day-level analyses (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996). That is, in addition to a trait-level association between basic needs and well-being, the daily satisfaction of autonomy, competence, and relatedness was associated with higher daily well-being. The relation between need satisfaction and well-being has also been found in organizational settings (Baard, Deci, & Ryan, 2004; Deci et al., 2001; Ilardi, Leone, Kasser, & Ryan, 1993) and romantic relationships (Patrick, Knee, Canevello, & Lonsbary, 2007).

We suggest that self-concealment is associated with lower well-being because self-concealers are less likely to fulfill their autonomy, competence, and relatedness needs. First, self-concealment is detrimental to the satisfaction of autonomy because self-concealers constantly monitor and suppress their thoughts (Lane & Wegner, 1995), and presumably their actions, to avoid revealing their secrets. In that sense, they feel controlled (i.e., not being able to stop thought intrusion) rather than autonomous, at the cognitive level. Similarly,

they are also likely to feel controlled in their behaviors as a result of this process. If these intrusive thoughts cannot be suppressed cognitively, at a minimum, they should not be expressed outwardly. Therefore, people begin to monitor the things they say, the conversations they have, and the behaviors they display, especially when they perceive that their secrets may be revealed. Eventually, these individuals will start feeling controlled in their behaviors because of their secrets. Furthermore, some secrets are not merely events that happened in the past but are instead an active situation that can be revealed if the secret keeper is not careful. For instance, consider a businesswoman who is hiding her gambling addiction from her husband. This person would be cautious in her interactions with her husband. She would try to avoid money-related discussions. She may even pretend that her business is not going well to avoid making her husband suspicious. All of these behaviors would be inauthentic, stemming from the pressure to conceal her addiction. Thus, the individual would feel constrained and would not be able to act autonomously, leading to unmet autonomy needs.

Second, self-concealment may thwart the satisfaction of competence needs because self-concealers have limited opportunities to receive validation for their distressing qualities. Others can only validate and support our imperfect qualities if they are aware of them, and this affirmation, appraisal, and acceptance from close others is an important part of feeling competent and validated. When one holds onto and hides one's weaknesses, one forgoes opportunities for others to accept those self-aspects and the chance to feel better about those qualities. Also, self-concealers are more likely to have lower feelings of self-worth as a result of self-perception processes (Derlega et al., 1993; Frable et al., 1998). They might evaluate their distressing qualities in a more negative way, simply because they cannot disclose them.

Consider the following example: Mary is an infertile woman who is concealing her infertility from her friends. She feels uncomfortable whenever one of her friends mentions babies or children. In such situations, Mary may change the subject; otherwise, she must invent creative answers to fend off her friends' questions. She wants to have a baby, but she feels that she is helpless. Her infertility is constantly on her mind. She also has "paranoid social cognitions" (Kramer, 1998), that is, unwarranted fears that others will blame her for her difficulties or evaluate her negatively if she reveals the information. As a result of these self-perception and reflected appraisal processes, she evaluates herself negatively and thinks she is incompetent. This experience would differ from that of Jane, an infertile woman who decided to be open about her condition. When Jane revealed her problem to her friends, she realized that her fears were unsubstantiated. In fact, her friends were very supportive of her. Furthermore, Jane has accepted her condition. She also wants to have a baby, but she does not feel helpless. She is looking for alternative solutions and is considering adoption.

In this hypothetical scenario, both Mary and Jane are incapable of having children, but Mary's decision to keep it a secret makes her infertility more salient to her. Because of its salience and its importance to her identity, she constantly evaluates herself negatively and feels helpless and incompetent. In contrast, Jane's decision to reveal her condition relieved all of her pressures, and she is looking for ways to improve her situation instead of feeling helpless and incompetent. In sum, concealing negative aspects of one's self may lead to evaluating those aspects much more negatively and feeling incompetent.

Finally, self-concealment may be detrimental to the satisfaction of relatedness needs. Relatedness involves feeling connected to others in a trusting and supportive way. However, self-concealers are less likely to self-disclose (Kahn & Hessling, 2001; Larson & Chastain, 1990), receive social support (Cepeda-Benito & Short, 1998; Kelly & Achter, 1995), and develop secure attachments (Lopez, Mitchell, & Gormley, 2002). For example, Mark, a high school student, has a brother with a mental disability. He has to take care of his brother on certain weekdays. He believes that if his friends knew about his brother's condition, they might behave differently toward him. Therefore, he conceals this information from his friends. Although he has several close friends, he feels that they do not truly know him and does not feel genuinely connected to them. As in this example, we suggest that people who self-conceal would be less likely to feel connected to others in a trusting, supportive, and genuine way.

We have discussed the association of self-concealment with each need for theoretical purposes. It is important to note that we do not suggest self-concealment would predict each need controlling for the other two needs. Past research treated autonomy, competence, and relatedness either as separate constructs (Reis et al., 2000) or as related constructs of a general need satisfaction latent variable (Baard et al., 2004; Deci et al., 2001). Regardless of their dependence or independence, we suggest that self-concealment will be associated with an overall reduction in autonomy, competence, and relatedness needs, which then would lead to negative outcomes. That is, self-concealment would affect the three needs similarly. Thus, we treated the three needs as a general variable.

The Current Research

The primary goal of this research was to test a model in which self-concealment predicts thwarted basic psychological needs, which then results in lower well-being. We tested this model in two studies. Study 1 utilized a cross-sectional survey to measure self-concealment, basic need satisfaction, and several well-being outcomes. We expected that the relation between self-concealment and well-being would be partially mediated by basic psychological needs. In Study 2, we conducted a more rigorous test of this effect with a

diary-recording procedure over 16 days. We expected that daily self-concealment would predict lower daily well-being and that this effect would be mediated by one's daily perceptions of need satisfaction.

A second goal of this research was to examine the unique association of self-concealment beyond that of self-disclosure. Self-concealment is not simply a lack of self-disclosure. For instance, telling a person one recently met that one has two siblings would be an act of self-disclosure. However, not telling this information would not be an act of self-concealment because the information is neither negative nor distressing, and one would not be actively trying to keep it hidden. Although past research has shown that self-disclosure and self-concealment are related but unique (Larson & Chastain, 1990), more empirical evidence is needed. On the other hand, distress disclosure was conceptualized as a subset of self-disclosure that partially overlaps with self-concealment (Kahn & Hessling, 2001). As in the previous example, telling a new acquaintance that one is having difficulties in one's life would be an act of distress disclosure. However, not telling this information may or may not be an act of self-concealment, depending on whether the person is actively trying to keep it concealed. Therefore, distress disclosure is conceptually more similar to self-concealment than is self-disclosure. Thus, we included a measure of distress disclosure instead of self-disclosure in our first study to test the unique effect of self-concealment beyond that of distress disclosure.

A third goal of this research was to investigate whether the negative outcomes associated with self-concealment are only personality effects (Kelly & Yip, 2006) or are also a consequence of the process of self-concealment, independent of personality. Kelly and Yip (2006) found that keeping a major secret predicted lower symptomatology after nine weeks, whereas trait self-concealment predicted greater symptomatology after nine weeks. They concluded that the process of secret keeping is not problematic; rather, the findings of the studies that link keeping a major secret to negative outcomes (e.g., Cole et al., 1996) are confounded by personality variables, such as self-concealment, that reflect an inhibited personality. We suggest that independent of personality effects, the process is detrimental to the satisfaction of basic needs and eventually, to well-being. Thus, we tested this hypothesis in Study 2 with a multilevel design (days nested within person), which allowed us to examine daily effects (within-person effects) and personality effects (between-person effects) independently.

Study 1

Method

Participants. One hundred and eighty students (167 female) from undergraduate psychology classes participated in exchange for extra credit. Participants' ages ranged from 18 to 59

($M = 23.89$, $SD = 6.83$). The sample was diverse, with participants identifying as Caucasian (31%), African heritage (20%), Asian heritage (21%), Hispanic/Latin heritage (19%), and Other (9%).

Procedure. Participants completed a one-time survey containing the measures. They were permitted to complete either an online version or a printed version of the survey, according to their own preference. The content was the same in both versions. Sixty-six percent of the participants elected to complete the online version.¹

Measures

Self-concealment. Self-concealment was assessed by the 10-item Self-Concealment Scale (Larson & Chastain, 1990), which measures the degree to which one tends to conceal negative personal information, using a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include, "There are lots of things about me that I keep to myself" and "I'm often afraid I'll reveal something I don't want to." Internal reliability (Cronbach's alpha) in this study was .87.

Self-disclosure. Self-concealment involves hiding negative, unpleasant, or stressful things about oneself, so we used a measure that assesses self-disclosure about stressful topics. This allowed us a more stringent control variable, as self-concealment would overlap more with distress disclosure than general self-disclosure. Thus, self-disclosure was assessed by the 12-item Distress Disclosure Index (Kahn & Hessling, 2001). Participants rated statements such as, "I try to find people to talk with about my problems" and "When I am in a bad mood, I talk about it with my friends" on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Internal reliability was .92.

General need satisfaction. Need satisfaction was assessed by the 21-item General Need Satisfaction scale (Deci & Ryan, 2000), which measures satisfaction of autonomy, competence, and relatedness in the general domain of everyday life. Each subscale consisted of seven items. Respondents rated statements such as, "I feel like I am free to decide for myself how to live my life," "Most days I feel a sense of accomplishment from what I do," and "People in my life care about me" on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Each subscale can be scored separately or combined into a general need satisfaction score. Internal reliability was .89.

Well-Being Measures

A well-being variable was created by using a composite of seven constructs involving anxiety, symptoms, mental health, perceived stress, self-esteem, life satisfaction, and subjective vitality. These variables were chosen to measure both physiological (e.g., symptoms) and psychological well-being, and similar constructs have been used in past research to assess well-being or psychological adjustment (e.g., Kahn & Hessling, 2001; Reis et al., 2000; Sheldon et al., 1996).

Anxiety. Trait anxiety was assessed by the 20-item State-Trait Anxiety Inventory–Trait component (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), which measures trait anxiety using a scale of 1 (*almost never*) to 4 (*almost always*). Respondents indicated how they generally feel by rating statements such as, “I feel nervous and restless” and “I am a steady person.” Internal reliability was .94.

Self-reported symptoms. Symptoms were assessed by the short form of the Brief Symptom Inventory (Derogatis, 2000). The 18-item scale measures the extent to which one has experienced anxiety, depression, and physical symptoms (e.g., headaches, upset stomach, dizziness) during the last 2 weeks, using a scale of 0 (*not at all*) to 4 (*extremely*). For example, participants responded to questions such as, “During the last two weeks, how much were you distressed by nausea or upset stomach?” Internal reliability was .92.

Mental health. Mental health was measured by the five-item Mental Health Inventory (Stewart, Hays, & Ware, 1998). Participants rated statements such as, “How often have you been a very nervous person?” and “How often have you felt downhearted and blue?” on a scale of 1 (*none of the time*) to 6 (*all of the time*). Internal reliability was .83.

Perceived stress. Perceived stress was assessed by the 10-item Perceived Stress Scale (Cohen & Williamson, 1988), which measures how frequently respondents felt stressed during the last two weeks. Using a scale of 0 (*never*) to 4 (*very often*), participants indicated how often they “felt difficulties were piling up so high that they could not overcome them” or “felt nervous and stressed.” Internal reliability was .88.

Self-esteem. Self-esteem was assessed by the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Participants rated items such as, “I am able to do things as well as most people,” using a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Internal reliability was .91.

Life satisfaction. Life satisfaction was assessed by the five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). Participants rated items such as, “The conditions of my life are excellent” and “I am satisfied with my life” on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Internal reliability was .91.

Subjective vitality. Subjective vitality was assessed by the Subjective Vitality Scale (Ryan & Frederick, 1997). Using a scale of 1 (*strongly disagree*) to 7 (*strongly agree*), participants rated statements such as, “I feel alive and vital” and “I look forward to each new day.” Internal reliability was .92.

Results and Discussion

A structural model was created to test the hypothesis that the relation between self-concealment and well-being would be mediated by need satisfaction. The predictors were self-concealment and distress disclosure, the latter being included as a control variable. Following the precedent set by previous research on SDT, the three subscales of the General Need

Satisfaction scale were used as indicators of a general need satisfaction latent variable (e.g., Baard et al., 2004; Deci et al., 2001; Hagger, Chatzisarantis, & Harris, 2006). Anxiety, physical symptoms, mental health, perceived stress, self-esteem, life satisfaction, and vitality were used as indicators of the outcome, an overall well-being latent variable. Negative indicators of well-being (e.g., anxiety) were reverse scored so that they would load positively on the latent well-being variable. Listwise deletion was conducted before conducting structural equation modeling analyses. The final data set consisted of 174 participants. Table 1 provides means, standard deviations, and zero-order correlations among the variables.

The model was tested using Mplus software (Muthén & Muthén, 2001). To evaluate the model’s goodness of fit, we examined the comparative fit index (CFI; Bentler, 1990), the Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993). CFI and TLI values above .90 reflect good fit, whereas RMSEA values below .05 indicate good fit, and values greater than .10 indicate poor fit (Kline, 1998). In the present research, findings suggested that the model adequately fit the data, $\chi^2(50) = 104.8, p < .001, RMSEA = .08, CFI = .96, TLI = .95$.

The structural model is presented in Figure 1, along with standardized factor loadings and path coefficients. Self-concealment was negatively related to well-being and need satisfaction, whereas need satisfaction was positively related to well-being. As expected, self-concealment predicted lower need satisfaction, which in turn predicted lower well-being. Also, self-concealment had a direct negative association with well-being, and the relation between self-concealment and well-being was partially mediated by need satisfaction. Furthermore, 78% of the variance in the outcome (i.e., well-being) was accounted for by the hypothesized associations. These findings support the self-determination model of self-concealment.

Second, self-concealment and distress disclosure showed a moderate negative correlation. However, self-concealment, independent of distress disclosure, had a direct association with well-being, as well as an indirect association via need satisfaction. Distress disclosure, on the other hand, negatively predicted need satisfaction but was not directly associated with well-being. These findings provide empirical evidence for the distinction between self-concealment and distress disclosure and suggest that self-concealment is distinct from self-disclosure even when disclosure is restricted to distress.

Finally, to examine whether self-concealment is similarly related to all three needs, the same model was tested, using the three needs as separate constructs instead of combining them into a general need satisfaction latent variable. We also allowed residual covariances between the three needs because of their high intercorrelations. This model did not provide a better fit, $\Delta\chi^2(6) = 10.31, p = .11, ns$. Results

Table 1. Zero-Order Correlations for Study 1

	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-concealment	—											
2. Distress disclosure	-.46	—										
3. Autonomy	-.42	.38	—									
4. Competence	-.44	.37	.65	—								
5. Relatedness	-.49	.44	.65	.66	—							
6. Mental health	-.51	.33	.53	.58	.55	—						
7. Self-esteem	-.54	.36	.62	.76	.61	.66	—					
8. Vitality	-.49	.32	.52	.66	.55	.66	.69	—				
9. Life satisfaction	-.50	.33	.47	.57	.50	.61	.66	.62	—			
10. Stress	.46	-.28	-.55	-.53	-.45	-.68	-.62	-.60	-.58	—		
11. Anxiety	.55	-.36	-.63	-.68	-.58	-.78	-.80	-.75	-.67	.79	—	
12. Symptoms	.42	-.28	-.57	-.50	-.47	-.72	-.66	-.56	-.51	.69	.71	—
M	2.65	4.51	5.05	5.23	5.47	4.38	4.04	4.74	4.49	1.82	2.01	0.78
SD	0.82	1.23	0.85	1.00	0.94	0.81	0.82	1.34	1.52	0.76	0.59	0.66

All correlations are significant at $p < .001$.

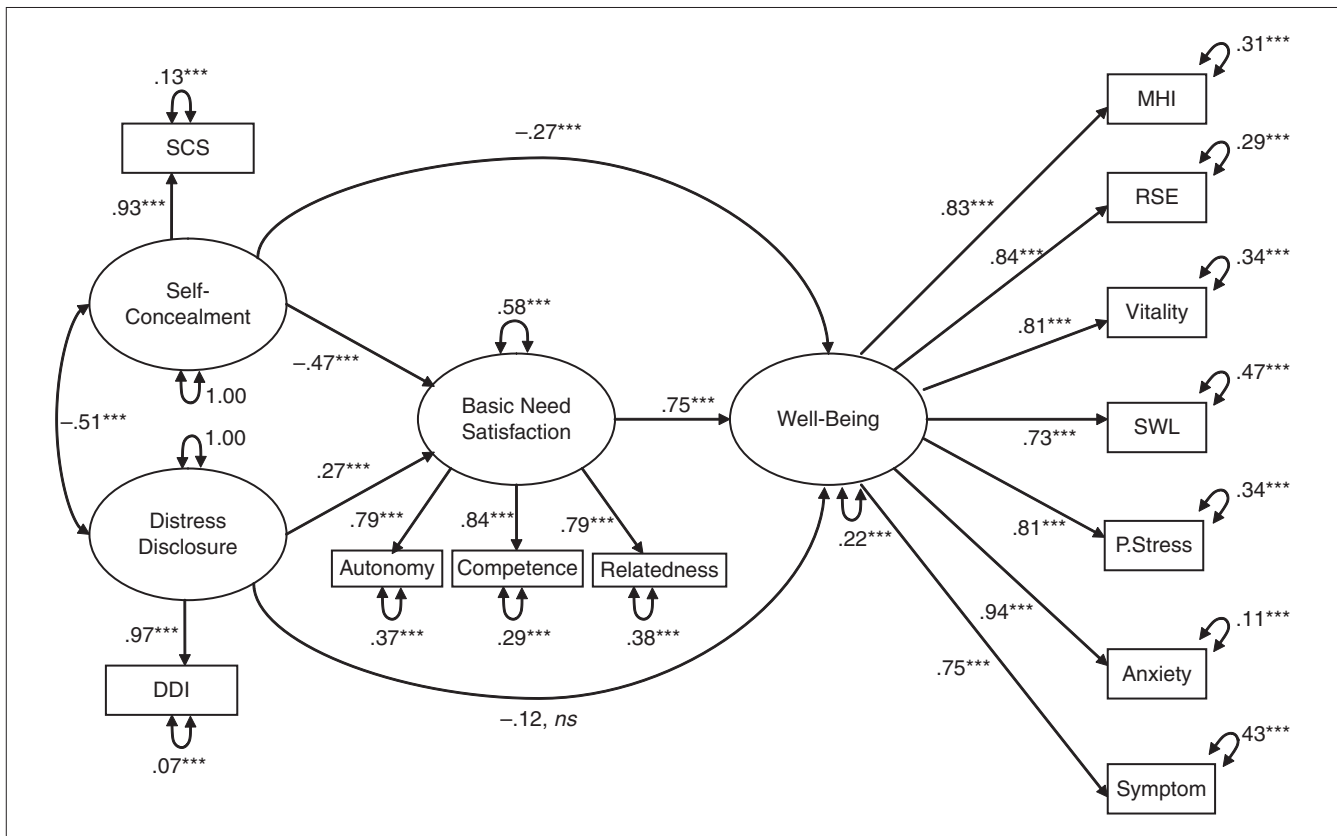


Figure 1. Self-concealment predicting well-being with basic need satisfaction as the mediator (Study 1)
 *** $p < .001$.

showed that self-concealment significantly predicted autonomy, competence, and relatedness needs ($\beta s = -.35, -.39,$ and $-.41$, respectively, all $p s < .001$) and had a direct association with well-being ($\beta = -.37, p < .001$). Furthermore, both

autonomy ($\beta = .25, p < .001$), and competence ($\beta = .39, p < .001$) were significantly related to well-being. On the other hand, the association between relatedness and well-being was not significant ($\beta = .04, ns$). This may be due to high

overlap between the basic needs measures, or the effect of relatedness on well-being might be mediated by the other needs.

Between-person analyses in Study 1 indicated that self-concealment was negatively associated with well-being and that this association was mediated by unfulfilled basic psychological needs. Because of the cross-sectional nature of the study, the findings cannot support causality. However, our argument can be strengthened if the findings of Study 1 are replicated using a different methodology.

Furthermore, Kelly and Yip (2006) argued that self-concealment is related to negative outcomes because it reflects an inhibited personality. They suggested that the process of keeping a major secret is not necessarily problematic and advised researchers to control for trait effects when investigating secret-keeping processes. Although our model is about self-concealment, it is still a process model rather than a trait model. We suggest that self-concealment is associated with negative outcomes because *the act of self-concealment* hinders the satisfaction of basic psychological needs, as described earlier. In other words, even people who are not high in trait self-concealment would experience negative consequences when they self-conceal.

Study 2

In Study 2, we tested the proposed model with a longitudinal method, which allowed us to assess within-person daily variations. We hypothesized that daily self-concealment would covary negatively with daily need satisfaction and daily well-being, independent of trait self-concealment. Furthermore, daily need satisfaction would covary positively with daily well-being and mediate the relationship between daily self-concealment and daily well-being. Study 1 showed that self-concealment is different and independent from lack of distress disclosure; thus, we did not include distress disclosure in Study 2.

The design of the study was such that days were nested within persons. Multilevel designs have various strengths: They allow the research question to be investigated at different levels of analysis simultaneously by separating the within-person and between-person effects. The within-person level (i.e., day level) addresses whether daily self-concealment covaries negatively with daily well-being; that is, is well-being lower on the days in which any given person reports more self-concealment? At the between-person level (i.e., person level), we can explore whether people who are high on trait self-concealment have lower daily well-being on average. Furthermore, cross-level interaction effects can also be examined, such as whether daily covariation between self-concealment and well-being changes, depending on individual trait self-concealment. In sum, we hypothesized that daily self-concealment would predict lower daily need satisfaction, which would in turn predict lower daily well-being.

Method

Participants. Eighty-four students (71 female) from undergraduate psychology classes participated in this study in exchange for extra credit. Participants were required to have regular, easy access to a computer with Internet capabilities. They were ineligible for Study 2 if they had participated in Study 1. Participants' ages ranged from 18 to 49 ($M = 24.11$, $SD = 6.23$). Participants reported diverse ethnicities: African heritage (26%), Asian heritage (23%), Caucasian (23%), Hispanic/Latin heritage (26%), and Other (2%).

Procedure. Full completion of the study involved three phases: a paper-and-pencil questionnaire packet, an orientation session in the laboratory, and 16 days of interval-contingent diary records. The daily records were administered online via a data collection Web site.

First, participants completed an initial battery of questionnaires on their own time. They submitted the questionnaires when they attended a group orientation session, in which research assistants explained the procedure for completing interval-contingent diary records. After explaining the diary record procedure, the research assistants informed the participants that anyone who felt unable to complete the remainder of the study could leave then and experience no penalty. None of the participants chose to leave. The research assistants then allowed participants to sign up for daily telephone, e-mail, and text message reminders if they wished.

Participants began completing online diary records the day after their orientation session. They were responsible for submitting diary records for 16 consecutive days, completing a record before going to bed each night. Participants who forgot to complete a record before going to bed were allowed to submit their record until noon of the following day. As a reminder, the research assistants contacted participants when they missed more than 2 consecutive days of records.

Day-Level Measures

The diary record forms assessed daily self-concealment, daily need satisfaction, and daily well-being. The measures were modified to assess daily levels of the variables, rather than trait (i.e., the diary records asked participants to "consider TODAY only" while completing the records). On average, it took 2 to 5 minutes for participants to complete each record.

Daily self-concealment was assessed with five items ("I felt that people didn't know what I'm really like," "I was often hiding a part of who I am," "At times I was pretending to be someone I am not," "I felt that I had to hide information about myself from another person," and "I was afraid I would reveal something I didn't want to reveal"). The items were rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale.

Daily need satisfaction was assessed with six items from the General Need Satisfaction scale. Two items measured daily autonomy ("I felt like I was free to do what I wanted today" and

“I generally felt free to pursue my interests”), daily competence (“I felt a sense of accomplishment from what I did” and “I did not feel very capable”), and daily relatedness (“I felt close and connected to the people I interacted with” and “I wish the people I interacted with liked me more”). The items were rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale.

Daily well-being was assessed similarly to previous studies (e.g., Reis et al., 2000; Sheldon et al., 1996). Four items covered life satisfaction (“I am satisfied with my life”), perceived stress (“I felt nervous and stressed”), and subjective vitality (“I felt alive and vital” and “I had energy and spirit”), which participants rated from 1 (*strongly disagree*) to 7 (*strongly agree*). Additionally, participants rated nine adjectives (Diener & Emmons, 1984) to report positive affect (e.g., *joyful, happy, pleased, enjoyment/fun*) and negative affect (e.g., *depressed, worried/anxious, frustrated, angry/hostile, unhappy*). The items were rated on a scale of 1 (*not at all*) to 7 (*extremely*). Finally, a nine-item physical symptom checklist (Emmons, 1991) was included. The checklist included symptoms such as headaches, upset stomach, and coughing. Following the example of previous studies (e.g., Reis et al., 2000), a composite well-being score was created by first standardizing each measure and then subtracting the sum of the three negative measures (perceived stress, negative affect, and number of symptoms) from the sum of three positive measures (life satisfaction, vitality, and positive affect).

Person-Level Measures

Participants completed an initial questionnaire packet containing several measures. Only trait self-concealment, which was assessed by the Self-Concealment Scale (Larson & Chastain, 1990), is relevant to the purpose of this study.

Results and Discussion

Analytic strategy. The goal of the current analysis was to examine the day-level associations between self-concealment, well-being, and need satisfaction. The structure of the data was such that daily measures were nested within person. In Model 1, day-level well-being was estimated by the following equations:

$$WB_{ij} = b_{0j} + b_{1j}(SC_{ij}) + e_{ij}$$

(Level 1 equation)

$$b_{0j} = \gamma_{00} + \gamma_{01}SC_j + u_{0j}$$

(Level 2 equation)

$$b_{1j} = \gamma_{10} + \gamma_{11}SC_j + u_{1j}$$

(Level 2 equation)

Combining the equations (Model 1),

$$WB_{ij} = \gamma_{00} + \gamma_{01}(SC_j) + \gamma_{10}(SC_{ij}) + \gamma_{11}(SC_j \times SC_{ij}) + e_{ij} + u_{0j} + u_{1j}(SC_{ij}),$$

where WB_{ij} and SC_{ij} refer to daily well-being and daily self-concealment scores, respectively, of the j th individual on the i th day; b_{0j} refers to the random intercept, which represents mean daily well-being for j th person across the days that person completed records; b_{1j} is the random slope, which represents the day-level relationship between self-concealment and well-being for the j th individual; SC_j refers to the trait self-concealment score of the j th individual; γ_{00} refers to the grand mean of daily well-being (average well-being across all participants and all days); γ_{01} is the effect of trait self-concealment on mean daily well-being; γ_{10} is the mean slope (average association between daily self-concealment and daily well-being); γ_{11} is the effect of trait self-concealment on the daily association between self-concealment and well-being; and u_{0j} and u_{1j} represent error terms for the intercept and the slope for the j th individual.

The first research question asked whether daily well-being covaries negatively with self-concealment. In Model 1, significance of γ_{10} would imply a significant relationship between daily self-concealment and daily well-being. We expected this relationship to be negative and significant (Hypothesis 1).

Second, one can also ask if trait self-concealment is associated with mean daily well-being. If γ_{01} is significant, it would indicate that trait self-concealment is associated with a person's mean daily well-being. We expected this relationship to be negative and significant (Hypothesis 2).

Our last question regarding this model was whether day-level covariation between self-concealment and well-being changes depending on trait self-concealment. Significance of γ_{11} would indicate that the association between daily self-concealment and daily well-being is moderated by trait self-concealment. We did not have any hypotheses regarding this interaction effect.

In Model 2, we applied the same equations with daily need satisfaction as the criterion. That is:

$$NS_{ij} = b_{0j} + b_{1j}(SC_{ij}) + e_{ij}$$

(Level 1 equation)

$$b_{0j} = \gamma_{00} + \gamma_{01}SC_j + u_{0j}$$

(Level 2 equation)

$$b_{1j} = \gamma_{10} + \gamma_{11}SC_j + u_{1j}$$

(Level 2 equation)

Combining the equations (Model 2),

$$NS_{ij} = \gamma_{00} + \gamma_{01}(SC_j) + \gamma_{10}(SC_{ij}) + \gamma_{11}(SC_j \times SC_{ij}) + e_{ij} + u_{0j} + u_{1j}(SC_{ij}).$$

The coefficients can be interpreted in a similar fashion by considering daily need satisfaction as the criterion instead of daily well-being. NS_{ij} and SC_{ij} refer to daily need satisfaction and daily self-concealment scores, respectively, of the j th individual on the i th day; b_{0j} refers

to the random intercept (mean daily need satisfaction for the j th person across the days that person completed records); b_{1j} is the random slope, which represents the day-level relationship between self-concealment and need satisfaction for the j th individual; γ_{00} refers to the grand mean of daily need satisfaction (average need satisfaction across all participants and all days); γ_{01} is the effect of trait self-concealment on mean daily need satisfaction; γ_{10} is the mean slope (average association between daily self-concealment and daily need satisfaction); γ_{11} is the effect of trait self-concealment on the daily association between self-concealment and need satisfaction; and u_{0j} and u_{1j} represent error terms for the intercept and the slope for the j th individual.

We made similar hypotheses; that is, daily self-concealment would be negatively associated with daily need satisfaction (Hypothesis 3), and trait self-concealment would be negatively associated with mean daily need satisfaction (Hypothesis 4). We did not have any hypotheses regarding the interaction effect.

In both models, to eliminate between-person effects, daily self-concealment scores were cluster-mean centered. In other words, daily self-concealment scores represented a person's deviation from his or her mean self-concealment score across the days that person completed the diary records.

Mediation analysis. To test the hypothesis that the association between daily self-concealment and daily well-being is mediated by daily need satisfaction, we followed the guidelines of Bauer, Preacher, and Gil (2006) to test mediation in multilevel models. The variables included in the model were self-concealment, need satisfaction, and well-being. All variables were at the day level, so the model was a lower level mediation with a $1 \rightarrow 1 \rightarrow 1$ structure. The two equations were:

$$\begin{aligned} NS_{ij} &= d_{nsj} + a_j(SC_{ij}) + e_{nsij} \\ WB_{ij} &= d_{wbj} + b_j(NS_{ij}) + c_j'(SC_{ij}) + e_{zjij} \end{aligned}$$

The two intercepts and the three slopes were assumed to be random. The model was formulated with a single Level 1 equation using indicator variables.

$$Z_{ij} = S_{Mij}(d_{nsj} + a_j SC_{ij}) + S_{Yij}(d_{wbj} + b_j NS_{ij} + c_j' SC_{ij}) + e_{zjij}$$

where S_{Mij} and S_{Yij} are indicator variables. When Z refers to need satisfaction, S_M is set to 1 and S_Y is set to 0. When Z refers to well-being, S_M is set to 0 and S_Y is set to 1.

Participants completed 1,228 out of 1,344 possible records over the 16-day period, with an average of 14.6 records per person. Only 4 participants completed fewer than 10 records (with a minimum of 5 records). Seven participants lost track of their number of records completed and participated an extra day (i.e., 17 records). Daily well-being scores ranged between -15.73 and 7.47 ($M = 0$, $SD = 4.47$),

Table 2. Multilevel Model With Daily Well-Being as the Criterion (Study 2)

Fixed effects	Estimate	SD	t
Intercept (γ_{00})	-0.01	0.32	-0.04
Daily self-concealment (γ_{01})	-1.07**	0.13	-8.41
Trait self-concealment (γ_{10})	-2.06**	0.41	-8.04
Interaction (γ_{11})	0.27	0.18	1.45
Random effects	Estimate	SD	Z
var(u_{0j})	7.71**	1.26	6.09
var(u_{1j})	0.42*	0.21	2.02
cov(u_{0j} , u_{1j})	0.06	0.38	0.15

The variable γ_{00} refers to the grand mean of daily well-being (average well-being across all participants and all days), γ_{01} is the effect of trait self-concealment on mean daily well-being, γ_{10} is the mean slope (average association between daily self-concealment and daily well-being), γ_{11} is the effect of trait self-concealment on the daily association between self-concealment and well-being, and u_{0j} and u_{1j} represent error terms for the intercept and the slope for the j th individual.

* $p < .05$. ** $p < .001$.

daily self-concealment scores ranged between 1 and 7 ($M = 2.63$, $SD = 1.49$), and daily need satisfaction scores ranged between 1.33 and 7 ($M = 5.00$, $SD = 1.10$). We used the PROC MIXED routine in SAS with maximum likelihood estimation to estimate the coefficients.

Model 1: Daily well-being as the dependent variable. The findings for Model 1 are summarized in Table 2. The analyses revealed that the mean slope (γ_{10}) was negative and significant, as expected. That is, daily self-concealment significantly predicted lower daily well-being, controlling for trait self-concealment (Hypothesis 1). In other words, across all participants, well-being was lower on days where self-concealment was higher. Note that the estimated coefficients are unstandardized values and should be interpreted accordingly. For instance, the coefficient for daily self-concealment (-1.07) suggests that for every 1 SD from an average day's self-concealment (i.e., daily self-concealment scores were centered within individuals and represent deviations from that person's mean daily self-concealment), the well-being score dropped 1.07 points, controlling for trait self-concealment.

Our second hypothesis was also supported. Trait self-concealment was negatively and significantly associated with daily well-being (Hypothesis 2). High trait self-concealment significantly predicted lower mean daily well-being. In other words, people who are higher in trait self-concealment had lower average daily well-being scores across the number of days they participated.

Finally, the interaction between trait self-concealment and daily self-concealment was not significant. That is, the negative relation between daily self-concealment and daily well-being did not change significantly depending on a person's trait self-concealment.

Table 3. Multilevel Model With Daily Need Satisfaction as Criterion (Study 2)

Fixed effects	Estimate	SD	t
Intercept (γ_{00})	5.06**	0.75	67.82
Daily self-concealment (γ_{01})	-0.34**	0.04	-9.55
Trait self-concealment (γ_{10})	-0.55**	0.1	-5.63
Interaction (γ_{11})	0.14*	0.05	2.84
Random effects	Estimate	SD	Z
var(u_{0j})	0.44**	0.07	6.09
var(u_{1j})	0.04*	0.02	2.92
cov(u_{0j} , u_{1j})	0.02	0.03	0.81

The variable γ_{00} refers to the grand mean of daily well-being (average well-being across all participants and all days), γ_{01} is the effect of trait self-concealment on mean daily well-being, γ_{10} is the mean slope (average association between daily self-concealment and daily well-being), γ_{11} is the effect of trait self-concealment on the daily association between self-concealment and well-being, and u_{0j} and u_{1j} represent error terms for the intercept and the slope for the j th individual.

* $p < .05$. ** $p < .001$.

Model 2: Daily need satisfaction as dependent variable.

The findings for Model 2 are summarized in Table 3. Our third hypothesis, which suggested that daily self-concealment would be negatively related to daily need satisfaction, was supported. Daily self-concealment significantly predicted lower daily need satisfaction (Hypothesis 3). Participants reported lower need satisfaction on the days they reported higher self-concealment.

Our fourth hypothesis suggested that trait self-concealment would be negatively associated with mean daily need satisfaction. This hypothesis was also supported. Results showed that high trait self-concealment predicted lower mean daily need satisfaction (Hypothesis 4).

Finally, the interaction between trait self-concealment and daily self-concealment was significant. The negative association between daily self-concealment and daily need satisfaction was stronger for individuals who were high on trait self-concealment, slope = -0.44 , $t(82) = -8.23$, $p < .001$, than the association between daily self-concealment and daily need satisfaction for individuals who were low on trait self-concealment, slope = -0.23 , $t(82) = -4.16$, $p < .001$. However, it should also be noted that both slopes were significant. In other words, even for people who are low in trait self-concealment, there was a significant negative relation between daily self-concealment and daily need satisfaction.

Mediation analysis. It was hypothesized that the daily relation between self-concealment and well-being would be mediated by daily need satisfaction. Results of the mediation analyses supported the mediation hypothesis. The mediation model with path coefficients (fixed effects) is presented in Figure 2, and the random effects are summarized in Table 4. The average indirect (mediated) effect of self-concealment on well-being (via need satisfaction) was -0.80 ($SE = .12$, $p < .001$), whereas the average total effect of self-concealment

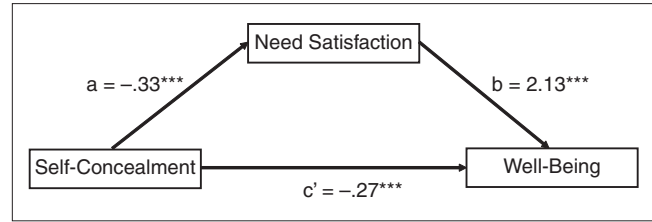


Figure 2. Fixed effects for multilevel mediation model (Study 2) *** $p < .001$.

Table 4. Random Variances for Multilevel Mediation Model (Study 2)

	Variance	SE
Intercepts		
d_{nsj}	0.62***	0.10
d_{wbj}	10.39***	1.64
Slopes		
a_j	0.06***	0.02
b_j	1.62***	0.40
c_j	0.09	0.09

Random variances for the intercepts and the slopes are reported. d_{nsj} and d_{wbj} represent the intercepts for need satisfaction and well-being. a_j , b_j , and c_j represent the slopes for the paths a, b, and c' in Figure 2. *** $p < .001$.

on well-being was -1.07 ($SE = .11$, $p < .001$). In other words, 75% of the association between self-concealment and well-being was mediated by need satisfaction. These results replicated the findings of Study 1 and provided further support for our explanation of why self-concealment is associated with negative outcomes.²

General Discussion

These two studies suggest that the negative association between self-concealment and well-being is mediated by unfulfilled basic psychological needs. In Study 1, the structural model provided an acceptable fit to the data, and self-concealment had a unique association with basic need satisfaction and well-being, independent of distress disclosure. Study 2 replicated the mediational model using a multilevel design and suggested that the relation between daily self-concealment and daily well-being is mediated by daily satisfaction of basic psychological needs. These findings provide empirical support for an SDT account of why self-concealment predicts poor well-being.

The present research makes several contributions to the literature. First, it provides more empirical evidence on the link between self-concealment and well-being. Although past research has shown that self-concealment is associated with negative outcomes, we are not aware of any studies that linked daily variations in self-concealment with daily variations in well-being. Similarly, Study 1 also demonstrated that self-concealment is independent

from distress disclosure and that it has a unique association with well-being. Both of these findings add support to the relation between self-concealment and well-being, as well as the distinction between self-concealment and self-disclosure.

A second contribution of the present research is that although researchers have proposed different models to explain the relation between self-concealment and well-being, the reason self-concealment is associated with negative outcomes is still not well understood. The findings of the current studies suggest that self-concealment is problematic because it leads to unfulfilled autonomy, competence, and relatedness needs. We believe that the self-determination model presented in this article provides a broader alternate explanation for the mechanism between self-concealment and well-being. This approach is broader in the sense that the three basic psychological needs of SDT capture the themes found in previous explanations. For instance, the explanations regarding inhibition (Pennebaker, 1989) or preoccupation (Lane & Wegner, 1995) are considered threats to one's autonomy. Similarly, the self-perception explanation (Derlega et al., 1993) is similar to a threat to one's competence. In sum, the model presented in this research explains the mechanism behind the link between self-concealment and well-being from a SDT perspective.

Third, our research addresses Kelly and Yip's (2006) assertion that the process of secret keeping is not related to negative outcomes, whereas high self-concealers (i.e., individuals with inhibited personalities) are vulnerable to psychological problems. Our findings in Study 2 suggest that regardless of whether one was a high self-concealer, participants had lower well-being on the days they self-concealed more. Furthermore, a major percentage of this association was mediated by the lack of basic need satisfaction. Therefore, we suggest that the association between self-concealment and well-being is not only attributable to an inhibited personality, but it is also a consequence of unfulfilled needs, which stem from the process of self-concealment (or keeping distressing secrets).

A final contribution is that the current studies place the research on self-concealment within the well-validated framework of SDT (Deci & Ryan, 1985, 2000), opening potential avenues for future studies. Also, Study 2 replicated the findings of previous studies that found that unfulfilled basic needs are detrimental to daily well-being (Reis et al., 2000; Sheldon et al., 1996), adding empirical evidence to the predictive power of self-determination theory.

A number of caveats for our studies should be mentioned. One limitation is that our sample consisted of undergraduate psychology students who may not be representative of the general population. Second, the participants were mostly female, further limiting the generalizability of our findings. Future studies might attempt to replicate the findings with a more representative sample. Another limitation is the correlational nature of the studies. As a result, the causal directions

hypothesized in the mediation model are theoretical. We acknowledge that our findings do not show that self-concealment causes a lack in satisfaction of basic needs or leads to negative well-being.³ As stated before, causality can be demonstrated by experiments that manipulate self-concealment and then measure need satisfaction. Similarly, long-term longitudinal studies or quasiexperimental studies in naturalistic contexts can provide additional insight about causal directions. This issue requires further investigation, and researchers should remember that other causal models are also possible. Finally, our data consist of self-report measures and lack evidence for behavioral aspects of self-concealment. Although we measured daily self-concealment, we did not examine specific self-concealment behaviors and whether such behaviors impede need satisfaction. Despite these limitations, the present studies provide a new approach for understanding why self-concealment is associated with negative outcomes and opens new research possibilities.

Future studies can investigate other potential mediators of the association between self-concealment and well-being. Need satisfaction partially mediates the relation between self-concealment and well-being, so there may be other mediators that can further complete the model. Also, the model can be tested in different contexts, such as in romantic relationships, family relationships, and friendships. For instance, one could investigate whether self-concealment from one's romantic partner has negative implications for relationship outcomes, and if that is the case, whether this relation is mediated by the fulfillment of one's basic needs in a relationship. Similarly, one might demonstrate that self-concealment from one's romantic partner is different and unique from self-disclosure to one's partner.

Another future line of research would be to investigate the different strategies in which self-concealers engage and how these strategies relate to well-being. For instance, self-concealers might use passive strategies such as ignoring or not broaching the subject, or they might engage in more active strategies, such as misleading or lying. These strategies might relate to well-being differently. After all, self-concealment is defined as a more active than passive process. Self-concealers are likely to be preoccupied with their secrets, have unwanted thoughts about their secrets intrude into their minds, and be afraid of revealing them inadvertently. As a result, self-concealment is more likely to lead to active deception strategies such as being misleading, or even lying, when confronted directly.

Furthermore, we conceptualize self-concealment as a construct closely related to authenticity (Kernis & Goldman, 2006). Authenticity has four components: *Awareness* involves acceptance of potentially contradictory facets of self, *unbiased processing* involves being objective when processing self-relevant information, *behavioral authenticity* involves engaging in behaviors that reflect internal rather than external motives and needs, and *relational authenticity* involves being genuine in one's interactions with others. We

believe that self-concealment would especially undermine behavioral and relational authenticity.

The focus of the present studies was on self-concealment, the tendency to hide negative or distressing information about oneself. This raises the question of whether keeping positive aspects of oneself secret from others would also be problematic for well-being. We suggest that keeping secrets can be problematic as long as it thwarts the satisfaction of basic needs, which can occur even for positive secrets. In contrast, it could also be that people can keep negative secrets autonomously, or in a self-determined way, under certain conditions. Furthermore, concealing certain self-aspects might be less detrimental to need satisfaction and well-being than revealing them. What we present here is a general model; the moderators of the associations between self-concealment, need satisfaction, and well-being should be investigated in future studies.

In conclusion, the findings imply that self-concealment is detrimental to the satisfaction of basic needs, which could then result in lower well-being. Also, this association appears to be valid regardless of personality differences. It seems that inauthentic acts such as self-concealment may have negative implications for individuals' basic needs and well-being in daily life.

Authors' Note

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Notes

1. Mean scores were compared based on the method of data collection. Participants who completed the survey online had slightly higher self-concealment scores ($M_s = 2.75$ and 2.43), $t(180) = 2.56$, $p < .05$, and slightly lower symptoms scores ($M_s = .71$ and $.93$), $t(178) = -2.20$, $p < .05$. None of the other means were significantly different. Furthermore, regression analyses showed that the method of data collection did not moderate any of the paths between self-concealment, need satisfaction, and indicators of well-being.
2. To examine each need's association with well-being, we conducted an analysis with separate needs (autonomy, competence, and relatedness), trait- and day-level self-concealment, the interaction between trait- and day-level self-concealment, and the previous day's well-being as predictors of a given day's well-being. The results showed that all predictors except the interaction effect had a significant effect on well-being. The unstandardized estimates were: daily self-concealment = $-.31$, $p < .001$; trait self-concealment = $-.49$, $p < .05$; previous day's well-being = $.19$, $p < .001$; daily autonomy = $.90$, $p < .001$; daily competence = $.82$, $p < .001$; and daily relatedness = $.41$, $p < .001$.
3. A reviewer suggested that comparing semipropective relations in Study 2 (e.g., whether self-concealment on a specific day predicts well-being of the same day, controlling for well-being of the previous day, compared to whether well-being on a specific day predicts self-concealment of the same day, controlling for self-concealment of the previous day) might provide more insight on causal directions. We conducted these analyses and checked the reduction in Level 1 error variance to examine the effect sizes. In all three associations, our analyses showed the same effect sizes in both directions.

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