

Hidden failures

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ABSTRACT

Failure often contains useful information, yet across five studies involving 11 separate samples ($N = 1238$), people were reluctant to share this information with others. First, using a novel experimental paradigm, we found that participants consistently undershared failure—relative to success and a no-feedback experience—even though failure contained objectively more information than these comparison experiences. Second, this reluctance to share failure generalized to professional experiences. Teachers in the field were less likely to share information gleaned from failure than information gleaned from success, and employees were less likely to share lessons gleaned from failed versus successful attempts to concentrate at work. Why are people reluctant to share failure? Across experimental and professional failures, people did not realize that failure contained useful information. The current investigation illuminates an erroneous belief and the asymmetrical world of information it produces: one where failures are common in private, but hidden in public.

1. Introduction

A quick Google search yields 1.28 billion results for the word “success,” in contrast to 553 million—half as many—for the word “failure.” This imbalance replicates across nearly all major websites and social media platforms. For every two “success” videos uploaded to YouTube (~25 million), there is one about “failure” (~10.9 million). Contrary to the common belief that newspapers sell negative news, since 1851, the *New York Times* has published twice as many articles about “success” (~596,000) versus “failure” (~370,000)—a ratio that even holds in the sports section, where, assuredly, for every player that wins, another loses.

We explore one cause of this informational imbalance: people undershare failures with others. We define a failure as an action that does not achieve its intended goal—so, for example, selecting a losing box in a game where the goal is to win, or getting distracted at work when one intended to concentrate. Although failure often conveys useful information by teaching what to avoid, people may not realize this, and may hesitate to share failure experiences. We test whether people are reluctant to share information gleaned from failed actions compared with successful actions or actions on which people receive no feedback (i.e., actions tied to no information at all).

The reluctance to share information on failure could have important implications for social learning and group knowledge. If employees do not share information on unsuccessful actions, fellow employees will not know what to avoid. More generally, if people do not discuss failed products and programs, this knowledge does not transfer. Social

knowledge transmission determines many consequential outcomes: for example, the medicines clinicians prescribe (Iyengar, Van den Bulte, & Valente, 2011), and up to half of all consumer purchases (Bughin, Doogan, & Vetvik, 2010). If publically available information is lopsided—advertising success, but silent on failure—these and other outcomes will suffer.

In the current investigation, we document peoples’ reluctance to share information on failed actions and identify one cause of this reluctance: people overlook the information in failure.

2. People should share failures

When information is shared, society benefits (Herrmann, Call, Hernández-Lloreda, Hare, & Tomasello, 2007). Most individual knowledge is not acquired independently; it is transferred from the social group. In fact, the bounds between individual and group knowledge are so ill-defined that most people cannot identify where others’ knowledge ends and theirs begins (Sloman & Rabb, 2016). People regularly adopt the attitudes (Hardin & Higgins, 1996), tastes (Fishbach & Tu, 2016), and memories (Wegner, 1987) of others as their own.

Groups with fluid knowledge transfer—defined as the transfer of knowledge and experience from one person to another (Argote & Ingram, 2000)—perform better (e.g., Mesmer-Magnus & DeChurch, 2009). In contrast, when groups self-censor, succumbing, for example, to groupthink, they suffer on these same outcomes (Sunstein & Hastie, 2015). Sharing failure-related knowledge may be especially beneficial.

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Learning vicariously from others' failures is a safe way to learn from costly, risky actions (Bandura, 1961). As a result, there ought to be pronounced benefits that accrue from seeking and sharing this information with others.

Failure also appears to be a great teacher. Negative affect improves learning (Baumeister, Alquist, & Vohs, 2015; Peters, Västfjäll, Gärling, & Slovic, 2006). Compared to positive information, negative information commands more attention (Graziano, Brothen, & Berscheid, 1980), is processed more deeply (Taylor, 1991), and remembered for longer (Quirk, Repp, & LeDoux, 1995). Bad is stronger than good (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001; Tversky & Kahneman, 1992). Insofar as people attend to failures and learn from them, they should realize the informational value of these experiences, and share this knowledge with others.

3. People might, nevertheless, undershare failure

Despite the reasoning above, people may not share their failures with others. For example, researchers in the social sciences long undershared their failed experiments. This may occur for a variety of reasons. First, and most intuitively, self-esteem considerations likely drive undersharing. Researchers do not want to share results that cast them in an unfavorable light. Second, researchers may undershare because they do not attend to failures in the first place. Third, researchers may keep failures to themselves because the information in failure is not useful, and therefore, not worth sharing. Fourth, the information in failure may be useful, yet researchers believe it is not. We explore these four possibilities below.

Self-esteem concerns are an intuitive reason people would not share failures with others. People often remain "mum" instead of sharing information that reflects poorly on the self or others (Tesser & Rosen, 1975). So too, people share positive content more than negative content in social networks, where presumably, they are motivated to self-enhance (Berger & Milkman, 2012; Wojnicki & Godes, 2008).

Second, people might undershare failure because they do not attend to it. Novices tend to avoid negative performance feedback (Finkelstein & Fishbach, 2012, 2017), patients avoid medical tests that would confirm an undesirable diagnosis (Oster, Shoulson, & Dorsey, 2013), and investors are less likely to check their financial status when the stock market drops—the "ostrich effect" (Sicherman, Loewenstein, Seppi, & Utkus, 2015). Because people often ignore or discount negative outcomes (Halevy & Chou, 2014), they update their beliefs more following success versus failure. For example, in one study, investors who accumulated the same number of successful and failed investments paid more attention to their successes than their failures, and as a result, grew overconfident (Gervais & Odean, 2001; see also Langer, 1975).

A third possibility is that failures are actually uninformative. When failures are frequent and vary, it might be hard to conclude how to succeed based on information gleaned from failure. Similarly, when external causes (e.g., luck) are responsible for failure, it is hard to extract lessons on how to modify actions to enable success.

A fourth possibility is that even when people attend to objectively informative failures, they do not realize that failures contain useful information, and for this reason, they do not share them with others. Detecting the information in failure can require more effort than detecting the information in success. Whereas success highlights actions that lead directly to desired ends, the information in failure is more oblique. It tells what one should avoid in order to succeed. Insofar as people are cognitive misers (Stanovich, 2009), they may have a hard time recognizing the information in failure because it is difficult to extract. Thus, although the cognitive miser phenomenon has not been used to make predictions about peoples' differential reactions to success and failure, it could predict that people will learn less from failure than from success.

Consistent with this idea, people often neglect to search for contradictory information. Instead, they exhibit confirmation bias,

selectively generating and attending to confirmatory evidence (Nickerson, 1998). In the Wason Selection Task, the most famous example of unmotivated, biased information search, participants must determine the truth of a pre-established rule—for example, "every card with a circle on one side has yellow on the other side." Participants then choose which cards to flip over in order to establish the rule's veracity. Whereas participants intuitively flip cards that confirm the hypothesis (e.g., they flip cards with circles to make sure they are yellow on the back), they do not realize that falsifying the hypothesis (e.g., flipping over a red card to be sure there is not a circle on the other side) would also provide useful information. In testing hypotheses, people see value in tests they expect to be successful, but do not realize there is value in generating tests that they expect to fail.

If people do not realize that failure contains useful information, they will keep failed actions to themselves, instead of sharing them with others. To test this possibility, we designed paradigms that minimized self-enhancement motives and required people to attend to failure. Under these circumstances, we tested whether people undershare failure with others, and if so, whether they do this because they do not realize that failure contains useful information.

4. The present research

Our first and primary hypothesis is that people hesitate to share failures with others. As stated above, throughout the studies in the present investigation, we define a failure as an action that does not achieve its intended goal—so, for example, selecting a losing box in a game where the goal is to win, or missing out on a promotion at work. To test whether people undershare failures with others, we compared peoples' relative willingness to share information gleaned from failure experiences, success experiences, and experiences that offer no feedback at all (i.e., they teach no new information). We compared the sharing of failure to the sharing of success to explore peoples' willingness to share experiences that have analogous levels of information. However, this comparison does not clarify whether people are over-eager to share success or reluctant to share failure. As a result, we also compared peoples' willingness to share failure to their willingness to share experiences that contain no feedback at all and hence, by definition, contain no information.

Why might people undershare failures? Our second hypothesis is that people do not share failure because they do not realize that failure contains useful information. Given this hypothesized process, we expected people to report that there is less to learn from failure versus success (even when this is incorrect). We also expected that highlighting the information in failure would attenuate the main effect—that is, it would increase the likelihood that people would see the information in failures, and share them with others.

We examined whether people undershare failure across two distinct failure paradigms. In the first paradigm, an experimental paradigm, failure was objectively more informative than the comparison experience (Studies 1–3). This paradigm allowed us to determine whether people undershare failure when it is objectively wrong to do so. The second paradigm captured professional success and failure experiences. In this professional paradigm, it was hard to compare the relative informational value failure and success experiences (Studies 4–5). Although evidence for undersharing in this second paradigm offered external validity, we could not control for the actual information value in success versus failure. For example, in reports of professional experiences, external, uncontrollable factors can cause failures (vs. successes), which would leave less to be learned from these experiences. Given this limitation, we tested for the hypothesized process—that people undershare failure because they fail to see the information in it—across both experimental and professional paradigms.

Several alternative processes could explain why people hesitate to share their failures. The most obvious one is that people are strongly motivated to project a positive self-image (i.e., enhance or verify their

positive self-esteem; Sedikides, 1993; Swann & Read, 1981). To address this, across studies we took steps to minimize impression management concerns. We ensured that all sharing was anonymous and asked participants to share failures that were not ego-threatening (e.g., the failure to choose a winning box in a lottery). In some cases, we asked participants which experience they would like shared back with *them* later in order to help *them* succeed. When we muted—or entirely removed—self-presentation motives in these ways, we expected people to continue to undershare failures because of the erroneous belief that failures do not contain useful information. We also measured the effects of failure on self-esteem and learning, in order to test whether the information in failure explained undersharing independent of self-esteem.

Another reason people might not share failures is because they do not attend to failures in the first place. To the extent that failures do not receive attention, people will not process or share them. To address this alternative, the paradigms we used in the present investigation ensured that participants attended to and thought through failures that they might otherwise have wished to avoid. Even when failures were, by necessity, attended to, we expected people to hesitate to share these experiences with others.

Finally, it is possible that people undershare failure, relative to success, because failure actually contains less useful information. To address this alternative, we developed a new experimental task, which allowed us to control the information in success versus failure. In this task, players chose between several mystery boxes containing different monetary amounts (e.g., \$-0.01, \$0.20 and \$0.80). Participants received complete knowledge of all possible outcomes before playing. During the game, players learned the box locations of two amounts (e.g., \$-0.01 and \$0.20), following which they decided which information—the location of the loss (\$-0.01) or the moderate win (\$0.20)—to share with the next participants to help them win money. Sharing the losing (i.e., failure) box (\$-0.01) was more helpful than sharing the moderate win (\$0.20), because knowing to avoid the losing box guarantees a larger gain (\$0.20 or \$0.80). Of course, knowing the location of the large win of \$0.80 would be most useful, but sharing this is not an option. The task models situations common to organizational settings in which the key to success is avoiding mistakes.

We predicted that people would share success over failure, even when the information in success was less instructive and helpful to others (Studies 1a-1f). In this task, the monetary values were chosen to ensure that failure contained objectively more information than success. The task tested the participant's ability to recognize the information in failure, holding attributions and situational factors constant.

Using various iterations of this task, we addressed several alternative explanations of the main effect. Specifically, we tested whether people undershared failure because they were not motivated to help the next participant (Study 1b), or because they thought participants would react negatively to a something that looked like a “loss” (Study 1c). We further tested whether participants were influenced by the relative magnitudes of success and failure (Study 1d), and whether people would continue to undershare failure in a four-box game in which receiving failure-related information was no longer risk-free for the recipient (Studies 1e-1f).

To complement this study, we developed a second experimental task (Study 2) that compared peoples' willingness to share failure to their willingness to share a no-feedback experience, which, by definition, offers no information at all. In this second task, participants answered a series of binary-choice questions, each of which had two answer choices. Participants learned that they selected the incorrect answer to some of the questions, and received no feedback on other questions. The critical outcome was which information participants then shared with others. Because each binary-choice question had only two answer choices, participants who received failure feedback could infer the correct answer from this feedback. In contrast, participants who received no feedback learned nothing. We predicted that most participants would choose to share information on an answer on which they

received no feedback over an answer on which they received failure feedback, thus undersharing failure.

We also tested whether people undershared failure in professional settings. Specifically, we tested whether teachers in schools were less likely to share stories of professional failure than stories of professional success (Study 4), as well as whether a group of employees in the workforce were less likely to share their work-related failures than their work-related successes (Study 5).

We tested for evidence of mechanism—that people are less able to see the information in failure than success—in both paradigms. To do this, we examined whether highlighting the information in failures increased peoples' willingness to share failures with others in an experimental task (Study 3), as well as whether peoples' inability to see the information in professional failures explained the undersharing of these experiences (Study 5). Data and materials for all studies are on OSF (https://osf.io/apxvu/?view_only=c381e5d4b04c4ed49d690be69aba7f0a).

5. Study 1: The box game

In Study 1, we introduce a novel task paradigm in which a failure experience provides better information on how to succeed than a success experience. Our task models situations in which the key to success is avoiding mistakes (e.g., a team in which all managers can mentor new employees with varied success, except one underperforming manager who will provide bad mentoring; a set of health plans that are all decent except for one plan that provides partial coverage). Specifically, in our task, people reveal two mystery boxes from a larger set, each of which contains a different sum (e.g., \$-0.01, \$0.20 and \$0.80). When given the opportunity to reveal the location of one of these two amounts to the next participant (to help that person win money), we expected participants to hesitate to share the low-value box (e.g., \$-0.01 over \$0.20)—the “losing” box, despite the fact that sharing the location of the lower-value box leads to greater gains for the recipient than sharing the moderate value. For example, if the next participant learns the location of the \$-0.01 box, she will either win \$0.20 or \$0.80; in contrast, if she learns about the \$0.20 box, she will either choose it (get \$0.20) or take a risk and choose between \$-0.01 and \$0.80. Thus, learning the location of the moderate-value box leads to lower expected wins than learning the value of the lower-value box. (Notably, sharing the \$0.80 is not an option.)

We report six versions of the box task. In the first four (Studies 1a-1d), participants played a three-box game, in which two boxes contained winning sums (i.e., \$0.20 and \$0.80) and one box contained a loss (–\$0.01). Participants received information on the location of the moderate win and the loss (\$0.20 and –\$0.01). In this three-box scenario, sharing the lower-value “losing” clue is the objectively correct answer. It has no downside. It involves no risk. It raises the recipient's expected wins while guaranteeing a sure win. Despite this, we expected a significant percentage of people (greater than 0%) to choose to share the small win-related information (that is, to “undershare failure”).

In the next two studies (Studies 1e-1f), participants played a four-box game (2 winning; 2 losing). Participants received information on the location of the moderate win and the moderate loss. In these studies, we calibrated the box values so that sharing a moderate loss, compared to a moderate win, led to higher expected wins for the recipient. In this four-box version of the task, because the value of sharing information on failure is somewhat harder to figure out, we expected participants to share wins significantly more than they shared losses—despite the fact that wins conveyed inferior information. We summarize the six task versions and the results of Studies 1a-1f in Table 1.

5.1. Study 1a: Sharing box game failures

In Study 1a, participants played a three-box game (–\$0.01, \$0.20,

Table 1
 Study designs and results summary for Studies 1a-1f. Percentage of participants choosing to reveal each of the two boxes, whether these percentages differed from each other (a 50–50 distribution), and whether the percentage of those sharing failure differed from zero (a 100–0 distribution) (Studies 1a-1f).

Studies 1a-1f		Do people share more successes or failures (i.e., does the choice distribution deviate from a 50–50 distribution)?		Do a significant proportion of people share the inferior (moderate success) box (i.e., does the choice distribution deviate from a 100–0 distribution)?	
Study 1a	Box amounts: % selecting each box	–\$0.01 59%	\$0.20 41%	\$0.80 –	$\chi(1) = 16.33, p < .001$
Study 1b	Box amounts: % selecting each box	–\$0.01 56%	\$0.20 44%	\$0.80 –	$\chi(1) = 19.36, p < .001$
Study 1c	Box amounts: % selecting each box	–\$0.01 68%	\$0.20 32%	\$0.80 –	$\chi(1) = 9.91, p < .001$
Study 1d	Box amounts: % selecting each box	–\$0.80 72%	\$0.20 28%	\$0.80 –	$\chi(1) = 7.84, p = .005$
Study 1e	Box amounts: % selecting each box	–\$0.02 40%	\$0.05 60%	\$0.25 –	$\chi(1) = 35.04, p < .001$
Study 1f	Box amounts: % selecting each box	–\$0.02 36%	\$0.20 64%	\$0.80 –	$\chi(1) = 38.76, p < .001$

Note. We tested two hypotheses in each study. For each study, the main hypothesis test is in bold.

\$0.80). Players learned the location of two of the boxes (–\$0.01, \$0.20), following which they had to decide which of these locations to share with the next participant, to help him/her maximize earnings. In this game, because there is only one losing box (\$-0.01), knowing its location leads to a sure win (either \$0.20 or \$0.80). Despite the fact that receiving failure information leads to a higher expected win for the recipient, we predicted that a substantial percentage of participants would (erroneously) share the moderate winning tip, instead of the losing tip, with others.

5.2. Method

5.2.1. Participants

We recruited participants via Prolific, a UK-based online platform. Participants of any nationality were allowed to participate, so long as their approval rating was at or above 90%. We recruited 100 participants in return for £0.20. Prolific returned 98 respondents (52.0% female; $M_{age} = 32.62, SD_{age} = 11.57$).

5.2.2. Procedure

This study used a within-subjects design. Each participant played two rounds of a box game. In each round, participants chose one mystery box, following which they learned the contents of the two boxes they chose. Prior to playing, participants learned that the three boxes contained the following values: (1) win 80 cents, (2) win 20 cents, and (3) lose 1 cent. The game was rigged: all participants learned they had selected the boxes containing “win 20 cents” and “lose 1 cent” (in counterbalanced order). See the full materials on OSF for the complete procedure.

As the dependent variable, participants decided which of the two chosen boxes to share with the next participant: “Now, your goal is to share some of your knowledge with the next group of participants to help them succeed on the mystery box task. As a coach, you are only allowed to share ONE tip with the next group of participants to help them win the most possible money.” Participants decided whether to tell others about the location of the box that contained “win 20 cents” or “lose 1 cent.”

5.3. Results

In support of the hypothesis, 41% (40/98) of participants shared the location of the winning tip (“win 20”) over the losing tip. This proportion was significantly higher than the logical expected proportion of 0% of people sharing the “win 20” clue: $\chi(1) = 16.33, p < .001$. The proportion of participants who (incorrectly) shared the winning tip was marginally smaller than the 59% (58/98) of participants who (correctly) shared the losing tip, $\chi(1) = 3.31, p = .069$. A large proportion of participants did not see that the failed (vs. successful) action was more informative: it maximized expected value.

We conducted a follow-up study (we recruited 50 participants; Prolific returned 51 respondents) to ensure the results were not driven by the negative number for the losing box. Our prediction was that people were hesitant to share the lowest-value option, which in this context, defines a loss, or a failure, as it is the “worst” game outcome, yet we wanted to address the alternative possibility that participants were simply reluctant to share negative amounts. In this follow-up, the three boxes contained the following values: (1) win 80 cents, (2) win 20 cents, and (3) win 1 cent. Supporting our hypothesis, replacing the lowest-valued box (“lose 1 cent”) with “win 1 cent” did not change the results: 35% (18/51) of participants shared “win 20”, which deviates from the logical expectation that 100% of participants would share the lower-value tip, $\chi(1) = 6.35, p = .012$. In this follow-up, the percentage of participants who made a mistake was lower than the percentage of participants who made the correct choice (35% vs. 65%), $\chi(1) = 4.41, p = .036$.

5.4. Study 1b: Incentivized to help

A significant proportion of participants undershared failure in Study 1a. This may be because they failed to see the information in failure, but we cannot rule out the possibility that participants recognized the information in failure yet did not share it because they wanted to sabotage the next player's performance. To address this, Study 1b once again asked participants to play the three-box game described in Study 1a, but this time, they were incentivized to help their "partner." Specifically, participants read that they would rely on their partners to help them in the next game. Under these conditions, we still expected a significant proportion of participants to undershare failure.

5.5. Method

5.5.1. Participants

We recruited participants via Amazon Mechanical Turk (MTurk), a US-based online platform. Participants of any nationality were allowed to participate, so long as their approval rating was at or above 90%. We recruited 100 participants, each for \$0.30. MTurk returned 100 respondents (49.0% female; $M_{\text{age}} = 23.45$, $SD_{\text{age}} = 12.74$).

5.5.2. Procedure

The three-box game procedure was identical to Study 1a, except for a cover story, which incentivized players to help the next participant. Before choosing the clue to share with the next participant, players read: "After this, your partner will go first and will help YOU by sharing some knowledge that will help you win money. It's in your best interest to share information that will maximally help your partner so that this participant, afterwards, will help you." Players chose which clue they wanted to share—the box containing "win 20" or "lose 1."

5.6. Results

Supporting our hypothesis, 44% (44/100) of participants shared the winning tip ("win 20"). This proportion was significantly higher than the logical expected proportion of 0% of people sharing the "win 20" clue, $\chi(1) = 19.36$, $p < .001$. We note that the proportion of participants who (incorrectly) shared the winning tip was not significantly different than the 56% (56/100) of the participants who (correctly) shared information on the box with the losing tip ("lose 1"), $\chi(1) = 1.44$, $p = .230$. Thus, a large proportion (almost half) of participants failed to see that a failed action contained more information than a successful one.

5.7. Study 1c: Choosing for oneself

While Study 1b addresses the possibility that participants did not want to help the next participant, it is still possible that participants saw the information in failure, and for other reasons chose not to share it. For example, maybe participants shared success to impress others. To address this possibility, Study 1c once again asked participants to play the three-box game described in Study 1a; however this time, participants chose which clue they wanted to *receive* prior to playing the game. That is, prior to playing, players chose to receive information on the box containing either the loss or the moderate win.

We expected a substantial proportion of participants to continue to request the winning clue, thus bringing stronger evidence for the hypothesized process—that participants undershare failure because they do not realize that failure contains useful information.

5.8. Method

5.8.1. Participants

We recruited 100 participants on Prolific; Prolific returned 97 respondents (56.7% female; $M_{\text{age}} = 32.65$, $SD_{\text{age}} = 10.90$). See Study 1a

for further recruitment details.

5.8.2. Procedure

The three-box game procedure was identical to Study 1a, except participants were asked to choose whether they wanted the "win 20" box or the "lose 1" box revealed to *themselves* prior to playing the game: "Before you play the game and choose your box, we are going to reveal ONE clue to you! We are going to tell you the contents of one of the boxes." Participants chose which clue they wanted to see before playing the game—the box containing "win 20" or "lose 1."

5.9. Results

In support of the hypothesis, 32% (31/97) of participants chose to receive the winning tip ("win 20"). This proportion is significantly higher than the logical expected proportion of 0% of people choosing to see the "win 20" clue, $\chi(1) = 9.91$, $p < .001$. We note that the proportion of participants who (incorrectly) chose to receive the winning tip is smaller than the 68% (66/97) of the participants who (correctly) chose to receive information on the box with the losing tip ("lose 1"), $\chi(1) = 12.63$, $p < .001$.

5.10. Study 1d: Balancing gain and loss

In Study 1d, we consider one other alternative explanation for the results of Studies 1a-1c: that people (erroneously) shared success because success had a greater absolute magnitude, and thus, drew more attention. To address this, we re-ran the game balancing the absolute magnitudes of the lowest and highest boxes (\$-0.80, \$0.20, \$0.80).

5.11. Method

5.11.1. Participants

We recruited 100 participants on Prolific; Prolific returned 100 respondents (64.0% female; $M_{\text{age}} = 23.49$, $SD_{\text{age}} = 11.61$). See Study 1a for further recruitment details.

5.11.2. Procedure

The procedure was identical to Study 1a, except the magnitudes of the boxes were as follows: "lose 80," "win 20" and "win 80." After playing the game, participants chose whether they wanted the "win 20" box or the "lose 80" box revealed to the next participant.

5.12. Results

In support of the hypothesis, 28% (28/100) of participants shared the winning tip ("win 20"). This proportion is significantly higher than the logical expected proportion of 0% of people sharing the "win 20" clue, $\chi(1) = 7.84$, $p = .005$. We note that the proportion of participants who (incorrectly) shared the winning tip is smaller than the 72% (72/100) of the participants who (correctly) shared information on the box with the losing tip ("lose 1"), $\chi(1) = 19.36$, $p < .001$. About a third of participants failed to see that a failed action contained more information than a successful one.

5.13. Study 1e: Sharing box game failures with four boxes

In Studies 1a-1d, participants undershared failure in one sense: a substantial proportion of people (approximately a third to a half) shared success over failure, even though sharing success was less informative and less helpful to the next participant.

In Studies 1e-1f, we changed the task from a three-box game to a four-box game (2 winning; 2 losing). Participants once again learned the locations of two boxes—the moderate win and the moderate loss—and had to choose which of these two boxes to share with the next participant. In these studies, sharing a moderate loss, compared to a

moderate win, led to higher expected gains for the recipient; however, sharing a moderate win had the advantage of offering the recipient a risk-free way of winning a modest amount of money. Our primary hypothesis was that participants would be significantly more likely to share information on the moderate wins than the moderate losses, even though the information in the moderate loss increased the expected value of the receiver's win more than the information in the moderate win. As a secondary hypothesis, parallel to the hypothesis tested in Studies 1a-1d, we examined whether a significant percentage of people (greater than 0%) shared win-related information even though, based on an expected value analysis, no one should.

5.14. Method

5.14.1. Participants

We recruited 100 participants via Prolific. Prolific returned 96 respondents (50% female; $M_{\text{age}} = 33.30$, $SD_{\text{age}} = 8.81$). See Study 1a for recruitment details.

5.14.2. Procedure

The procedure mirrored the procedure of Study 1a, the key difference was that in this game, players chose two out of four boxes. Prior to playing, participants learned that the four boxes contained the following values: (1) win 25 cents, (2) win 5 cents, (3) lose 1 cent, and (4) lose 2 cents. The game was rigged: all participants learned they had selected the boxes containing “win 5 cents” and “lose 1 cent” (in counterbalanced order). As the dependent variable, participants decided which of the two chosen box locations to share with the next participant.

We chose these four specific box values so recipients would benefit more from receiving the loss-related clue than the win-related clue. If a player learns which box contains “lose 1 cent” and then avoids this box, the expected value of the remaining boxes is 9.33 cents. In contrast, if a player is shown “win 5 cents,” the expected win is lower: 5 cents if the player stays with the original box, and 7.33 cents if the player switches boxes. Thus, participants who learn the location of the “lose 1 cent” box and avoid it will, on average, earn more money than participants who receive the “win 5 cents” clue.

5.15. Results

Supporting our primary hypothesis, 60% (58/96) of the participants shared the winning tip (“win 5 cents”), which was more than the 40% (38/96) of people who shared the losing tip (“lose 1 cent”), $\chi(1) = 4.17$, $p = .041$. Supporting our secondary hypothesis, the proportion of participants who shared the winning tip was significantly higher than the logical expected proportion of 0% of people sharing the “win 5” clue, $\chi(1) = 35.04$, $p < .001$.

5.16. Study 1f: Raising discrepancies in expected value

In Study 1e, the recipient's expected earnings after receiving a losing, versus a winning, tip were very close (5 or 7.33 cents for “win 5” versus 9.33 cents for “lose 1”). In Study 1f, we increased the disparity between the expected gains associated with the two clues. Notwithstanding this greater disparity, we expected participants to continue to (erroneously) choose to share winning clues with others.

5.17. Method

5.17.1. Participants

We recruited 100 participants on Prolific; Prolific returned 96 respondents (60.4% female; $M_{\text{age}} = 32.91$, $SD_{\text{age}} = 11.05$). See Study 1a for more recruitment details.

5.17.2. Procedure

The procedure was identical to Study 1e, except that the four boxes contained new values: (1) win 80 cents, (2) win 20 cents, (3) lose 1 cent, and (4) lose 2 cents. Following two rounds of the game, players learned the location of two boxes: “win 20 cents” and “lose 1 cent.”

Once again, the primary outcome was which box location the participant chose to share with the next participant. If a player passed along the losing clue (“lose 1 cent”) the recipient's expected win would be 32.67 cents. This is higher than the face value of the winning clue (20 cents), as well as the value of the expected win if the recipient of the winning clue switches boxes (25.67 cents). Thus, the losing clue has a higher expected value.

5.18. Results and discussion

Supporting our primary hypothesis, 64% (61/96) of participants shared the box with the winning tip (“win 20 cents”), which was more than the 36% (35/96) of people who shared the losing tip (“lose 1 cent”), $\chi(1) = 7.04$, $p = .008$. Supporting our secondary hypothesis, the proportion of participants who shared the winning tip was significantly higher than the logical expected proportion of 0% of people sharing the “win 20” clue, $\chi(1) = 38.76$, $p < .001$.

We conducted one final follow-up to ensure that lack of attention did not drive the results of Studies 1a-1f. Presumably, if participants do not pay attention, a given proportion of people (a third or a quarter, depending on the number of boxes) will always make the wrong choice. In this final study (recruited 50 participants on Prolific; Prolific returned 47 respondents), participants once again chose to reveal one of three boxes (\$-0.01, \$0.20, \$0.80) to themselves, as a clue, prior to the game. However this time, instead of telling participants to choose between the loss (\$-0.01) and the moderate win (\$0.20), participants chose between the loss (\$-0.01) and the large win (\$0.80). Data from two participants were excluded because they explicitly noted in their response that they believed the choice to be a trick (they did not believe that they would be allowed to reveal to themselves the \$0.80 clue prior to playing the game). As expected, 96% (43/45) of participants chose to see the large win (\$0.80), which did not differ from the logical expectation that 100% of participants would choose this clue, $\chi(1) = 0.09$, $p = .766$. Participants were also more likely to choose the win than the loss, $\chi(1) = 14.76$, $p < .001$.

In sum, the box game paradigm provides evidence that people undershare failure, even when it contains more information than the alternative. Across six studies, participants thought a moderate win (success) contained more information than a loss (failure), despite the fact that the failure contained objectively better information.

6. Study 2: Sharing failures less than neutral experiences

In Study 1, people were less likely to share failure than success; however, it is unclear whether this resulted from the reluctance to share failure (our hypothesis), or over-eagerness to share success. In Study 2, we disentangled these possibilities by evaluating whether students undershare failure when the alternative is sharing a feedback-free experience. Analogously, in work environments, people may undershare experiences in areas in which they have received information on their failures, choosing instead to share information on areas in which they have received no feedback (and have no way to gauge their performance).

Using a within-subjects design, students at a community college completed two quizzes. Both quizzes asked students to determine the meaning of a series of symbols. On one quiz, students received negative feedback on what they got wrong. Because each symbol question had two possible answers, participants could use the negative feedback (“Incorrect!”) to deduce the correct answer. On the other quiz, students received no feedback, which means they learned nothing about the symbols in question. Thus, as in Study 1, in Study 2, we designed the

task paradigm, so failure provided more information than the comparison experience.

Next, we asked participants on which of the two quizzes they had more information to share with future participants. We expected a significant number of participants (possibly the majority) to (erroneously) feel that they had more to share on the symbols on which they had received no feedback, compared to the symbols on which they had received negative feedback. Insofar as participants figured they were possibly right in the no-feedback condition, they might incorrectly conclude that they had more useful information to share on the questions on which they had received no feedback.

6.1. Method

6.1.1. Participants

Participants were 98 students (60.2% female; $M_{\text{age}} = 20.74$, $SD_{\text{age}} = 6.08$) in a community college lecture course who volunteered to complete “a thinking exercise” during class.

6.1.2. Procedure

The present experiment used a 2-condition (quiz: negative feedback vs. no feedback) within-subjects design. Each participant answered two question sets about a “researcher-manufactured ancient script” on his/her personal phone or laptop at the start of class. One question set (three questions) was about animals, and one question set (three questions) was about recreation. Each question (e.g., “Which of the following characters in an ancient script represents an underwater creature?”) was binary choice, which means participants chose from one of two symbols (e.g., A. “ψ” B. “π”). Participants completed the two sets in counterbalanced order. At the end of one of the 3-question sets, participants learned that there was no time to receive performance feedback: “Thank you for answering those questions. Unfortunately, we are short on time and can’t give you any performance feedback on this set.” Following the other 3-question set, participants received failure feedback: “Thank you for answering those questions. Our program just scored your responses. Unfortunately, your score was 0%.” Because there were only two answer choices to each question, failure feedback was informative. From this feedback, participants could deduce which of the two answer choices was correct. In contrast, participants learned nothing about the symbols on which they received no feedback.

Next, participants were invited to share information on one set of symbols: “Other students are about to learn about the ancient script you just read about. They want your help learning the symbols in one of the two sets you just completed. On which of these two sets do you have useful information to share about the symbol meanings?” Participants then chose whether they wanted to share information on the first or second set with others.

6.2. Results and discussion

In support of our hypothesis, 70% (69/98) of the student participants shared information on the no-feedback set, which is more than the 30% (29/98) of participants who shared information on the failure feedback set, $\chi(1) = 16.33$, $p < .001$. This demonstrates that people are reluctant to share failure (not simply overeager to share success).

Not only did a significant portion of participants share the no-feedback and hence, the no-information set—the majority of participants made this choice. We think participants did this because they failed to realize there was information in failure. Alternatively, participants may have opted out of sharing information related to the failure due to ego threat. To address this alternative possibility, in Study 3, we directly tested whether our proposed mechanism—the inability to see information in failure—explained undersharing.

7. Study 3: Correcting the imbalance

In Study 3, we aimed to bring evidence for the hypothesized process—that people do not share failure because they do not realize that failure contains useful information. As in Study 2, in Study 3, we once again randomized participants to receive failure feedback or no feedback on their answer choices. We further randomized participants to a highlighted or a non-highlighted condition. The non-highlighted condition was identical to Study 2. The highlighted condition highlighted the informational value of the failure feedback. We expected that highlighting the information in failure would increase peoples’ willingness to share it, thus moderating our effect. Alternatively, if the reason people do not share failure is because they are concerned about public image and self-esteem, we should see a similar reluctance to share failure whether it is informative or not.

7.1. Method

7.1.1. Participants

We recruited 100 participants on Prolific; Prolific returned 96 respondents (57.3% female; $M_{\text{age}} = 33.8$, $SD_{\text{age}} = 11.15$). See Study 1a for further recruitment details.

7.1.2. Procedure

This study used a 2 (Feedback: negative feedback vs. no feedback; within-participants) \times 2 (Highlighting: information not highlighted vs. highlighted; between-participants) mixed design. Upon signing in, all participants learned that they would answer two sets of questions about an ancient script. Participants in the non-highlighted condition completed the exact procedure described in Study 2. That is, they answered two question sets about a “researcher-manufactured ancient script”—one on which they received failure feedback, and one on which they received no feedback. In contrast, for participants in the highlighted condition, the failure feedback was accompanied by this message: “TAKE NOTE: there were only two answer choices to the question (copied below). Based on the feedback above, you can learn the correct answer! It is whichever choice you did not select initially.”

Next, participants chose to share information on one of the two question sets with others (see Study 2 for details).

7.2. Results and discussion

In the non-highlighted condition (replication of Study 2), 28% (13/46) of participants chose to share information on the failure set, which is less than the 72% (33/46) of participants who chose to share information on the no-feedback set: $\chi(1) = 8.70$, $p = .003$. See Fig. 1.

In contrast, in the condition that highlighted the information in failure, 76% (38/50) of participants chose to share information on the failure set, which was more than the 24% (12/50) of participants who chose to share information on the no-feedback set, $\chi(1) = 13.52$, $p < .001$. Using a chi-square test, we analyzed whether people in the highlighted condition were more likely to share failure (1 = sharing failure, 0 = sharing other experience) compared to people in the non-highlighted condition. They were, $\chi(1) = 21.93$, $p < .001$.

Study 3 brings initial evidence for the hypothesized process using moderation. Highlighting the information contained in failure increased peoples’ willingness to share it.

8. Study 4: Sharing teaching failures

In Studies 1–3, people undershared failure in experimental paradigms in which failure was objectively more informative than the comparison experience. In Studies 4–5, we shifted to examine whether people undershare failure in professional settings. In this second paradigm, we asked people to recall personal success and failure experiences and to share one of these experiences with others. Using recalled

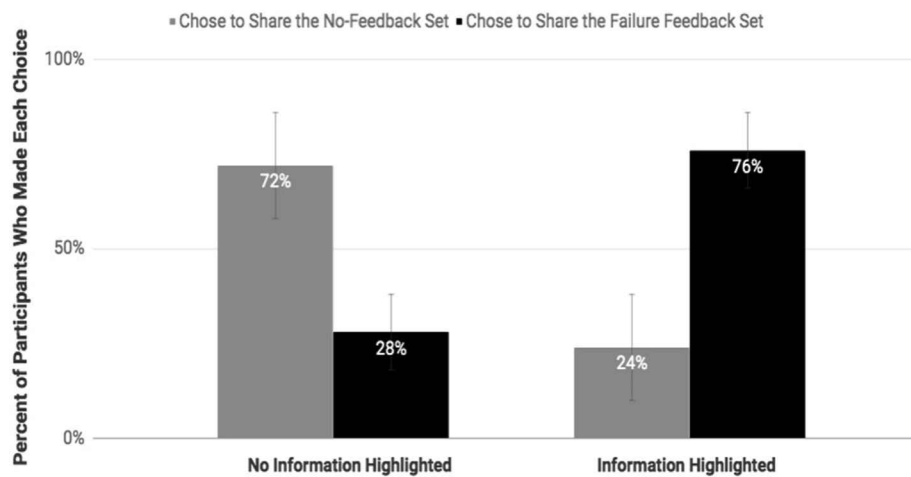


Fig. 1. The percent of participants who chose to share information related to failure feedback versus no-feedback in Study 3. When we highlighted the informational value of failure, participants were more likely to share information on the failure feedback set, compared to the no-feedback set. Absent such highlighting, participants were less likely to share information on the failure feedback set, compared to the no-feedback set. Each error bar represents the 95% confidence interval for the given proportion.

experiences, which naturally vary in informativeness (e.g., it could be that many success experiences are actually more informative than many failure experiences, or vice versa), we tested whether the tendency to undershare failure generalizes to everyday experiences.

Specifically, in this study, middle school teachers reflected on a recent professional failure and a recent professional success. Following this, teachers shared one of these experiences with other teachers, to help others learn. Sharing was anonymous, to mute self-enhancement motives. We expected teachers to share failure less than success.

8.1. Method

8.1.1. Participants

We partnered with a public school district in the northeast. The principal distributed a survey link to all teachers who were present during a professional development session. Teachers completed the survey on their mobile phones and/or computers. In total, 57 teachers participated; 51 of these teachers chose to share demographic information (64.9% female; $M_{\text{age}} = 44.12$, $SD_{\text{age}} = 12.70$).

8.1.2. Procedure

This study used a within-subjects design. First, teachers read a brief statement, which said that everything they shared would be kept anonymous. Following this, teachers reflected on a recent professional failure and a recent professional success, in counterbalanced order. The failure prompt read: “Reflect on a specific time when you FAILED in the workplace. Maybe you failed to accomplish a goal. Maybe you received negative feedback from a supervisor. Tell us about the experience.” In contrast, the success prompt read: “Reflect on a specific time when you SUCCEEDED in the workplace. Maybe you succeeded in accomplishing a goal. Maybe you received positive feedback from a supervisor. Tell us about the experience.” As an example, here was one teacher’s failure reflection: “My first year as a teacher, I spent hours creating my mid-term exam. I went to show it to my department chair, and was proud of what I had created. His constructive feedback was hard for me to swallow, as he explained a lot of my questions were recitation-esque questions, and not exactly analytical, and would probably result in a surfaced understanding of basic material.” In contrast, one success reflection read: “A time I succeeded in the workplace was when I presented during a PD session last year. Though I was only in my second year of teaching, I worked with experienced colleagues to develop the presentation and work with other teachers during the session. We got positive feedback and I think the other teachers used what we presented about.”

As the main outcome, teachers chose which of the two stories they wanted to share, anonymously, with teachers at other schools: “We want to share one of the lessons you just wrote about with other

teachers, to help them. Which of the lessons you wrote about today should we share to help them learn?”

8.2. Results and discussion

In support of our hypothesis, 68% (39/57) of teachers shared the success, which is more than the 32% (18/57) of teachers who shared the failure, $\chi^2(1) = 7.74$, $p = .005$. Thus, it appears that teachers assume success is more informative than failure. To gather evidence for the generalizability of this phenomenon, in a follow-up study ($N = 130$; reported in supplemental materials), we replicated the main effect in the health domain. We recruited individuals trying to lose weight, and had them describe a recent dieting failure and a recent dieting success. Once again, sharing was anonymous. As predicted, 62% (80/130) of overweight participants thought it would be more helpful to share successes, which is more than the 38% (50/130) of participants who chose to share failures, $\chi^2(1) = 6.24$, $p = .01$.

As noted in the introduction to this study, a key limitation of the design is that recalled experiences vary naturally in informativeness. It is possible that the success experiences teachers recalled actually *were* more informative than the failure experiences, because people are generally more likely to attribute successes (vs. failures) to internal—i.e., controllable—causes (Weiner, 1971). To address this possibility, we had two coders rate whether each of the teachers’ self-reported successes and failures were due to uncontrollable (=0) or controllable (=1) causes. The average controllability ratings of successes ($M = 0.86$, $SD = 0.28$) versus failures ($M = 0.76$, $SD = 0.35$) did not differ, $t(56) = 1.63$, $p = .11$. Nevertheless, because coders directionally rated success stories to be more controllable, we ran Study 5 to test for direct evidence that our proposed mechanism—peoples’ inability to see information in failure—accounted for the tendency to undershare failure in this paradigm.

9. Study 5: Failures at work seems less informative and therefore go unshared

In Study 5, we tested whether the target mechanism—people do not realize there is information in failure—as well as a possible alternative mechanism—failure undermines self-esteem—underlie the tendency to undershare failure. First, in Study 5a, participants reflected on things they did that either helped (success condition) or hurt (failure condition) their ability to focus while working. They then reported the extent to which each recalled experience (a) contained useful information and (b) undermined their self-esteem (the potential mediators). Finally, they reported on their willingness to share the experience with others. Measuring two potential mediators in one study enabled us to test whether the inability to see information in failure accounted for

undersharing independent of self-esteem considerations.

Next, in Study 5b, we minimized self-esteem considerations by measuring peoples’ willingness to share a failure experience back with themselves—that is, we measured participants’ willingness to remind themselves of a personal failure (versus success) at some future date. We assumed that this new variable—the willingness to share with oneself—would mute any self-enhancement concerns that might have driven peoples’ decisions about what to share with others.

9.1. Study 5a

9.1.1. Method

9.1.1.1. *Participants.* We recruited 200 participants on MTurk. MTurk returned 200 respondents (52.0% female; $M_{age} = 38.88$, $SD_{age} = 11.25$). See Study 1b for recruitment details.

9.1.1.2. *Procedure.* The present experiment used a 2-condition (failure vs. success) between-subjects design. Participants were randomized to reflect on the last time they failed or the last time they succeeded in concentrating at work. Participants in the failure condition read: “In the box below, tell us about the last time you failed to focus at work. Maybe you were distracted by texts on your phone. Maybe you went down a rabbit hole on the internet.” In contrast, participants in the success condition read: “In the box below, tell us about the last time you succeeded in focusing at work. Maybe you were completely absorbed by a task. Maybe you turned off your phone so you wouldn’t be distracted.”

Next, participants rated their reluctance to share the experience with others (“The work experience I just reflected on...” “...is not something I want to talk about with others” “...is not something I want to share with others,” “...is not something others would benefit from knowing about”; $\alpha = 0.87$) using 7-point Likert scales (1 = *strongly disagree*, and 7 = *strongly agree*). Scores on these three items were averaged together to create a single measure of the participant’s reluctance to share.

Afterwards, participants rated themselves on two hypothesized mediators: learning and self-esteem. We measured these mediators following the dependent variable, to ensure that they did not influence feelings about sharing. The learning items assessed the degree to which participants felt they did *not* learn from the experience (“The work experience I just reflected on...” “...was not edifying,” “...was not instructive,” “...was not educational”; $\alpha = 0.88$) using 7-point Likert scales (1 = *strongly disagree*, and 7 = *strongly agree*). Scores on these three items were averaged together to create a single measure of learning. The self-esteem items assessed the degree to which the reflection exercise made participants feel bad about themselves (“The work experience I just reflected on...” “...made me feel bad about myself,” “...hurt my self-esteem,” “...lowered my sense of self”; $\alpha = 0.95$) using 7-point Likert scales (1 = *strongly disagree*, and 7 = *strongly agree*). Scores on these three items were averaged together to create a single measure of self-esteem.

9.2. Results and discussion

In support of the hypothesis, participants were more reluctant to share the failure-related experience, compared to the success-related experience ($M_{failure} = 4.43$, $SD = 1.70$; $M_{success} = 3.50$, $SD = 1.75$), $t(198) = -3.84$, $p < .001$. Failure also affected the mediators in the predicted directions. Participants agreed that they had learned less from failure than success ($M_{failure} = 4.34$, $SD = 1.61$; $M_{success} = 2.51$, $SD = 1.71$), $t(198) = -7.82$, $p < .001$, and reported that failure lowered their self-esteem more than success ($M_{failure} = 3.11$, $SD = 1.81$; $M_{success} = 1.90$, $SD = 1.56$), $t(198) = -5.01$, $p < .001$.

Next, we tested whether feelings of learning, and/or self-esteem mediated the effect of condition (failure vs. success) on sharing. In a first model that only included judgments of lack of learning as a potential mediator, judgments of lack of learning were associated with not

wanting to share the experience, even after controlling for condition ($\beta = 0.49$, $p < .001$). As hypothesized, judging the experience to be uninformative mediated the effect of condition on not wanting to share the experience ($\beta_{indirect} = 0.90$, $SE = 0.17$, 95% CI [0.59, 1.24]; based on 10,000 bootstrap samples).

In a second model that only included self-esteem as a potential mediator, self-esteem was associated with not wanting to share the experience, even after controlling for condition ($\beta = 0.37$, $p < .001$). Feelings of low self-esteem mediated the effect of condition on not wanting to share the experience ($\beta_{indirect} = 0.45$, $SE = 0.12$, 95% CI [0.24, 0.67]; based on 10,000 bootstrap samples).

Finally, we ran a model in which both judgments of lack of learning and self-esteem were included as potential mediators. In this joint model, judgments of lack of learning ($\beta = 0.40$, $p < .001$) and self-esteem ($\beta = 0.17$, $p = .021$) were associated with not wanting to share the experience, even after controlling for condition. In this final model, both judgments of lack of learning ($\beta_{indirect} = 0.74$, $SE = 0.17$, 95% CI [0.41, 1.10]; based on 10,000 bootstrap samples) and self-esteem ($\beta_{indirect} = 0.21$, $SE = 0.10$, 95% CI [0.04, 0.40]; based on 10,000 bootstrap samples) mediated the effect of condition on not wanting to share the experience.

Next, we used structural equation modeling to test the relative fit of the two potential mediators. Good fitting models should have a non-significant χ^2 value, CFIs greater than 0.95, and RMSEA less than 0.06. Models with the low AIC values are preferred.

We tested Goodness-of-Fit statistics for three models. First, a model that had the joint mediating effects of the two mediators. Second, a model with the single mediating effect of self-esteem. Third, a model with the single mediating effect of learning. See Table 2 for Goodness-of-Fit Indices for all three models. The first model was a poor fit, and the second model was a better fit, but still inadequate. Only the third model exhibited good model fit. See the Supplement for full details on the path coefficients in each of these models.

In this study, failure affected both perceptions of information and self-esteem. Nevertheless, it appears that the inability to perceive the information in failure underlay the effect on undersharing.

9.3. Study 5b

In Study 5b, we aimed to replicate Study 5a using a design that minimized self-enhancement concerns. That is, instead of asking participants about their willingness to share failure with others, we asked them about their willingness to share a failure back with themselves. We expected people would be reluctant to share personal failure with their future selves for the same reason they are reluctant to share failures with others: because they do not realize failures contain useful information.

9.3.1. Method

9.3.1.1. *Participants.* We recruited 200 participants on MTurk. MTurk returned 200 respondents (46.0% female; $M_{age} = 37.10$, $SD_{age} = 10.79$). See Study 1b for recruitment details.

Table 2
Goodness-of-fit indices for three SEM models using MPLUS.

Model	df	χ^2	CFI	RMSEA	AIC
Model 1 (Joint mediators)	1	57.31*	0.72	0.53	2293.83
Model 2 (Self-esteem only)	1	4.13*	0.95	0.13	1547.38
Model 3 (Learning only)	1	0.02	1.00	0.00	1514.25

Note. Criteria used to determine good model fit: CFI greater than 0.95. For RMSEA, 0.06 = good fit, < 0.08 = reasonable fit, < 0.10 = poor fit; For AIC, model with the smallest value is regarded as the best fitting model.

* Significant χ^2 ($p < .05$) indicate lack of fit.

9.3.1.2. Procedure. The present experiment used a 2-condition (failure vs. success) between-subjects design. Participants were randomized to reflect on the last time they failed or the last time they succeeded in concentrating at work. See Study 5a for details.

Afterwards, participants rated the degree to which they did *not* learn from the experience (“The work experience I just reflected on...” “... was not edifying,” “...was not instructive,” “...was not educational”; $\alpha = 0.88$) using 7-point Likert scales (1 = *strongly disagree*, and 7 = *strongly agree*). Scores on these three items were averaged together to create a single measure of learning. Using the same scale, participants rated their reluctance to share the experience with their future selves (“The work experience I just reflected on...” “...is not something I want to be reminded of in the future” “...is not something I want to have shared back with me in the future,” “...is not something I would benefit from being told about in the future”; $\alpha = 0.82$). Scores on these three items were averaged together to create a single measure of sharing.

9.3.2. Results and discussion

In support of the hypothesis, participants were more reluctant to share the failure-related experience, compared to the success-related experience ($M_{\text{failure}} = 4.59$, $SD = 1.56$; $M_{\text{success}} = 3.20$, $SD = 1.45$), $t(198) = -6.54$; $\beta = 1.39$, $p < .001$. Participants also indicated greater agreement with the items measuring lack of learning in the failure condition than in the success condition ($M_{\text{failure}} = 4.41$, $SD = 1.78$; $M_{\text{success}} = 3.26$, $SD = 1.59$), $t(198) = -4.85$; $\beta = 1.16$, $p < .001$.

Next, we tested whether the judgment that one had not learned mediated the effect of condition (failure vs. success) on sharing. Judgments of lack of learning were associated with not wanting to share the experience back with oneself, even after controlling for condition ($\beta = 0.59$, $p < .001$). As hypothesized, judging the experience to be uninformative mediated the effect of condition on not wanting to share the experience ($\beta_{\text{indirect}} = 0.68$, $SE = 0.15$, 95% CI [0.39, 1.02]; based on 10,000 bootstrap samples).

Together, the results of Study 5 provide support for the hypothesized process. People undershare failure because they do not see information in failure—an effect that holds over and above any effects that self-esteem has on undersharing.

10. General discussion

Information on failures is a public good. When it is shared, society wins. For example, when researchers share failed studies, science makes progress. Yet across five studies (involving eleven samples), people were reluctant to share information they had learned from failure—knowledge about failed actions did not transfer to the group. We first observed this reluctance in controlled task environments in which we engineered failure to be objectively more informative than a comparison experience (Studies 1–3). Even though failures contained the most useful information, a significant proportion of people consistently overlooked this. The reluctance to share failures also occurred in the workplace. Teachers were less likely to tell other teachers about their professional failures compared to their professional successes (Study 4), and employees were less likely to share information about their failed versus successful attempts to concentrate in the workplace (Study 5).

Why are people reluctant to share failure? Across both failure paradigms, people did not realize that failure contained useful information. As a result, highlighting the information in failure attenuated the effect on undersharing (Study 3). Moreover, the inability to see the information in failure mediated the effect on undersharing (Study 5).

10.1. Implications and future directions

When people undershare information it affects the quality of group knowledge. Social sharing is one of the key routes by which people

obtain information. If people do not share information on failure experiences and failed programs, this knowledge does not transfer to the group. There are several reasons why such undersharing might occur. First, people may tend to pay attention to success, but ignore failure. Second, people may be driven to self-enhance—to communicate successes over failures, in order to project a positive self-image. Third, there may be objectively more information in success than failure (e.g., when success is rarer).

In the present investigation, we bring evidence for a fourth possibility: that people undershare failure because they do not realize that failure contains useful information. In experimental paradigms, we find that people share success-related information over failure-related information even when the success-related information is objectively less useful to the recipient—for example, when failure is rarer, and therefore, more informative. While it is still possible that people often do not see the information in failures because they do not attend to failures or because failures threaten their self-esteem, we designed studies in which people could not ignore the information in failure, and studies in which self-enhancement motives were removed. Even in these circumstances, people continued to not see and therefore, to undershare, the information in failure.

Why do people fail to see the information in failure? Likely, because doing so is cognitively difficult. Whereas the information in success is directly instructive—it highlights a correct action one should repeat in the future—the information in failure is more oblique. Failure is only informative if people take the mental step to deduce what an incorrect response teaches about the correct response. Given people’s tendency to be cognitive misers (Stanovich, 2009), we hypothesize that they missed the information in failure, and as a result, undershared it with others.

Another reason people may overlook the information in failure is because they attribute failure to uncontrollable causes (Weiner, 1971). If people perceive failures to be out of their control, because failures are not aligned with peoples’ intentions, then they may conclude that failures contain less information than successes, which they perceive as more controllable. This explanation may be particularly relevant to understanding peoples’ sharing of everyday successes and failures (Studies 4–5). In our studies, everyday failures were not rated as objectively less controllable by raters; nevertheless, participants may have been motivated to attribute failures to uncontrollable causes, which could explain why they saw failure as less informative than success, and were less likely to share it with others.

In the current investigation, we calibrated the incidence of failure and success in order to make failure rarer. As a result of being rarer, failure was more informative, yet participants, who did not realize this, hesitated to share failure. We acknowledge that this experimental paradigm does not approximate many real-world situations—situations in which failure contains less information than success. For example, among novices, failure is often more common than success. When success is rarer, it is more informative, and as a result, we expect people, correctly, to prefer to share more informative successes over less informative failures. It is also true that many failures are due to bad luck or happenstance—in other words, external uncontrollable causes. In these circumstances, we expect people, again, correctly, to see more information in internally-attributed, controllable successes than externally-attributed uncontrollable failures, and as a result, to share failure less than success. It stands to reason that, generally, people will share informative failures more than uninformative failures. We do not argue that people are completely insensitive to the amount of information in failure. Rather, our claim is that even when there is information in failure, people overlook it, and as a result, undershare it with others.

The tendency to undershare failure has organizational implications. In social groups in general, and in organizations in particular, fluid knowledge transfer predicts better performance (Mesmer-Magnus & DeChurch, 2009), just as stymied knowledge transfer undercuts performance (Sunstein & Hastie, 2015). Researchers who study knowledge

transfer have traditionally focused on how the fluid transfer of *best practices* improves organizational performance (Holdt Christensen, 2007; O'Dell & Jackson Grayson, 1999). We add to this literature by illuminating how people share the opposite kind of knowledge—knowledge about worst practices, or failures. It stands to reason that when worst practices and failures are undershared, this may have deleterious effects on overall performance. Learning vicariously from others' failures is a safe way to learn from costly, risky actions (Bandura, 1961). If employees do not share information about things that have gone wrong, others will not know what professional mistakes to avoid, and they are likely to repeat them. Our results highlight the need for future research that focuses on the extent to which failures are (or are not) shared in organizational settings, and how this affects organizational performance.

11. Conclusion

Learning about others' failures is a costless, risk-free way to learn from actions that are both costly and risky. Yet people find the lessons of failure less apparent than the lessons of success. As a result, this information is lost to the social group; people cannot learn from the failures of others. Insofar as the learning value of failure is less apparent to people than the learning value of success, it is critical to find ways to highlight the information in failure—so that people see it and share it with others.

Declaration of Competing Interest

None

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.obhdp.2019.11.007>.

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