Happy Thoughts:

The Role of Communion in Accepting and Sharing Misbeliefs

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Abstract

The negativity bias favors the cultural diffusion of negative misbeliefs, yet many common misbeliefs—naturopathy works, there’s a heaven—are positive. Why? People might share ‘happy thoughts’—beliefs or misbeliefs that might make others happy—to display a high degree of communion (i.e., niceness, kindness). Across seven experiments ($N = 3855$) we found that among Japanese and English participants: (i) people higher on communion are more likely to believe and share happier beliefs, by contrast with people higher in agency (i.e., competent, dominant); (ii) when they want to appear nice and kind, rather than competent and dominant, people avoid sharing sad beliefs, and instead prefer sharing happy beliefs; (iii) sharing happier beliefs instead of sad beliefs leads to being perceived as nicer and kinder; and (iv) sharing happy beliefs instead of sad beliefs leads to being perceived as less dominant. We also found a positive bias with happier beliefs being more likely to be shared and believed. Overall, these results suggest that one reason why happy misbeliefs could spread, despite a general negativity bias, is because they allow their sender to signal niceness and kindness.

Keywords: misbeliefs; communion; reputation management; cultural evolution; negativity bias; positivity; happy.

1. Introduction

The world around, most people hold some misbeliefs, such as paranormal, conspiracy, or pseudoscientific beliefs. For instance, 84% of the world's population believe in god(s) (Hackett et al., 2017), and nearly 40% of Americans think that some cancers can be cured solely through the use of complementary and alternative medicines (American Society of Clinical Oncology, 2018). A smaller share of people believe that some special rocks have healing powers, that lizards control the world, or that climate change is a hoax orchestrated by the Chinese government. Why do so many people hold and share such beliefs? In this article, we focus on a specific feature of misbeliefs that might help explain their cultural success: how 'happy' they are, that is, whether people think holding such beliefs makes people happy or sad.

A large literature shows that people exhibit, in many areas, a negativity bias: they are more likely to attend to (Baumeister et al., 2001), remember (Bebbington et al., 2017; C. J. Walker & Blaine, 1991), share (Acerbi, 2021; Heath, 1996), and even believe (Fessler et al., 2014; Hilbig, 2009, 2011, 2012) more negative information. This negativity bias has been used in cultural evolution to explain, for instance, the persistence and prevalence of stories about negative events (e.g. Bebbington et al., 2017; Schöne et al., 2021). Applied to misbeliefs, the negativity bias leads to the prediction that most misbeliefs should be negative, in particular if they bear on threats (Blaine & Boyer, 2018); indeed, many common misbeliefs are negative: beliefs about agents that can harm us supernaturally (witches, etc.), for instance, are extremely common worldwide (e.g. Hutton, 2017).

The negativity bias, however, is not always the dominant force. First, there is substantial variability in how much negativity bias participants evince, as a function of their personality and of the circumstances (Soroka & Krupnikov, 2021). In some domains, there even appears to be a systematic positivity bias: Natural human languages across the world are characterized by a positivity bias (Dodds et al., 2015); More positive articles of the *New York Times* are more

likely to be shared via email (Berger & Milkman, 2012; see also: Bright, 2016); On some popular Facebook sites, positive phatic posts generate more engagement than negative posts (Berriche & Altay, 2020); People share more often and with more fidelity morally good content compared to morally bad content (Stubbersfield et al., 2019).

If, on some level, the positivity bias might help explain the cultural success of happy thoughts, it is obviously unsatisfactory to be in a position to predict that both happy and sad thoughts are going to spread better than each other, due to, respectively, the positivity and the negativity bias. One potential way to reconcile these two biases would be to postulate that they mostly act on different stages of cultural transmission. For instance, some data suggest that people are more interested in negative information, but more eager to share positive information (Berger & Milkman, 2012; Bright, 2016). However, other data suggests that the negativity bias sometimes also prevails in transmission (e.g. Acerbi, 2021; Heath, 1996). There must thus be other factors that explain why a given bias prevails in some circumstances but not others. Here, we suggest that whether the negativity or the positivity bias dominates in cultural transmission depends on contextual factors (for a similar view, see, Fay et al., 2021), in particular the impression that people want to convey when they transmit information.

Our main thesis is that positive misbeliefs—which we characterize here as beliefs that tend to make people happy—can compete against negative misbeliefs and become culturally successful because they are associated with communion—how nice people are perceived to be. People spontaneously and effortlessly evaluate the extent to which others are nice, or, more broadly, whether others have good intentions toward them. These impressions about others' niceness are taken to be universal and to represent the most fundamental dimension of social cognition, playing a paramount role in a wide variety of social decisions (Abele & Wojciszke, 2007; Fiske et al., 2007; Wojciszke, 1994). Conveying to others the impression that we are nice, that we have good intentions towards them, is therefore expected to be a prime target of self-

enhancement and impression management strategies (see, e.g., Abele & Wojciszke, 2014; Leary, 1995; Sedikides et al., 2003).

If happier misbeliefs can be used to display one's niceness, this leads to the following hypotheses, which are explained in greater details and tested below: (i) people who report being nicer (compared to people who report being less nice) are more likely to hold and share happier misbeliefs, (ii) happier misbeliefs are more likely to be shared when one's goal is to appear nice, (iii) sharing happier misbeliefs makes one look nicer, and (iv) sharing happier misbeliefs makes one look less dominant. Seven online experiments conducted among English and Japanese participants ($N = 3855$) offer support for these hypotheses. Japan is a particularly interesting test for the present hypotheses since some findings from Western samples regarding the propensity to accept misbeliefs did not replicate in Japan (Karasawa & Tsukimoto, 2010; Majima, 2015; Majima et al., 2020).

In the remaining of the introduction, we lay out the theoretical foundations of the present research, briefly review some of the psychological mechanisms that have been invoked to explain the cultural success of misbeliefs, introduce more thoroughly the framework of agency and communion on which we rely, and finally state our hypotheses.

Theoretical foundations

What does it take for a misbelief to become widely and durably distributed in a human population? The literature in cultural evolution has identified three key ingredients determining the cultural success of a belief (Eriksson & Coultas, 2014; Sperber, 1996). First, the belief needs to be accepted (to some extent), or at *minima* not rejected outright. It thus needs to appear sufficiently plausible. Second, the belief needs to be easy to memorize, even though this requirement is particularly stringent in oral transmission (Acerbi, 2020). Third, and crucially, the belief needs to be shared (Morin, 2015). Regardless of how plausible and easy to memorize

a misbelief might be, it will not spread widely or durably if only a few people are willing to share it with others. In the present manuscript, we focused on the two ingredients that are thought to play a disproportionate role in today's digital environment: acceptance (i.e. how plausible is the belief?), and transmission (i.e. how willing people are to share the belief?).

Social scientists have built many theories and postulated the existence of numerous cognitive pathways responsible for the cultural success of misbeliefs. These theories can be divided in two broad categories. The first focuses on individual differences: i.e. what makes some people more likely than others to hold misbeliefs? The other category focuses on the content of the beliefs: i.e. what makes a particular content more likely to spread than another?

Individual differences

Social scientists have long suspected that we are not all equal in the propensity to accept misbeliefs (for review, see, e.g. Mercier, 2020). While many factors have been suggested as predicting or explaining differences in this propensity (for instance, the tendency to see too many patterns, illusory pattern perception, van Prooijen et al., 2018; van Prooijen, 2019; A. Walker et al., 2019), one is currently attracting substantial attention: whether one is more likely to rely on intuitive or on analytical thinking (e.g. Pennycook et al., 2015; Pennycook & Rand, 2018). Relying more on intuitions instead of engaging in analytical thinking has been associated with a higher likelihood of holding a variety of misbeliefs, of sharing fake news, and of finding pseudo-profound bullshit profound (Čavojová et al., 2019; Pennycook & Rand, 2018; Šrol, 2020). Within this framework, people come to hold misbeliefs because they are unable or unwilling to use analytical thinking abilities (Lantian et al., 2020). Thus, the adoption and the sharing of epistemically suspect beliefs is largely regarded as a mistake, a mistake that people would be less likely to make if they were more willing and able to think analytically. A salient example is the sharing of fake news. In the U.S., people higher in

analytical thinking are more likely to spot fake news, and less likely to share it (Pennycook & Rand, 2018, 2019). However, it is not clear whether the link between intuitive thinking and the acceptance of misbeliefs is universal. For example, in Japan, analytical thinking has been found to be either unrelated to, or to be a positive predictor of misbeliefs (Karasawa & Tsukimoto, 2010; Majima, 2015; Majima et al., 2020).

Content differences

Why are a few misbeliefs embraced by a large share of the public, while most remain confined to small fractions of the population or fail to spread at all? Some contents are more appealing to human minds than other. For instance, social information—i.e. information about others—is notoriously catchy. That is, people selectively attend to, and preferentially share, social information compared to non-social information (Mesoudi et al., 2006; Stubbersfield et al., 2015). Thus, *ceteris paribus*, a belief is more likely to become cultural if it contains a piece of social information. Similarly, it has been suggested that minimally counter-intuitive beliefs—i.e. beliefs that mostly fit with our intuitive cognitive mechanisms, while differing in a small number of ways—are particularly easy to memorize, which would explain the cultural success of, for instance, beliefs in supernatural agents such as ghosts (which are processed as human agents with a few special properties, see Boyer, 2001). Explanations in terms of intuitive biases towards different contents have been offered for the success of various misbeliefs, from the efficacy of bloodletting (Milton et al., 2015), to disgusting and surprising fake news (Acerbi, 2019; Vosoughi et al., 2018). The negativity and positivity bias, discussed earlier, are also part of the intuitive biases that can affect cultural transmission (Acerbi, 2021; Stubbersfield et al., 2019).

Besides being more attention-grabbing, or easier to memorize, the content of a belief can also facilitate its cultural success by motivating people to share it. For instance, some

information becomes widespread because sharing it allows people to reinforce social bonds, or to make others laugh (e.g., Berriche & Altay, 2020; Duffy & Ling, 2020). Arguably, one of the most important motivations for sharing information is impression management. Even misbeliefs can be used in this manner: people might share fake news to signal their political identity (Guess et al., 2019; Mourão & Robertson, 2019; Shin & Thorson, 2017), they might sharing threat-related rumors to signal their competence (Blaine & Boyer, 2018; Boyer & Parren, 2015), or they might share false and offensive rumors to display their dominance (de Araujo et al., 2020).

Here, we suggest that happy misbeliefs might be used to signal one's high degree of communion, or positive intentions towards the audience, such that we expect an interaction between specific individuals/contexts (individuals who are higher in communion, or who want to appear so), and specific contents (happier misbeliefs). Most studies that have examined the effects of the content of misbeliefs have not systematically investigated such individual differences. One exception is a recent article suggesting that the higher propensity of older individual to share fake news isn't due to an inability to spot them—on the contrary, older individuals are better at doing so (Brashier & Schacter, 2020). Instead, older individuals would be more likely to use fake news to create social bonds. There would thus be an interaction between an individual difference (in the importance of creating social bonds), and a content (fake news that is particularly likely to achieve this end). It is such an interaction that we hypothesize here, as we suggest that nicer people (individual difference) are more likely to share and believe happier misbeliefs (content difference).

Agency and Communion

Perceptions of personality are often arranged along two main dimensions: communion and agency (Abele & Wojciszke, 2007; Bakan, 1966), which are robust super-factors of the Big

Five capturing people's perceptions of others, of groups, and of themselves (DeYoung, 2006; Paulhus & John, 1998; Saucier, 2009). Agency refers to perceived abilities, such as intelligence, competence, leadership, and creativity, whereas communion captures perceived intentions, such as morality, sincerity, empathy, friendliness, and helpfulness. Various labels have been used in the literature, such as intellectual and social desirability (Rosenberg & Sedlak, 1972), warmth and competence (Fiske et al., 2002), dominance-nurturance (Wiggins, 1979), intellectual goodness-social goodness (Rosenberg et al., 1968), power-benevolence (Leach et al., 2007), and competence-morality (Phalet & Poppe, 1997; Wojciszke, 1994). These various labels refer to a similar underlying pattern of personality traits (Abele, Cuddy, et al., 2008; Judd et al., 2005).

Communion and agency are claimed to be universal dimensions of social cognition (Fiske et al., 2002, 2007), which explain most of the variance in the perception of everyday social behaviors (Wojciszke et al., 1998), and play a central role in assessing the value of cooperation partners in biological markets (Barclay, 2013). Notably, communion primes over agency in person perception (Abele & Wojciszke, 2014): we form impressions of communion (e.g. trustworthiness) faster than impressions of agency (Abele & Bruckmüller, 2011), and communion explains the lion's share of the variance in trait ratings (Abele & Wojciszke, 2007). In addition, communion is considered more important than agency in self-enhancement: "People realize that communal characteristics are more vital for their approval from others than their agentic ones and, consequently, tend to build, maintain, and repair their reputation mainly in the domain of communion." (Abele & Wojciszke, 2014, p.213; see also, Suitner & Maass, 2008; Ybarra et al., 2012).

Given the benefits in being perceived as high in communion, people engage in a variety of reputation management strategies to reach this goal (for reviews, see, Leary, 1995; Sedikides et al., 2003). As noted above, assenting to and sharing beliefs is a common reputation

management strategy: for instance, people appear more willing to share threatening content as this leads them to being perceived as more competent (i.e. higher in agency) (Blaine & Boyer, 2018; Boyer & Parren, 2015; on the social function of beliefs more generally, see, Kurzban, 2012; Williams, 2019).

Some research already suggests associations between assenting to and sharing specific kinds of beliefs and higher communion. In some cultures, religious people are perceived as being higher in communion; in these cultures, people display religious badges, likely in part to appear higher in communion (McCullough et al., 2016). More generally, women, who tend to score higher than men on communion (Costa Jr et al., 2001), use warmer words than men (Leaper & Ayres, 2007; Park et al., 2016).

Besides religious badges—which can include religious beliefs (Gebauer et al., 2013)—other types of beliefs might be used to signal a high degree of communion. The main characteristic of communals (people who are high in communion) is that they have positive intentions towards others, they want others to be happy (Fiske et al., 2007). Some beliefs make people happier than others: some stories, facts, hypotheses, etc. are uplifting, others are depressing. There are two reasons why communals should be spontaneously more inclined to assent to and share ‘happy thoughts’ (i.e. beliefs that make those who hold them happy). First, such beliefs might simply accomplish one of their goals: making other people happy, such as reassuring a terminal patient that they will go to heaven. Second, such beliefs can signal communals’ willingness to make others happy, and thus their high degree of communion.

People who are low in communion, however, might stand to benefit from being perceived as being high in communion. Still, we believe there are two reasons why it is mostly communals who should be keen on displaying high communion. First, being perceived as high in communion is not always positive, as it can run counter to one’s goal of being

perceived as agentic and, more specifically, dominant (Oliveira et al., 2019; Tracy & Beall, 2011). Second, to the extent that the beliefs people use as signals of high communion are stable, they should be, on average, honest (e.g. Maynard Smith & Harper, 2003; Sperber et al., 2010). This means that people who are genuinely higher in communion should be more likely to broadcast such signals (for instance because people who broadcast signals of high communion while being low in communion end up suffering reputationally).

Here, we hypothesize a relation between communion and the propensity to assent to and share beliefs that make their holder happy, but we do not attempt to disentangle the different explanations for this link, in particular whether communals simply want to make others happy, or want to signal their high degree of communion (two mutually compatible explanations).

Overview of the hypotheses

The first hypothesis that will be tested is that misbeliefs that are happier (i.e. judged as making their holders happier) are more likely to be shared and believed by people higher in communion.

H₁: Participants who are higher in communion are more likely to agree with, and share happier beliefs (interaction term). This is not the case for participant higher in agency.

If communion is the main factor explaining why people believe and share happier beliefs, we should predict no main effect of personality, or of beliefs' happiness when taking into account the interaction between the two:

H_{1a}: Participants' score on the agency and communion scales are not significant predictors of sharing, and agreement with the beliefs, independently of the beliefs' happiness.

H_{1b}: The beliefs' happiness isn't a significant predictor of sharing or agreement with the beliefs, independently of participants' scores on the agency and communion scales.

Note, however, that if these hypotheses are falsified, it only means that factors besides communion are necessary to explain the success of happy beliefs, not that communion doesn't play the hypothesized role (as tested by H₁). Figure 1 offers a visualization of H₁ and H_{1a-b}. We make no specific prediction regarding the veracity of the (mis)beliefs: if nearly all of our stimuli are misbeliefs, it is only because we are interested here in the spread of this type of beliefs.

Next, we turn to whether, regardless of their personality, participants' propensity to share happy or sad misbeliefs is modulated by the type of impression they want to convey. If one reason why people agree with and share happier statements is self-enhancement or impression management, we should expect sharing to be sensitive to one's goal:

H₂: Participants, regardless of their score on the agency and communion scales, are more likely to share happy beliefs compared to sad beliefs when wanting to appear nice and kind than when wanting to appear competent and dominant.

Here we do not argue that sharing happy beliefs is better than other alternative ways of appearing nice and kind (e.g. giving someone a hug), but simply that it is better than sharing sad beliefs .

Turning from the senders' perspective to the receivers', we hypothesize that someone who shares happy beliefs, compared to someone who shares sad beliefs, or to a generic individual, should be perceived as more communal. Related evidence suggests that speakers sharing messages framed in a narrative format appear warmer and are selected more often to

participate in cooperative tasks compared to speakers using a statistical framing (Clark et al., 2019).

H₃: People sharing happy beliefs appear higher in communion compared to people sharing sad beliefs, and to a generic individual.

Finally, if sharing happy beliefs can be used as a signal of high communion, there must be some mechanisms that ensure this signaling isn't abused—otherwise everyone could lead others to believe they are high in communion, whether they are or not. One possibility is that sharing happy beliefs also has consequences that some would see as negative, in particular being perceived as less dominant (Oliveira et al., 2019; Tracy & Beall, 2011). As a result, it should be mostly people who genuinely care more about being perceived as high in communion rather than high in dominance who share happy beliefs for signaling purposes.

H₄: People sharing happy beliefs appear lower in dominance compared to people sharing sad beliefs, and to a generic individual.

Overview of the experiments

The first two experiments aimed at establishing the association between communion and the adhesion to and sharing of happy misbeliefs. Experiment 1 tested the hypothesis that people higher in communion are more likely to agree with and share happier beliefs (H₁). Participants were presented with a variety of misbeliefs—including paranormal beliefs, ontological confusions, and fake news, but also real news—and asked to rate the extent to which they agreed with each belief, how willing they were to share it, and how happy it would make someone who believes in it. Experiment 2 tested a variant of H₁ with pseudo-profound bullshit. The tendency to find pseudo-profound bullshit profound has been associated with higher receptivity to misbeliefs (Bainbridge et al., 2019; Čavojová et al.,

2019; Pennycook et al., 2015). Participants were presented with either happy or sad pseudo-profound bullshit, and asked to rate how profound they found the statements and how happy it would make someone who found them profound.

Experiments 3 and 4 investigated the influence of impression management goal on the propensity to share (mis)beliefs. We predicted that people would prefer sharing happier misbeliefs when wanting to appear nice and kind, compared to competent and dominant (H_2). In both experiments participants were told that they had to convey an impression (appearing nice and kind or competent and dominant). In Experiment 3, participants were presented with pairs of misbeliefs (one sad and one happy) and had to choose which one they would rather share to convey the desired impression. In Experiment 4, participants were presented with each belief individually and had to say how willing they would be to share it.

Experiments 5, 6, and 7, tested the hypothesis that people sharing happy misbeliefs are perceived as higher in communion than people sharing sad misbeliefs, and than a generic individual (H_3). In Experiment 5, participants were asked to evaluate the personality of a generic individual, or of someone who shared either happy or sad misbeliefs. Experiment 6 replicated the results of Experiment 5 with novel words from the agency-communion scale and tested the hypothesis that people sharing happy misbeliefs are perceived as lower in dominance than people sharing sad misbeliefs, and than a generic individual (H_4). Experiment 7 investigated whether the results of Experiment 6 hold when controlling for the gender of the sender. That is, do the effects of Experiment 6 replicate when the gender of the individual being judged is specified?

We replicated Experiments 1, 4, 6, and 7, among Japanese speaking participants to evaluate the reliability and generalizability of our findings. One of the authors translated the vignettes into Japanese; then, a professional English-proofing company back-translated the

Japanese version into English and checked the accuracy of translation against the original text. Based on their suggestion, the authors made minor revisions to the translation. We used the same design and materials, except that we replaced this U.S. centric headline “I’ve heard that the number of pedestrians killed in traffic in the United States is approaching a three-decade high.” by a Japanese centric headline “Last year, the suicide rate among teenagers in Japan was at an all-time high,” and the U.S. paranormal statement “The number “13” is unlucky” by an equivalent Japanese statement “The number “4” is unlucky.”

Preregistration, data, materials, Electronic Supplementary Materials (ESM), and the scripts used to analyze the data are available on the Open Science Framework at https://osf.io/ue76r/?view_only=926382bc987444299edd482c4100c220. In these studies, we report all measures, manipulations, and exclusions. Sample size was determined before any data analysis.

2. Experiment 1

The goal of Experiment 1 was to test whether people higher in communion would be more likely to agree with and share happier beliefs, in particular misbeliefs. Each participant was presented with 14 beliefs (out of a total of 42 stimuli), including a variety of misbeliefs (as well as some real news to match the fake news included) varying in anticipated happiness. For each belief, participants indicated how likely they would be to share it, the extent to which they agreed with it, and how happy it would make someone who believes in it. In line with H_1 , we predicted that participants higher in communion would be more likely to agree with and share happier beliefs, but that we would not observe this pattern for participants higher in agency. Following H_{1a-b} we predicted that neither communion nor belief’s happiness would have an independent effect on sharing and agreement with the beliefs.

We pre-registered sample size, exclusion criterion, hypotheses, and statistical analyses. Experiment 1 was replicated among Japanese participants.

2.1. Participants

We recruited 401 participants from the U.S., the U.K., and Ireland online using Prolific Academic (for simplicity, since what unifies these participants is being English-speaking, and that most came from the U.K., we refer to these samples throughout as the ‘English samples’). Participants were paid £0.63. We removed four participants who did not correctly answer the attention check, leaving 397 participants (282 women, $M_{Age} = 33.13$, $SD = 11.69$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.03$) (with an α -level of 5% and for a two-tailed test).

We recruited 402 Japanese participants online, using CrowdWorks. Participants were paid 90JPY (approximately £0.60). We removed 20 participants who did not correctly answer the attention check, leaving 382 participants (200 women, $M_{Age} = 39.77$, $SD = 9.50$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.03$) (with an α -level of 5% and for a two-tailed test).

2.2. Design and procedure

We selected 42 beliefs related to paranormal activity, religiosity, conspiracy theories, complementary and alternative medicines, real news, and fake news. The beliefs were selected so that half of them would be happy, and half sad. Participants were randomly assigned a set of 14 beliefs comprising two happy complementary and alternative medicine beliefs, two sad conspiracy theories beliefs, two happy paranormal beliefs, two sad paranormal beliefs, one happy religious belief, one sad religious belief, one happy true news, one sad true news, one happy fake news and one sad fake news (see Table 1). The beliefs within each set were presented in a randomized order.

For each belief, participant rated how willing they were to share the belief (1[Very unlikely] to 6 [Very likely]), how much they agreed or disagreed with the belief (1[Strongly disagree] to 7 [Strongly agree]), and how happy it would make someone who holds the belief (1[Feel unhappy] to 5 [Feel happy]). These questions were asked in a randomized order.

Next, participants were asked the extent to which 22 agentic and communal words generally describe them. The words were presented in a randomized order. Participants were asked “How well does each of the following words generally describe you?” on a seven-point Likert scale (1[Not at all] to 7 [Extremely well]). The communal items were “Faithful,” “Honest,” “Kind,” “Patient,” “Sensitive,” “Trusting,” “Understanding,” “Warm,” “Affectionate,” “Caring,” “Compassionate” ($\alpha_{\text{English sample}} = 0.84$; $\alpha_{\text{Japanese sample}} = 0.86$). The agentic items were “Adventuresome,” “Ambitious,” “Bossy,” “Clever,” “Competitive,” “Competent,” “Dominant,” “Leader,” “Outgoing,” “Rational,” “Wise” ($\alpha_{\text{English sample}} = 0.80$; $\alpha_{\text{Japanese sample}} = 0.88$). This method is commonly used to measure agency and communion (see, e.g., Abele et al., 2008; Fiske et al., 2002; Gebauer et al., 2013; Trapnell & Paulhus, 2012).

At the end of the experiment, participants completed an attention check (see section 1 of ESM) and provided demographics information.

2.3. Materials

We used six conspiracy theories selected from the Generic Conspiracist Beliefs Scale (Brotherton et al., 2013); six Complementary and Alternative Medicines selected from previous studies (e.g. Lindeman, 2011; Pennycook et al., 2015); eleven paranormal beliefs taken from the Paranormal Belief Scale (from the subscales “Psi”, “Witchcraft”, “Superstition”, “Spiritualism”, “Extraordinary Life Forms” and “Precognition”; see, Tobacyk, 2004) (one was adapted to create a happy belief); six religious beliefs taken from previous studies (e.g. Pennycook et al., 2015); six real news stories taken from mainstream media and

six fake news stories found on fact-checking websites such as Snopes. Examples and details about the properties of the materials can be found in Table 1. All materials are available in section 1 of ESM.

We pre-tested the materials in a pilot study to ensure the beliefs had the required properties (see section 2 of ESM and Table 1). In this pilot, we found preliminary support for H_1 , with communals being more likely to agree with and share happier beliefs, as well as a lack of main effect for either happiness or communion (a number of other hypotheses, distinct from the ones investigated here, were tested in this pilot, see section 2 of ESM for details).

Category	Expected Happiness	N	Example	Feeling attributed to the believer (Sad [1] to Happy [5])	
				Pilot	Exp. 1
Complementary & Alternative Medicine	Happy	6	Naturopathy such as herbal therapy or stone therapy can be an effective treatment.	4.10 (0.76)	4.25 (0.77)
Conspiracy Theories	Sad	6	Technology with mind-control capacities is used on people without their knowledge.	1.92 (0.96)	1.72 (0.95)
Paranormal Beliefs	Happy	6	Good things happen to certain people because they attract positive energy.	3.83 (0.94)	4.08 (0.89)
	Sad	6	Bad things happen to certain people because they attract negative energy.	2.57 (1.09)	2.78 (1.19)
Religious Beliefs	Happy	3	There is a heaven.	4.43 (0.93)	4.65 (0.70)
	Sad	3	There is a hell.	1.93 (0.95)	2.03 (1.04)
True News	Happy	3	A new study suggests that women access to education has never been higher in history	4.04 (0.99)	4.18 (1.01)
	Sad	3	Economic data suggests that a global recession is likely to occur in the years to come.	1.69 (0.75)	1.49 (0.74)
Fake News	Happy	3	A cat saved a woman's life by scaring off a bear trying to attack her.	3.80 (0.99)	4.20 (0.89)
	Sad	3	Cellphones are causing horns to grow from young people's skulls.	1.68 (0.89)	1.62 (0.97)

Table 1. The six categories of beliefs used in Experiment 1, with their expected happiness, the number of beliefs in each category, an example, and the observed average happiness score (and *SD*) in the pilot study and in Experiment 1.

2.4. Results and discussion

As planned, we conducted a linear mixed effect model with participants as random factor (see Figure 1). The predicted interactions between the beliefs' happiness and the participants' communion score are represented in Figure 2. We mean-centered the variables to facilitate the interpretation of the main effects.

Agreement
<i>Predictors</i>	<i>b</i>	<i>p</i>	<i>Fit with predictions</i>	<i>b</i>	<i>p</i>	<i>Fit with predictions</i>
Communion	0.33	<0.001	X	0.12	<0.001	X
Agency	0.04	0.38	✓	-0.02	0.57	✓
Happy	0.18	<0.001	X	0.23	<0.001	X
Communion * Happy	0.08	<0.001	✓	0.08	<0.001	✓
Agency * Happy	0.01	0.79	✓	0.05	0.017	X

Sharing
<i>Predictors</i>	<i>b</i>	<i>p</i>	<i>Fit with predictions</i>	<i>b</i>	<i>p</i>	<i>Fit with predictions</i>
Communion	0.31	<0.001	X	0.09	0.040	X
Agency	0.09	0.082	✓	0.04	0.31	✓
Happy	0.13	<0.001	X	0.19	<0.001	X
Communion * Happy	0.08	<0.001	✓	0.05	<0.001	✓
Agency * Happy	-0.01	0.64	✓	0.03	0.050	✓

Figure 1. Predictors of participants' agreement with the beliefs and willingness to share them among English speaking participants (left) and Japanese speaking participants (right). Bold betas represent p-values below the 0.05 alpha threshold.

Figure 2. Interaction between beliefs' happiness and participants' communion score on agreement with the beliefs and willingness to share them. The pink full line corresponds to participants one standard deviation higher in communion, and the blue dotted line to participants one standard deviation lower in communion. Shaded areas represent the 95% confidence intervals. Results from English speaking participants (left) were replicated among Japanese speaking participants (right).

Experiment 1 offers support for H₁: Japanese and English participants higher in communion were more likely to share and believe happier beliefs, but not participants higher in agency (with one exception: Japanese participants higher in agency were more likely to

believe happier beliefs). We find mixed evidence regarding H_{1a} , with no main effect of agency but with participants higher in communion being more likely to agree with and share (mis)beliefs.

Contrarily to H_{1b} , participants were more likely to agree with and share happier beliefs, even after taking into account the interaction with communion.

3. Experiment 2

Experiment 2 tests H_1 with different materials: pseudo-profound bullshit. Previous studies found that pseudo-profound bullshit receptivity was mediated by personality traits, notably lower analytical thinking (Bainbridge et al., 2019; Čavojová et al., 2019; Pennycook et al., 2015). However, to the best of our knowledge, the relationship between communion and pseudo-profound bullshit receptivity has not been studied. Moreover, the content of the bullshit has only been manipulated in one study (Čavojová et al., 2020), but not along the happiness dimension. Thus, past results do not tell us whether the happiness of the bullshit, or the degree of communion of the participants, influences receptivity to pseudo-profound bullshit—in particular since the pseudo-profound bullshit used in previous studies is overwhelmingly happy (e.g. “Today, science tells us that the essence of nature is joy” used by Pennycook et al. 2015 and Čavojová et al. 2020). In line with H_1 , communals could find these statements profound and be more likely to share them because of their positivity. To investigate the potential effect of bullshit happiness on its receptivity we created sad versions of existing happy pseudo-profound bullshit (e.g. “Today, science tells us that the essence of nature is misery”). We predicted that contrary to agenticity, communals would find happy pseudo-profound bullshit more profound than sad pseudo-profound bullshit.

3.1. Participants

We recruited 199 participants from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. We removed one participant who did not correctly answer the attention check, leaving 198 participants (145 women, $M_{Age} = 37.02$, $SD = 13.21$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.07$) (with an α -level of 5% and for a two-tailed test).

3.2. Design and procedure

In a between-participants design, we presented participants with one of three sets of pseudo-profound bullshit statements that were either happy or sad. Participants were asked to rate the profoundness of the statements (1[Not at all profound] to 5 [Very profound]) and how happy it would make someone who found them profound (1[Feel unhappy] to 5 [Feel happy]).

At the end of the experiment participants were asked the extent to which 22 agentic and communal words generally describe them. The same procedure as in Experiment 1 was used. The communion scale ($\alpha = 0.87$) and the agency scale ($\alpha = 0.75$) had good internal consistency.

3.3. Materials

We used one bullshit statement used by Pennycook et al. 2015 and Cavojova et al. 2020, “Today, science tells us that the essence of nature is joy”, and created a sad version of it “Today, science tells us that the essence of nature is misery”. We also selected two novel bullshit statements from the “The New Age Bullshit Generator” (<http://sebpearce.com/bullshit/>; used by Pennycook et al. 2015 to generate pseudo-profound bullshit) whose happiness could be reversed by changing only one word, and created sad versions of them, leading to these three pairs (with the sad version in brackets) of stimuli:

- Today, science tells us that the essence of nature is joy [misery].
- The goal of electromagnetic forces is to plant the seeds of knowledge [pain].
- Learning is the nature of empathy [hatred], and of us.

3.4. Results and discussion

As in Experiment 1, we conducted linear mixed effect models with participants as random factor.

First, happy pseudo-profound bullshit was judged significantly happier ($M = 3.65$, $SD = 0.77$) than sad bullshit ($M = 2.07$, $SD = 0.92$; $\beta = 1.37$ [1.22, 1.51], $t(195.99) = 18.20$, $p < .001$).

Second, we did not find the expected interaction between participants' communion score and the bullshit's happiness ($\beta = -0.02$ [-0.12, 0.07], $p = .60$). As expected, neither did we observe an interaction with participants' agentic score ($\beta = 0.07$ [-0.02, 0.16], $p = .11$).

Third, in a model without the interactions, happier bullshit was judged more profound than sad bullshit ($\beta = 0.11$ [0.02, 0.20], $p = .01$) and participants higher in communion were more likely to find all bullshit profound ($\beta = 0.14$ [0.04, 0.24], $p = .008$), contrary to participants higher in agency ($\beta = 0.03$ [-0.07, 0.14], $p = .51$).

Experiment 2 can be taken as evidence that pseudo-profound bullshit receptivity is both content sensitive (happier bullshit is judged more profound) and personality sensitive (participants higher in communion find bullshit more profound). However, Experiment 2 doesn't offer support for H₁ since we found no significant interaction between participants' personality and the bullshit's content.

Across Experiments 1 and 2 we found a consistent effect of beliefs' happiness, such that happy statements were more likely to be believed and shared (Experiment 1), or deemed profound (for pseudo-profound bullshit, Experiment 2).

4. Experiment 3

Experiment 1 suggests that communals are more likely to agree with and share happier beliefs. However, they might do so for a number of reasons, in particular to attempt to make others happier, or to display their high degree of communion. In Experiment 3 and 4 we investigate this latter use of happy beliefs to display one's niceness. We tested whether, regardless of their personality, participants' propensity to share happy or sad misbeliefs is modulated by the type of impression they want to convey. We hypothesized that participants would be more likely to share happy beliefs compared to sad beliefs when wanting to appear nice and kind than when wanting to appear competent and dominant (H_2).

4.1. Participants

We recruited 197 participants from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. We removed one participant who did not correctly answer the attention check, leaving 196 participants (128 women, $M_{Age} = 34.22$, $SD = 11.80$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.07$) (with an α -level of 5% and for a two-tailed test).

4.2. Design and procedure

At the beginning of the experiment, half of the participants were told "Imagine you're in a situation in which you want to appear nice and kind, which statement would you rather say in each of the pairs below?", the other half were told "Imagine you're in a situation in which you want to appear dominant and competent, which statement would you rather say in

each of the pairs below?” Participants were presented with seven pairs of beliefs and had to pick one belief per pair. The pairs were composed of a happy and a sad belief of the same category (e.g. they had to choose between one happy religious belief and one sad religious belief).

4.3. Materials

We selected beliefs from those used in Experiment 1. Five pairs of beliefs were matched in term of plausibility (happy beliefs: $M = 3.98$, $SD = 1.25$; sad beliefs: $M = 3.99$, $SD = 1.27$), and category (pieces of news, religious beliefs, and ontological confusions). In addition to these five pairs, we added two pairs not matched by category composed of conspiracy theories (found to be sad in the Pilot and Experiment 1) *versus* complementary and alternative medicine (found to be happy in the Pilot and Experiment 1), matched in term of plausibility (Complementary and Alternative Medicine: $M = 3.88$, $SD = 1.69$; Conspiracy Theories: $M = 3.71$, $SD = 1.74$). These two pairs could not be matched within category because there are essentially no sufficiently widespread happy conspiracy theories or sad complementary and alternative medicine beliefs. Presentation order was randomized. The seven pairs of beliefs used in the experiment are presented in Table 2.

Happy	Sad
I've read a study showing that women access to education has never been higher in history.	I've read that economic data suggests that a global recession is likely to occur in the years to come.
I've heard that a positive outlook is good for your heart. People who are optimists tend to have better heart health and live longer.	I've heard that the number of pedestrians killed in traffic in the United States is approaching a three-decade high.

God is always good.	God can be ruthless.
I believe there is a heaven.	I believe there is a hell.
Positive thoughts can cleanse the body of toxins.	Bad things happen to certain people because they attract negative energy.
Naturopathy such as herbal therapy or stone therapy can be an effective treatment.	The government uses people as patsies to hide its involvement in criminal activity.
Homeopathy can be an effective treatment.	The power held by heads of state is second to that of small unknown groups who really control world politics.

Table 2. Pairs of beliefs used in Experiment 3.

4.4. Results and discussion

We conducted a mixed effects logistic regression with participants as random factor, together with one-sample goodness-of-fit tests. The results are represented in Figure 3.

Participants selected more often happy beliefs when wanting to appear nice and kind (89.3%, 607/679, $\chi^2(1, N = 679) = 421.54, p = .006, \phi = 0.79$) than when wanting to appear dominant and competent (47.6%, 330/693, $\chi^2(1, N = 693) = 1.57, p = .21$; interaction term: $\beta = 2.78 [2.28, 3.29], Z = 10.87, p < .001$).

Figure 3. Bar plots representing the number of times participants selected happy and sad beliefs sorted by the impression they had to convey (dominant and competent or nice and kind).

In line with H₂, participants overwhelmingly selected happy beliefs to appear nice and kind, and showed no such preference when wanting to appear dominance and competent. However, Experiment 3 does not distinguish between different explanations for this pattern; in particular, whether participants, when motivated to appear nice and kind rather than dominant and competent, were particularly likely to select happy beliefs, or particularly unlikely to select sad beliefs.

5. Experiment 4

Experiment 4 is an extension of Experiment 3 with a within-participants design and a continuous measure of sharing instead of a forced binary choice between two beliefs:

participants had to report how willing they would be to share each statement individually. The goal of this experiment is to shed light on participants' motivation to share happy and sad beliefs when wanting to appear nice and kind, by contrast with competent and dominant. We replicated Experiment 4 among Japanese participants.

5.1. Participants

We recruited 202 participants from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. We removed one participant who did not correctly answer the attention check, leaving 201 participants (157 women, $M_{Age} = 35.14$, $SD = 12.32$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.07$) (with an α -level of 5% and for a two-tailed test).

We recruited 200 Japanese participants online, using CrowdWorks. Participants were paid 30JPY (approximately £0.20). We removed three participants who did not correctly answer the attention check, leaving 197 participants (108 women, $M_{Age} = 40.46$, $SD = 9.44$). With this sample size we had 95% power to detect a small effect ($f^2 = 0.07$) (with an α -level of 5% and for a two-tailed test).

5.2. Design, procedure, and materials

Participants were randomly presented with five statements (happy and sad) selected from the five pairs of Experiment 3 and matched in terms of plausibility and category. Participants were asked for each statement “Imagine you’re in a situation in which you want to appear nice and kind, how likely would you be to say the following sentence?” or “Imagine you’re in a situation in which you want to appear dominant and competent, how likely would you be to say the following sentence?” Participants answered on a 6-point Likert scale ([1] Very unlikely, [2] Unlikely, [3] Somewhat unlikely, [4] Somewhat likely, [5] Likely, [6] Very likely).

5.3. Results and discussion

We conducted linear mixed effects models with participants as random factor. Figure 4 offers a visualization of the results.

English sample

Participants were more willing to share happy beliefs compared to sad beliefs when motivated to appear nice and kind ($\beta = 0.80$ [0.64, 0.95], $p < .001$) than when motivated to appear dominant and competent ($\beta = 0.07$ [-0.10, 0.24], $p = .40$; interaction term: $\beta = 0.65$ [0.43, 0.87], $p < .001$). Importantly, participants were more likely to share happy beliefs when wanting to appear nice and kind ($M = 3.22$, $SD = 1.64$) than when wanting to appear competent and dominant ($M = 2.97$, $SD = 1.65$; $\beta = 0.18$ [0.02, 0.35], $p = .027$). Participants were also less willing to share sad beliefs when wanting to appear nice and kind ($M = 2.03$, $SD = 1.23$) than when wanting to appear dominant and competent ($M = 2.87$, $SD = 1.62$; $\beta = 0.54$ [0.38, 0.70], $p < .001$).

Japanese sample

Participants were more willing to share happy beliefs compared to sad beliefs when motivated to appear nice and kind ($\beta = 0.45$ [0.29, 0.62], $p < .001$) than when motivated to appear dominant and competent ($\beta = 0.13$ [-0.03, 0.30], $p = .11$; interaction term: $\beta = 0.62$ [0.39, 0.84], $p < .001$). Participants were not significantly more likely to share happy beliefs when wanting to appear nice and kind ($M = 3.46$, $SD = 1.34$) than when wanting to appear competent and dominant ($M = 3.40$, $SD = 1.24$; $\beta = 0.10$ [-0.07, 0.26], $p = .24$). Participants were less willing to share sad beliefs when wanting to appear nice and kind ($M = 2.87$, $SD = 1.33$) than when wanting to appear dominant and competent ($M = 3.55$, $SD = 1.32$; $\beta = -0.52$ [-0.36, 0.68], $p < .001$).

Figure 4. Interaction between the impression participants had to convey (dominant and competent, or nice and kind) and the beliefs' happiness (happy or sad) on participants' willingness to share the beliefs. Results from English speaking participants (left) were replicated among Japanese speaking participants (right).

5.4. Discussion

First, we replicate the findings of Experiment 3, strengthening H_2 further, with Japanese and English participants showing a preference for sharing happy beliefs compared to sad beliefs when wanting to appear nice and kind, a difference not observed when wanting to appear dominant and competent.

Second, the preference for happy beliefs observed in Experiments 3 and 4 appears primarily attributable to participants avoiding sharing sad beliefs when wanting to appear nice and kind. Such avoidance of sharing sad beliefs might thus counteract the negativity bias under some conditions (i.e. when people want to appear nice and kind, which is a common goal).

6. Experiment 5

Experiments 3 and 4 revealed that participants knew to share happy rather than sad beliefs when wishing to appear nice and kind, something they did not do when wishing to appear dominant and competent. In Experiments 5, 6 and 7, we test whether this strategy is effective: do people draw the desired inferences about a speaker's personality from the happiness of the beliefs shared. We hypothesized that people sharing happy beliefs would appear higher in communion than people sharing sad beliefs, and than a generic individual (H_3). Conversely, people sharing sad beliefs should appear less communal than a generic individual.

6.1. Participants

We recruited 297 participants from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. We removed three participants who did not correctly answer the attention check, leaving 294 participants (196 women, $M_{Age} = 35.48$, $SD = 11.55$). With this sample size we had 95% power to detect a medium effect ($d = 0.51$) (with an α -level of 5% and for a two-tailed test).

6.2. Design and procedure

Participants were presented with three beliefs that were consistently either happy or sad, and were told that the beliefs had been “randomly selected from what someone has said in the past few months.” Then, participants were asked “In your opinion, how well does each of the following words describe the individual who shared these statements? There is no right or wrong answer, follow your intuitions.” We selected four words from the communion-agency scale used in Experiment 1 “ambitious,” “leader,” “nice,” “kind.” We compared these two conditions (happy and sad beliefs) to the communion-agency score of a generic

individual, obtained by asking another set of participants the following question: “In your opinion, how well does each of the following words describe people in general?” with the same communion-agency scale.

6.3. Materials

The happy and sad beliefs were selected from Experiment 1. Beliefs were matched in terms of plausibility (happy beliefs: $M = 3.74$, $SD = 1.28$; sad beliefs: $M = 3.74$, $SD = 1.02$), distance from the neutral value “Feel neither happy nor unhappy” (happy beliefs: $M = 1.29$, $SD = 0.37$; sad beliefs: $M = -1.02$, $SD = 0.28$), and category (two pieces of news, two religious beliefs, and two ontological confusions). The (real) pieces of news were added so that the individuals did not only share misbeliefs.

The happy beliefs were:

- I’ve read that a positive outlook is good for your heart. People who are optimists tend to have better heart health and live longer.
- I believe there is a heaven.
- I think that positive thoughts can cleanse the body of toxins.

The sad beliefs were:

- I’ve read that the number of pedestrians killed in traffic in the United States is approaching a three-decade high.
- I believe there is a hell.
- I think that bad things happen to certain people because they attract negative energy.

6.4. Results and discussion

In the analyses below we conducted Welch t-tests and linear mixed effect models with participants as random factor. The results on Communion are depicted in Figure 5 (see ESM for a visual representation of the results on Agency).

Compared to a generic individual's communion score ($M = 4.16$, $SD = 1.23$), sharing happy beliefs increased perceived communion ($M = 5.42$, $SD = 1.09$; $t(192.57) = 7.60$, $p < .001$, $d = 1.08$), while sharing sad beliefs decreased perceived communion ($M = 2.62$, $SD = 1.21$; $t(194) = 8.84$, $p < .001$, $d = 1.26$).

Compared to a generic individual's agency score ($M = 4.00$, $SD = 1.19$), sharing happy beliefs did not significantly increase perceived agency ($M = 3.96$, $SD = 1.33$; $t(192.32) = 0.23$, $p = .82$, $d = 0.03$), while sharing sad beliefs decreased perceived agency ($M = 3.23$, $SD = 1.51$; $t(182.5) = 3.98$, $p < .001$, $d = 0.68$).

The effect of sharing happy beliefs was stronger on communion than on agency (compared to a generic individual: $\beta = 0.97$ [0.69, 1.25], $p < .001$; compared to sharing sad beliefs: $\beta = 1.26$ [1.01, 1.51], $p < .001$). These results support H₃: sharing happy beliefs is an effective strategy to appear nice compared to sharing sad beliefs or not sharing anything.

7. Experiment 6

Experiment 5 showed that one can benefit from sharing happy beliefs—by being perceived as higher in communion—and suffer from sharing sad beliefs—by being perceived as lower in communion (and also in competence). That experiment revealed no costs to sharing happy beliefs since doing so did not lower perceived agency. Experiment 6 serves two goals: replicating the findings of Experiment 5 with novel words from the agency-communion scale, and looking for the potential costs of sharing happy beliefs, as well as benefits of sharing sad beliefs. To do so, we split the agency dimension in two: competence (“Clever,”

“Rational”), and dominance (“Bossy,” “Dominant”; see, Abele & Wojciszke, 2007; Oliveira et al., 2019). We hypothesized that people sharing happy beliefs would appear lower in dominance compared to people sharing sad beliefs, and to a generic individual. Peripherally, we also hypothesized that sharing sad beliefs would lead to higher perceived dominance compared to people sharing happy beliefs, and to a generic individual. Experiment 6 was replicated among Japanese participants.

7.1. Participants

We recruited 300 participants from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. We removed one participant who did not correctly answer the attention check, leaving 299 participants (195 women, $M_{Age} = 34.38$, $SD = 12.39$). With this sample size we had 95% power to detect a medium effect ($d = 0.51$) (with an α -level of 5% and for a two-tailed test).

We recruited 450 Japanese participants online, using CrowdWorks. Participants were paid 30JPY (approximately £0.20). We removed four participants who did not correctly answer the attention check, leaving 446 participants (258 women, $M_{Age} = 39.61$, $SD = 9.59$). With this sample size we had 95% power to detect a small effect ($d = 0.42$) (with an α -level of 5% and for a two-tailed test).

7.2. Design, procedure, and materials

The design, procedure and materials are similar to Experiment 5 with the exception that we did not use the same words to measure communion and agency. Communion was measured with “Caring” and “Kind.” Agency was divided into competence, measured with “Clever” and “Rational,” and dominance, measured with “Bossy” and “Dominant.” These words had the highest loadings in each axis when conducting a Principal Component Analysis

(PCA) on the agency-communion scale used in Experiment 1 (for more details on the PCA see section 3 of the ESM).

7.3. Results

In the analyses below we conducted Welch's t-tests and linear mixed effect models with participants as random factor. The results on Communion are depicted in Figure 5 (see ESM for a visual representation of the results on Competence and Dominance).

Figure 5. Density plots representing the communion scores attributed by participants to a speaker sharing sad beliefs (blue distribution), happy beliefs (green distribution), or a baseline (i.e. generic) individual (salmon distribution) in Experiments 5 and 6.

English sample

The individual sharing happy beliefs was deemed higher in communion ($M = 5.38$, $SD = 1.02$) than the individual sharing sad beliefs ($M = 2.89$, $SD = 1.08$; $t(195.21) = 16.69$, $p < .001$, $d = 2.37$). Compared to a generic individual's score of communion ($M = 4.62$, $SD = 1.06$), sharing happy beliefs increased perceived communion ($t(197.88) = 5.14$, $p < .001$, $d = 0.73$), while sharing sad beliefs decreased perceived communion ($t(197.69) = 11.44$, $p < .001$, $d = 1.62$).

The individual sharing happy beliefs was deemed higher in competence ($M = 4.13$, $SD = 1.13$) than the individual sharing sad beliefs ($M = 3.10$, $SD = 1.21$; $t(195.15) = 6.21$, $p < .001$, $d = 0.88$). Compared to a generic individual's score of competence ($M = 4.07$, $SD = 1.16$), sharing happy beliefs did not significantly increase perceived competence ($t(198) = 0.32$, $p = .75$, $d = 0.05$), while sharing sad beliefs decreased perceived competence ($t(197.25) = 5.86$, $p < .001$, $d = 0.88$).

The individual sharing happy beliefs was deemed lower in dominance ($M = 2.82$, $SD = 1.15$) than the individual sharing sad beliefs ($M = 4.30$, $SD = 1.16$; $t(195.99) = 9.03$, $p < .001$, $d = 1.28$). Compared to a generic individual's score of dominance ($M = 4.09$, $SD = 1.05$), sharing happy beliefs decreased perceived dominance ($t(195.49) = 8.15$, $p < .001$, $d = 1.15$), while sharing sad beliefs did not significantly increase perceived dominance ($t(197.25) = 1.37$, $p = .17$, $d = 0.15$).

The effect of sharing happy beliefs was stronger on communion than on competence (compared to a generic individual: $\beta = 0.58$ [0.34, 0.82], $p < .001$; compared to sharing sad beliefs: $\beta = 0.98$ [0.77, 1.20], $p < .001$).

Japanese sample

The individual sharing happy beliefs was deemed higher in communion ($M = 4.19$, $SD = 1.23$) than the individual sharing sad beliefs ($M = 2.72$, $SD = 0.99$; $t(285.13) = 11.41$, $p < .001$, $d = 1.32$). Compared to a generic individual's score of communion ($M = 4.55$, $SD = 1.20$), sharing happy beliefs decreased perceived communion ($t(294) = 2.53$, $p = .012$, $d = 0.29$), sharing sad beliefs also decreased perceived communion ($t(280.94) = 14.28$, $p < .001$, $d = 1.66$).

The individual sharing happy beliefs was deemed higher in competence ($M = 3.77$, $SD = 1.13$) than the individual sharing sad beliefs ($M = 3.37$, $SD = 1.21$; $t(294.93) = 3.17$, $p = .002$, $d = 0.37$). Compared to a generic individual's score of competence ($M = 3.97$, $SD = 1.05$), sharing happy beliefs did not significantly decreased perceived competence ($t(293.27) = 1.62$, $p = .107$), while sharing sad beliefs significantly decreased perceived competence ($t(293.20) = 4.99$, $p < .001$, $d = 0.58$).

The individual sharing happy beliefs was deemed lower in dominance ($M = 3.41$, $SD = 1.15$) than the individual sharing sad beliefs ($M = 4.34$, $SD = 1.16$; $t(288.72) = 5.88$, $p = .002$, $d = 0.68$). Compared to a generic score of dominance ($M = 3.28$, $SD = 1.14$), sharing happy beliefs had no significant effect on perceived dominance ($t(278.63) = 0.84$, $p = .40$, $d = 0.09$), while sharing sad beliefs significantly increase perceived dominance ($t(292.99) = 7.65$, $p < .001$, $d = 0.88$).

The effect of sharing happy beliefs was stronger on communion than on competence compared to sharing sad beliefs ($\beta = 0.88$ [0.65, 1.11], $p < .001$), but not compared to a generic individual ($\beta = 0.13$ [-0.11, 0.37], $p = .29$).

7.4 Discussion

Among English participants we find that sharing happy beliefs is an effective strategy to appear nice (further supporting H₃). These results also highlight a cost of sharing happy beliefs—appearing less dominant (H₄)—and point to a potential benefit of sharing sad beliefs—appearing more dominant.

Among Japanese participants, the picture is more complicated. We don't find support for the hypothesis that sharing happy beliefs is an effective strategy to appear nice, compared to sharing nothing at all (H₃). And we only find partial support for H₄, since the sharing of sad

beliefs is associated with costs and benefits (appearing more dominant but lower in communion) but the sharing of happy beliefs did not lead to lower scores of dominance. The sharing of happy beliefs simply had no measurable effect on sharers' personality score compared to a generic individual. It might be that, in Japan, people are more expected to share happy beliefs by default.

Still, among both English and Japanese participants, people sharing happy beliefs are deemed higher in communion than people sharing sad beliefs.

8. Experiment 7

Experiment 7 investigated whether the results of Experiment 6 hold when controlling for the gender of the sender. It could be that the sharing of happy or sad beliefs is associated with one gender more than another, which would bias the comparisons with the generic individual, for example if this generic individual is assumed by participants to be of a given gender. Experiment 7 was replicated among Japanese participants. This experiment is largely exploratory, and we did not make any specific predictions regarding interactions between the gender of the individual and our other variables.

8.1. Participants

We recruited 601 participants (430 women, $M_{Age} = 35.30$, $SD = 12.30$) from the U.S., the U.K., and Ireland online, using Prolific Academic. Participants were paid £0.2. With this sample size we had 95% power to detect a medium effect ($d = 0.51$) (with an α -level of 5% and for a two-tailed test).

We recruited 606 Japanese participants online, using CrowdWorks. Participants were paid 30JPY (approximately £0.20). We removed twenty participants who did not correctly answer the attention check, leaving 586 participants (258 women, $M_{Age} = 39.61$, $SD = 9.59$).

With this sample size we had 95% power to detect a medium effect ($d = 0.52$) (with an α -level of 5% and for a two-tailed test).

8.2. Design, procedure, and materials

The design, procedure, and materials are identical to Experiment 6, with the exception that we provided the gender of the individual sharing the statements. We thus had six conditions instead of three: A woman sharing happy beliefs; A woman sharing sad beliefs; A generic woman; A man sharing happy beliefs; A man sharing sad beliefs; A generic man.

8.3. Results

Figures 6. Density plots representing the communion scores (top line), competence score (middle line), and dominance score (bottom line) attributed to a speaker sharing sad beliefs (blue distribution), happy beliefs (green distribution), or a generic individual (salmon distribution) among English participants (on the left) and Japanese participants (on the right), when the speaker described in the vignette was a woman (♀) or a man (♂).

English sample

When the individual in the vignette was a woman

The woman sharing happy beliefs was deemed higher in communion ($M = 5.41$, $SD = 0.92$) than the woman sharing sad beliefs ($M = 3.17$, $SD = 1.05$; $t(195.33) = 16.02$, $p < .001$, $d = 2.26$). Compared to a generic woman's score of communion ($M = 5.47$, $SD = 1.10$) sharing happy beliefs did not significantly increase perceived communion ($t(192.55) = 0.45$, $p = .66$, $d = 0.06$) while sharing sad beliefs decreased perceived communion ($t(197.56) = 15.12$, $p < .001$, $d = 2.14$).

The woman sharing happy beliefs was deemed higher in competence ($M = 3.91$, $SD = 1.15$) than the woman sharing sad beliefs ($M = 3.10$, $SD = 1.06$; $t(197.90) = 5.21$, $p < .001$, $d = 0.73$). Compared to a generic woman's score of competence ($M = 5.20$, $SD = 1.10$), sharing happy beliefs significantly decreased perceived competence ($t(198.75) = 8.13$, $p < .001$, $d = 1.15$), as did sharing sad beliefs ($t(197.70) = 13.78$, $p < .001$, $d = 1.95$).

The woman sharing happy beliefs was deemed lower in dominance ($M = 3.16$, $SD = 1.27$) than the woman sharing sad beliefs ($M = 4.46$, $SD = 1.08$; $t(194.75) = 7.77$, $p < .001$, $d = 1.09$). Compared to a generic woman's score of dominance ($M = 3.94$, $SD = 1.06$), sharing happy beliefs decreased perceived dominance ($t(193.36) = 4.72$, $p < .001$, $d = 0.66$), while sharing sad beliefs increased perceived dominance ($t(197.89) = 3.40$, $p < .001$, $d = 0.48$).

When the individual in the vignette was a man

The man sharing happy beliefs was deemed higher in communion ($M = 5.35$, $SD = 1.05$) than the man sharing sad beliefs ($M = 2.97$, $SD = 1.08$; $t(198.71) = 15.80$, $p < .001$, $d = 2.23$). Compared to a generic man's score of communion ($M = 4.50$, $SD = 1.00$) sharing happy beliefs significantly increased perceived communion ($t(199.49) = 5.82$, $p < .001$, $d = 0.82$), while sharing sad beliefs decreased perceived communion ($t(197.46) = 10.47$, $p < .001$, $d = 1.48$).

The man sharing happy beliefs was deemed higher in competence ($M = 4.15$, $SD = 1.32$) than the man sharing sad beliefs ($M = 3.24$, $SD = 1.25$; $t(198.68) = 5.01$, $p < .001$, $d = 0.71$). Compared to a generic man's score of competence ($M = 4.47$, $SD = 0.86$), sharing happy beliefs significantly decreased perceived competence ($t(172.52) = 2.05$, $p = .041$, $d = 0.29$), as did sharing sad beliefs ($t(175.52) = 8.10$, $p < .001$, $d = 1.15$).

The man sharing happy beliefs was deemed lower in dominance ($M = 2.82$, $SD = 1.13$) than the man sharing sad beliefs ($M = 4.31$, $SD = 1.28$; $t(198.68) = 5.01$, $p < .001$, $d = 0.71$). Compared to a generic man's score of dominance ($M = 4.62$, $SD = 0.90$), sharing happy beliefs decreased perceived dominance ($t(190.21) = 12.54$, $p < .001$, $d = 1.77$), as did sharing sad beliefs ($t(177.50) = 2.01$, $p = .046$, $d = 0.28$).

8.3.2 Japanese sample

When the individual in the vignette was a woman

The woman sharing happy beliefs was deemed higher in communion ($M = 4.18$, $SD = 1.17$) than the woman sharing sad beliefs ($M = 2.66$, $SD = 1.22$; $t(191.31) = 8.91$, $p < .001$, $d = 1.28$). Compared to a generic woman's score of communion ($M = 4.97$, $SD = 0.87$) sharing happy beliefs decreased perceived communion ($t(179.61) = 5.31$, $p < .001$, $d = 0.76$), as did sharing sad beliefs ($t(172.37) = 15.15$, $p < .001$, $d = 2.18$).

The woman sharing happy beliefs was deemed higher in competence ($M = 3.64$, $SD = 1.22$) than the woman sharing sad beliefs ($M = 3.15$, $SD = 1.22$; $t(191.95) = 2.80$, $p = .006$, $d = 0.40$). Compared to a generic woman's score of competence ($M = 4.07$, $SD = 1.06$), sharing happy beliefs significantly decreased perceived competence ($t(189.43) = 2.62$, $p = .009$, $d = 0.38$), as did sharing sad beliefs ($t(186.64) = 5.61$, $p < .001$, $d = 0.81$).

The woman sharing happy beliefs was deemed lower in dominance ($M = 3.44$, $SD = 1.44$) than the woman sharing sad beliefs ($M = 3.96$, $SD = 1.47$; $t(191.78) = 2.52$, $p = .012$, $d = 0.36$). Compared to a generic woman's score of dominance ($M = 3.00$, $SD = 1.08$), sharing happy beliefs increased perceived dominance ($t(179.99) = 2.41$, $p = .017$, $d = 0.34$), as did sharing sad beliefs ($t(175.18) = 5.22$, $p < .001$, $d = 0.75$).

When the individual in the vignette was a man

The man sharing happy beliefs was deemed higher in communion ($M = 4.18$, $SD = 1.22$) than the man sharing sad beliefs ($M = 2.65$, $SD = 0.91$; $t(184.63) = 9.99$, $p < .001$, $d = 1.41$). Compared to a generic man's score of communion ($M = 3.91$, $SD = 0.99$), sharing happy beliefs did not significantly increased perceived communion ($t(190.98) = 1.71$, $p = .089$, $d = 0.24$), while sharing sad beliefs decreased perceived communion ($t(197.46) = 9.17$, $p < .001$, $d = 1.32$).

The man sharing happy beliefs was deemed higher in competence ($M = 3.91$, $SD = 1.17$) than the man sharing sad beliefs ($M = 3.44$, $SD = 1.13$; $t(195.97) = 2.89$, $p = .004$, $d = 0.41$). Compared to a generic man's score of competence ($M = 4.09$, $SD = 0.96$), sharing happy beliefs did not significantly decreased perceived competence ($t(191.26) = 1.20$, $p = .23$, $d = 0.17$), while sharing sad beliefs decreased perceived competence ($t(186.59) = 4.35$, $p < .001$, $d = 0.62$).

The man sharing happy beliefs was deemed lower in dominance ($M = 3.23$, $SD = 1.42$) than the man sharing sad beliefs ($M = 4.43$, $SD = 1.22$; $t(193.90) = 6.35$, $p < .001$, $d = 0.90$). Compared to a generic man's score of dominance ($M = 4.60$, $SD = 0.92$), sharing happy beliefs decreased perceived dominance ($t(172.16) = 8.10$, $p < .001$, $d = 1.14$) while sharing sad beliefs did not significantly decreased perceived dominance ($t(177.88) = 1.12$, $p = .26$, $d = 0.16$).

8.4. Discussion

We found strong gender differences, as well as some cultural differences, in the evaluation of generic gendered individual. In several cases—in particular the communion scores of women—the ratings for generic individuals were very high, making it difficult to observe an increase due to the sharing of any type of belief. Additionally, the happy misbeliefs used (“there’s a heaven,” “I think that positive thoughts can cleanse the body of toxins”) were bound to be found contentious by some participants, likely leading them to lower the communion score of the individual sharing them, compared to an individual who doesn’t share anything.

By contrast, since the happy and the sad beliefs were both potentially contentious, their effects can be compared more directly. Among English and Japanese participants, individuals sharing happy beliefs, compared to individuals sharing sad beliefs, were perceived as significantly higher in communion (English: $d_{man} = 2.23$, $d_{woman} = 2.26$; Japanese: $d_{man} = 1.41$; $d_{woman} = 1.28$) and competence (English: $d_{man} = 0.71$, $d_{woman} = 0.73$; Japanese: $d_{man} = 0.41$; $d_{woman} = 0.40$), while being perceived as significantly lower in dominance (English: $d_{man} = 1.23$, $d_{woman} = 1.10$; Japanese: $d_{man} = 0.90$; $d_{woman} = 0.36$). The effect sizes suggest that the influence of happy vs. sad beliefs is strongest on attributed communion scores.

9. General discussion

How can happy misbeliefs compete against sad misbeliefs, whose cultural success is bolstered by the well-documented negativity bias? Are there circumstances under which a positivity bias prevails? We have argued that ‘happy thoughts’ can compete against sad misbeliefs because they make others happy and allow people who share them to appear nice. We formulated four main hypotheses: people high in communion (communals), by contrast with people high in agentivity (agentics), should be more likely to believe and share happy

beliefs (H_1); when wanting to appear nice, people should favor happy beliefs to sad beliefs (H_2); sharing happy beliefs might be an effective way to appear nice (H_3); and sharing happy beliefs instead of sad beliefs leads to lower perceived dominance (H_4). Seven experiments offered support for these hypotheses. Overall we found that: (i) communals, contrary to agentics, are more likely to believe and share a range of happy misbeliefs, (ii) to appear nice and kind people avoid sharing sad beliefs, preferring instead happy beliefs, something they do not do to appear dominant and competent, (iii) sharing happy beliefs instead of sad beliefs is an effective way to appear nice, and (iv) sharing happy beliefs instead of sad beliefs is not cost-free, since it leads to being perceived as being less dominant.

10. Conclusion

Across seven experiments conducted among 3855 English and Japanese participants, we found that people higher in communion (communals) are more likely to believe and share happy beliefs; that when wanting to appear nice and kind (but not competent and dominant), people avoid sharing sad misbeliefs, and instead prefer happy misbeliefs; that sharing happy beliefs instead of sad beliefs leads to being perceived as nicer and kinder; and that sharing happy beliefs instead of sad beliefs leads to lower perceived dominance.

Communals might be more likely to believe and share happy misbeliefs instead of sad misbeliefs because doing so makes others happy, but they might also do so to signal that they are nice and kind. This latter function is supported by the fact that our participants used happy misbeliefs strategically to serve impression management goals (i.e. to appear nice and kind), and that they did so successfully (participants who shared happier beliefs were believed to be nicer and kinder). Happy misbeliefs may be able to compete against sad misbeliefs and become culturally successful because they allow their senders to convey specific positive impressions—to appear nice and kind.

Previous results offer convergent evidence for our broad thesis that the success of positive beliefs is related to a desire to convey an impression of high communion. First, the overall bias in favor of happy thoughts observed in our experiments, as well as the prevalence of the positivity bias in (some) cultural transmission might be explained by the importance people put on communion compared to agency when it comes to impression formation and reputation management (Abele & Bruckmüller, 2011; Abele & Wojciszke, 2007, 2014; Suitner & Maass, 2008; Ybarra et al., 2012; see also: Stubbersfield et al., 2019). Previous research has also shown that women and people higher in agreeableness show a stronger positivity bias in naturalistic speech (Augustine et al., 2011). Given that agreeableness is strongly correlated with communion (Bai et al., 2020; Blackburn et al., 2004; DeYoung, 2006), and that women score higher in communion than men (Costa Jr et al., 2001), these findings dovetail nicely with our results. Finally, and more broadly, our thesis is in line with a growing body of research suggesting that holding beliefs can serve social functions (e.g. Kurzban, 2012; Petersen et al., 2020; Williams, 2019).

The present endeavor focused on only one aspect of the beliefs' content—their happiness—but other features, such as their frequency in the population, might also interact with communion to help explain their success. For instance, endorsing and sharing widely held beliefs might also be used to signal one's high communion (e.g. that one doesn't like to antagonize others). In our pilot, we found that communals, but not agentics, were more likely to share beliefs that were thought to be more widely believed in the population ($\beta = 0.05$ [0.03, 0.06], $p < .001$). This observation fits well with the finding that communals are more likely to be religious in religious countries (potentially to facilitate assimilation), whereas agentics tend to be more religious in non-religious countries (potentially to differentiate themselves), and vice-versa (Gebauer et al. 2013).

Our experiments focused on misbeliefs, notably because we wanted to shed light on an apparently irrational phenomena (i.e. why would people share and believe things that are not accurate?), but our hypotheses are not specific to misbeliefs, and should also hold with true beliefs. Future experiments could attempt to replicate our findings with true beliefs. Similarly, although our results were broadly similar in the sample of English-speaking countries and in Japan, replications in other cultures could further test their cross-cultural robustness.

The vignettes used in the present experiments allow for well-controlled experiments, but their ecological validity might be limited. Our results could be usefully complemented by observational data, for instance about whether people who are higher in communion do share more happy thoughts in everyday life.

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