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Third-person self-talk reduces Ebola worry and risk perception by enhancing rational thinking

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Abstract

Background: During the fall of 2014, the threat of an Ebola outbreak gripped the United States (Poll, October 8-12, 2014), creating a unique opportunity to advance basic knowledge concerning how emotion regulation works in consequential contexts and translate existing research in this area to inform public health and policy.

Method: We addressed these issues by examining whether 3rd person self-talk, a simple technique that promotes emotion regulation, could nudge people into reasoning about Ebola more rationally. 1257 people from across the United States were asked to write about their feelings about Ebola using their name or I (i.e., 3rd person self-talk vs. 1st person self-talk) as concerns about Ebola swelled (10/24/14-10/26/14).

Results: Third-person self-talk led participants who scored high on Ebola worry at baseline to generate more fact-based reasons not to worry about Ebola, which predicted reductions in their Ebola worry and risk perception. These findings held when controlling for several theoretically relevant covariates, highlighting their robustness.

Conclusion: These results demonstrate how a simple linguistic technique can enhance rational thinking and quell worry about a pressing public health threat.

Keywords: Emotion regulation, psychological distance, self-regulation, self-control, worry, anxiety

On September 30, 2014, the United States Centers for Disease Control and Prevention confirmed the first-ever case of Ebola in the United States. Shortly following this announcement, anxiety concerning the threat of an Ebola outbreak developed despite repeated assurances from

public health and policy officials that the actual risk of such an outbreak was low. According to one nationally representative poll conducted between 10/18/14 and 10/24/14, approximately 52% of adults living in the United States were concerned about the prospect of a large-scale Ebola outbreak (Poll, October 8-12, 2014).

This crisis created a unique opportunity to advance basic knowledge concerning how emotion regulation works in consequential contexts and translate existing research in this area to inform public health and policy. We capitalized on this opportunity by examining whether 3rd person self-talk, a simple linguistic technique that promotes emotion regulation (e.g., Dolcos & Albarracin, 2014; Kross et al., 2014; Moser et al., 2017; Nook, Schleider, & Somerville, 2017; Streamer, Seery, Kondrack, Lamarche, & Saltsman, 2017; Zell, Warriner, & Albarracin, 2012), could "nudge" people living in the United States into reasoning about Ebola more rationally as concerns about this issue swelled.

Self-talk as an emotion regulation mechanism

"Self-talk" is ubiquitous; we all have an internal monologue that guides our moment-to-moment reflections (Diaz & Berk, 1992; Kohlberg, Yaeger, & Hjertholm, 1968; Vygotsky, 1962). Recent work demonstrates that small shifts in the language people use to refer to the self as they engage in this process consequentially influences emotion regulation. Specifically, laboratory research indicates that using one's own name and other non-1st person pronouns to refer to the self during introspection (i.e., "Why is **Maya** feeling this way?"), rather than the 1st person pronoun "I" (i.e., "Why am **I** feeling this way?"), enhances people's ability to control their thoughts, feelings, and behavior under stress (e.g., Kross et al., 2014; Moser et al., 2017; Nook et al., 2017; Streamer et al., 2017) and facilitates wise, emotionally intelligent reasoning (Grossmann & Kross, 2014a).

How does 3rd person self-talk facilitate emotion-control? Common experience suggests that it is easier to reason objectively about other people's problems than about one's own. 3rd person self-talk operates via a similar mechanism. When people use their name to reflect on the self, they think about the self similar to how they think about others (Grossmann & Kross, 2014b; Kross et al., 2014; Moser et al., 2017), which provides them with the psychological distance needed to navigate stressful experiences more objectively (e.g., Beck, 1970; Bernstein et al., 2015; Fujita, Trope, Liberman, & Levin-Sagi, 2006; Kross & Ayduk, 2011; Mischel & Rodriguez, 1993; Trope & Liberman, 2010).

Importantly, recent findings suggest that 3rd person self-talk facilitates emotion regulation relatively effortlessly, without consuming cognitive control resources that become depleted under stress. For example, a recent Event Related Potential (ERP) study (Moser et al., 2017, Study 1), found that non-1st person self-talk led to reductions in a neurophysiological marker of emotional reactivity (i.e., the Late Positive Potential) while viewing negative emotional pictures without enhancing activations in a neurophysiological marker of cognitive control (i.e., the Stimulus Preceding Negativity). These findings were conceptually replicated using fMRI (Moser et al., 2017, Study 2), providing converging evidence for the idea that 3rd person self-talk constitutes a relatively effortless emotion regulation tool.

Research questions

In sum, extant research suggests that 3rd person self-talk constitutes a relatively easy-to-implement tool for facilitating emotion-regulation. However, the majority of the aforementioned work has been performed with relatively small samples of undergraduates in the laboratory using standardized techniques for eliciting emotion. Thus, whether (and how) this tool is effective for helping people cope with acute stressors in vivo is unknown.

We addressed this question by examining whether cueing a large sample of people living across the United States to engage in 3rd person (vs. 1st person) self-talk to reason about their deepest thoughts and feelings about Ebola as concerns about this disease peaked in the United States during the Fall of 2014 would nudge them into reasoning about Ebola more rationally, in ways that predicted declines in their worry and risk perception. Supplementary Figure 1 provides a timeline illustrating when the study was implemented relative to other events concerning Ebola.

The unique nature of these data also allowed us to address two important additional questions. First, does a linear dose-response relationship characterize the link between 3rd person self-talk and rational thinking? Although participants are typically able to easily implement 1st and 3rd person self-talk instructions, they often differ in the extent to which they use 1st or 3rd person parts of speech when reasoning about emotional issues. Thus, we examined whether variability in the degree to which people use these different parts of speech impacts the effectiveness of this intervention.

Second, do individual differences in baseline Ebola worry moderate the benefits of 3rd

person self-talk? Although some research indicates that distancing strategies work best for individuals who score high on individual difference measures of distress, other work has revealed main effects only of distancing strategies (Kross & Ayduk, 2009; Kross, Gard, Deldin, Clifton, & Ayduk, 2012; Park et al., 2014; Penner et al., 2015; Wisco & Nolen-Hoeksema, 2011). Given such conflicting findings, we examined whether participants who were more worried about Ebola at the start of the study benefited the most from implementing 3rd person self-talk.

Hypotheses

We hypothesized that participants in the 3rd person self-talk group would use more 3rd vs. 1st person language when they reasoned about Ebola compared to participants in the 1st person group, which would enhance their ability to identify fact-based reasons not to worry about Ebola.[1] In turn, we expected focusing on fact-based reasons not to worry about Ebola would reduce participants (a) Ebola worry, (b) probability estimates concerning how likely they were to contract Ebola, and (c) assessments of how long Ebola would remain a concern in the United States. As Figure 1 illustrates, we were uncertain about which, if any links in our theoretical model participants' baseline levels of worry surrounding Ebola would moderate. Therefore, we examined moderation at each path.

----Figure 1 Here----

Materials and Methods

Participants

1257 individuals from across the United States were recruited through Amazon's Mechanical Turk. This online platform allowed us to study a large number of participants from a range of backgrounds living across the United States during the height of the Ebola crisis.

We aimed to run 1000 participants to test our predictions robustly with a large and broad sample of participants from across the United States. Thus, the online platform that we used to recruit participants collected data until 1000 complete responses were obtained. We collected data from more than 1000 participants because several participants began but did not complete

[1] Including the degree to which participants used 3rd vs. 1st person language in their essays as an intervening variable between Condition and Fact-based Reasons Not to Worry allowed us to examine whether a linear (or non-linear) dose-response characterizes the relationship between these variables.

the study (as is often the case on the online platform we used to run the study). Supplementary Figure 2 provides a geographical breakdown of the sample.

To be eligible, participants had to declare themselves native English language speakers. Two hundred and forty (240) participants started but did not complete the task, 8 subjects did not write on topic, and 1 subject did not provide responses to multiple key variables, leaving 1008 subjects for analysis (n_{female} = 538, n_{male} = 466, $n_{other\ or\ missing}$ = 4, M_{age} = 36.03, SD_{age} = 12.90). All participants provided informed consent and all procedures were performed in compliance with the Internal Review Board at the first author's institution. Participants were compensated $0.50 for their participation.

Table 1 describes the sample demographics; Table 2 presents means, standard deviations and zero-order correlations for all key study variables. Attrition was related to condition, OR = 0.45, z = -4.77, p < .001; more 3rd person self-talk participants dropped out. However, as noted below, covariate analyses demonstrated that several theoretically relevant background variables did not influence the results.

----Table 1 Here----

----Table 2 Here----

Cover story

Participants were told the study focused on people's feelings and ways of thinking about current events.

Baseline Ebola Worry

Next, participants rated how worried they were about Ebola[2] using a slider scale (0 = *not at all worried*, 10 = *extremely worried*). We embedded this question among a series of filler items that asked participants to rate how worried they were about several other current issues (e.g., terrorism, mass shootings, climate change, skin cancer). The 3rd person group (M = 3.71, SD = 3.20) scored marginally lower on this measure than the 1st person group (M = 4.09, SD = 3.39), $t(1006) = 1.83$, $p = .067$.

We also examined whether baseline worry about health and current events in general influenced our results by collapsing scores on each of the five questions we administered at baseline ($\alpha = .72$) to form a single index of baseline worry (M = 4.57, SD = 2.14). The groups did not vary on this variable, $t(1006) = 1.33$, $p = .184$. Replacing the baseline Ebola worry measure with this composite index of baseline worry did not substantively alter any of the results we report.

Manipulation

Next, participants were told that we were interested in exploring their thoughts about Ebola. They were told that, “recently, Ebola has become a widespread concern. In this study we are interested in learning about different ways that people think about this issue”. They were then randomly assigned to write about their thoughts and feelings about Ebola using either 1st person language or 3rd person language following procedures adapted from those used by Kross and colleagues (2014). Participants in the 1st person self-talk group received the following instructions:

> Some people report thinking about current events in the **first-person.** For example, they use the first-person pronouns **“I” and “my”** as they reflect on their thoughts and feelings surrounding current events and ask themselves, "Why am **“I"** feeling this way?"

[2] Although we did not ask participants’ to directly rate how proximal the threat of Ebola seemed, worry is generally thought to capture the degree to which one feels threatened by an experience that is perceived to be imminent or psychological proximal (e.g., Berenbaum, Thompson, & Bredemeier, 2007; Chandran & Menon, 2004; Tallis & Eysenck, 1994). Thus, this measure constitutes a reasonable proxy for perceived psychological distance of the Ebola threat.

This is what we would like you to do today. Please take a few minutes to think and write about your deepest thoughts and feelings surrounding Ebola **using the first-person pronouns, "I" and "my."**

Please use these parts of speech as much as possible as you try to understand your thoughts and feelings surrounding Ebola. In other words, ask yourself, "Why am ***I*** feeling this way? "What are the underlying causes and reasons for ***my*** feelings?" and then answer those questions using first-person pronouns.

Participants in the 3rd person self-talk group received the following instructions:

Some people report thinking about current events in the **third-person**. For example, they use **their own name** and **third-person pronouns** such as **"he" or "she"** as they reflect on their thoughts and feelings surrounding current events and ask themselves, "Why is [Your Name] feeling this way?"

This is what we would like you to do today. Please take a few minutes to think and write about your deepest thoughts and feelings surrounding Ebola **using your own name and third-person pronouns such as "he" and "she."**

Please use these parts of speech as much as possible as you try to understand your thoughts and feelings surrounding Ebola. In other words, ask yourself, **"Why is [Your Name] feeling this way?"** "What are the underlying causes and reasons for ***his*** feelings?" and then answer those questions using **your own name** and **third-person pronouns.**

Participants then pressed the "next" button to continue and were provided with a text box to write their responses. Above the text box we included the following set of instructions to remind them how to think and write about their thoughts and feelings about Ebola:

Remember to use the **first-person pronoun "I"** [**your own name and third-person pronouns, for example, "he" or "she"**] as much as possible as you try to understand

the thoughts and emotions you are currently experiencing around Ebola.

Participants were given as much time as they needed to write their essays. Third-person self-talk participants spent marginally more time (M = 3.37 min, SD = 2.60 min) writing their responses compared to 1st person participants (M = 3.09 min, SD = 2.47 min; $t(1006) = -1.75$, $p = .081$), but controlling for this variable did not influence any of the results reported below—all path coefficients remained at similar levels of significance. Therefore, we do not discuss this variable further. The two groups did not differ on the overall number of words they used in their essays, $t(1006) = -0.48$, $p = .635$.

Degree of 3rd and 1st Person Language Use

Although our manipulation directly targeted participants' use of 3rd vs. 1st person singular language in their writing samples, we reasoned that there would nonetheless be variability in the degree to which participants used these different parts of speech in each condition. Therefore, we created 3rd and 1st person language-use variables to examine the role that this variability plays in impacting fact-based, rational thinking.

1st person singular language use (e.g., I, me, my) was computed as a percentage of each participant's essay via Linguistic Inquiry Word Count (LIWC), an automated text analysis software package(Pennebaker, Booth, & Francis, 2007). We converted 1st person scores to count scores by multiplying LIWC percentages by each participant's word count (M = 3.30, SD = 3.98). We used count scores (rather than percentages) because our statistical models controlled for overall word count. Because LIWC does not contain a dictionary that automatically codes for the use of 3rd person singular pronouns or one's name when referring to the self, we manually coded for this variable by counting the number of times participants used their own name and 3rd person singular pronouns to refer to the self (M = 2.41, SD = 3.43).

As expected, participants in the 1st person self-talk group used significantly more 1st person singular pronouns compared to participants in the 3rd person group, $t(1006) = -31.21$, $p < .001$, $d = 1.97$, and participants in the 3rd person group used more 3rd person singular language compared to participants in the 1st person group, $t(1006) = 35.34$, $p < .001$, $d = 2.23$.

See supplement for analyses examining the independent role that 1st and 3rd person language use played in the current study.

Writing Sample Content Analyses

Two judges blind to condition content-analyzed participants' writing samples for whether they described reasons not to worry about Ebola (no = 0, yes = 1). To ensure that coders remained blind to conditions, all 3rd person essays were converted into 1st person essays before judges commenced coding (e.g., names and 3rd person pronouns were replaced with "I" or other relevant 1st person pronouns). After establishing reliability ($\kappa = .88$), judges discussed cases on which they disagreed to reach consensus.

Once judges determined which essays contained reasons not to worry, they performed additional coding to determine whether these essays described *fact-based reasons not to worry about Ebola* (no reasons = 0, reasons = 1; $\kappa = .81$), the specific construct that we were interested in a priori—i.e., mentioning facts regarding the Ebola disease (e.g., "I know the disease is not transmitted via the air but rather by transmission [through] body fluids") and medical infrastructure in the United States for combatting an Ebola epidemic (e.g., "[the] medical facilities in the U.S. are much better able to cope with and isolate instances [of Ebola] when the disease appears, as opposed to the very ill-prepared areas in Africa."). Discrepancies between judges were resolved after initial reliability was demonstrated. 52.88% of essays contained fact-based reasons not to worry about Ebola. Of the essays that contained reasons not to worry about Ebola, 81.62% mentioned fact-based reasons (see Supplement for additional analyses on another type of reason provided—media sensationalism [e.g., "news outlets are purposely sensationalizing [Ebola] for ratings").

Post Manipulation Ebola Worry

After writing their responses, participants answered the following three questions to assess how worried they were about Ebola using a sliding scale: How worried are you about Ebola? (0 = "Not at all worried" to 10 = "Extremely worried"; $M = 3.87$, $SD = 3.26$); What is your current level of worry around the issue of Ebola? (0 = "Not at all anxious" to 10 = "Extremely anxious"; $M = 3.39$, $SD = 3.03$); How worried are you about getting Ebola? (0 = "Not at all worried" to 10 = "Extremely worried"; $M = 2.73$, $SD = 2.98$). Scores on these measures were highly correlated ($\alpha = .96$) and summed to form a single index of Ebola-related worry.

Ebola Risk Probability

After rating how worried they were about Ebola, participants estimated the probability out of 100% that they would contract Ebola, $M = 5.57\%$, $SD = 12.03\%$ (range: 0 – 90%). Risk

probability was entered in models on a 0.0 – 1.0 scale. 18.55% of participants reported a 0% probability of contracting Ebola.

Ebola Risk Persistence

Next, participants were asked to indicate how long they thought Ebola would remain a concern in the United States on a 1 (less than a week) to 5 (more than a year) scale, $M = 3.55$, $SD = 0.97$. We administered this measure to assess participants' general risk perception. That is, their concern about Ebola being a concern for the nation as a whole, rather than for them individually.[3] We administered this item in addition to the Ebola Risk Probability measure described above because we were interested in assessing both personal and general risk perception, which prior research has drawn a distinction between (Sjoberg, 2000; Tyler & Cook, 1984).

Distance from Ebola Cases

We calculated participants' physical proximity from either of the two documented cases of Ebola in the US (Dallas, TX and Manhattan, NY) by computing the distance (in miles) between participant's city of residence and Dallas and Belleview Hospital in New York City. Eleven subjects reported their city of residence outside of the lower 48 states (i.e., Alaska or Hawaii), which skewed the data, so these subjects were recoded with the maximum value of subjects in the contiguous 48 states (adjusted Dallas distance $M = 1004.31$ miles, $SD = 390.98$ miles; adjusted New York distance $M = 1035.04$ miles, $SD = 826.64$ miles). The groups did not differ on either of these variables, $ts(1000) < |0.40|$, $ps > .70$.

Socioeconomic Status (SES)

Education and income were combined to create a composite SES variable. Education was collapsed into three levels consisting of -1 = less than high school and high school/GED, 0 = associate's and bachelor's, 1 = Master's and professional degrees, and income was converted into a numeric variable with six levels. Both variables were z-scored and averaged to form a single SES variable. Seven subjects were missing data on this variable. The groups did not differ on this variable, $t(999) = -1.22$, $p = .22$.

[3] The item we used to assess Ebola risk persistence demonstrates good face validity and reasonable discriminative and convergent validity (i.e., it correlates positively with the Ebola Worry and Ebola Probability items and negatively with Fact-based reasoning). Critically, none of the significant correlations we observed between the above variables were so strong to suggest that this item was redundant with the other measures we administered.

Results

Overview of analyses

We used path models to test the theoretical model guiding our research. Path models were run in R 3.1.2 using the lavaan 0.5-20 package (Rosseel, 2012). Because our main mediator variable, fact-based reasons not to worry, was an endogenous binary variable, and the distributions of other variables (e.g., Ebola probability, baseline Ebola worry, distance from an Ebola case) were skewed, we used a diagonally weighted least squares estimator that does not make assumptions about the underlying distributions of variables and can accommodate binary variables (Finney & DiStefano, 2006; Nye & Drasgow, 2010). Model estimates were bootstrapped 1,000 times.

Note that we do not report beta values and confidence intervals for the indirect effects that explain the relationship between condition and each of the outcome variables we assessed. Such effects are typically calculated with a product of coefficients approach, but when including non-normally distributed endogenous variables (in the current case, fact-based reasoned not to worry about Ebola) this calculated beta is not interpretable (Hayes, 2013; Valeri & VanderWeele, 2013). Nevertheless, it is worth noting that the 95% confidence intervals characterizing the indirect effect of condition on each of our three outcome variables did not include zero.

Moderation analyses. We were uncertain about which, if any links in our theoretical model participants' baseline levels of worry surrounding Ebola would moderate. Therefore we initially examined whether baseline Ebola worry moderated each link in our model after standardizing baseline Ebola worry scores. The final model we report included the Condition X Baseline Ebola worry term at all paths where a significant relationship was observed (Fact usage → Ebola worry, Fact usage → Ebola probability, and Fact usage → Ebola persistence). Baseline Ebola worry and essay word counts were controlled for at all model paths.

Model fit indexes. Model fit was primarily evaluated using CFI and RMSEA, which both provide an estimate of model fit per degree of freedom. CFI is a "goodness of fit" statistic with values above .90 and .95 indicating adequate and good fits, respectively, and RMSEA is a "badness of fit" statistic with values below 0.08 and 0.05 suggesting adequate and good fits, respectively. TLI and NFI are suggested to be higher than 0.95 (L.-t. Hu & Bentler, 1998; L. t. Hu & Bentler, 1999).

Effect sizes. Unlike univariate and multivariate tests, there are no straightforward ways to quantify effect sizes in SEM. We nevertheless sought to provide readers with a way of drawing inferences about the effects sizes characterizing the different significant links we observed in our model in two ways. First, in the case of a categorical variable (e.g., condition) predicting a continuous measure (e.g., 3rd vs. 1st person language use) we describe how a shift in the categorical variable (e.g., 1st person group to 3rd person group) shifts the dependent variable in terms of standard deviation units (e.g. "Condition shifted language usage by X standard deviations…"). These differences approximate Cohen's d and are hence denoted *Effect Size* d_{apx}. Second, in the case of a continuous variable (e.g., 3rd vs. 1st person language use) predicting a categorical measure (e.g., fact-based reasons not to worry about Ebola), we describe how participants one standard deviation above/below the mean compare in percentage terms on their likelihood of shifting from one level to the other on the dependent variable.

Primary Analyses

As expected, participants in the 3rd person self-talk group used more 3rd vs. 1st person language than participants in the 1st person self-talk group when they reasoned about Ebola, b = 10.68, 95% CI = [10.23, 11.14], *Effect Size* d_{apx} = 1.63. This shift in language use predicted increases in participants' tendency to generate fact-based reasons not to worry about Ebola, b = 0.023, 95% CI = [0.002, 0.045]—participants who scored high on 3rd vs. 1st person language use (i.e., one standard deviation above the mean) were 10.45% more likely to generate fact-based reasons not to worry about Ebola compared to participants who scored low on this variable (i.e., one standard deviation below the sample mean; see Figure 2 and Table 3). Neither of the above results were moderated by baseline Ebola worry (see Table 4).

Baseline Ebola worry did, however, moderate the links between fact-based reasoning and each of the outcome variables we assessed. As Figure 2 and Table 3 illustrate, the more worried participants were about Ebola at the start of the study, the more generating fact-based reasons not to worry predicted reductions in their Ebola worry, *Effect Size* d_{apx} = .38, judgments about how likely they were to contract Ebola, *Effect Size* d_{apx} = .75, and estimates of how long Ebola would remain a concern in the United States, *Effect Size* d_{apx} = .29.

In contrast, the relationships between generating fact-based reasons not to worry about Ebola and each of the outcome variables we assessed were not significant among participants who scored low on baseline Ebola worry with one exception—focusing on fact-based reasons

predicted slightly higher Ebola probability estimates among low baseline Ebola worry participants. One interpretation of this finding is that people who came into the study not worried about Ebola initially underestimated their potential risk, and thinking about the facts surrounding the disease made them aware of this. This interpretation notwithstanding, the magnitude of this effect was considerably weaker (a 0.26% *increase* in likelihood estimates) in comparison to the beneficial effect we observed of focusing on facts for high baseline Ebola worry participants (a 7.18% *decrease* in likelihood estimates). Thus, the benefits of the intervention for this variable were 27.62 times larger than its cost.

All model fit statistics indicated that the above model fit the data well (model comparative fit index (CFI) = 1.00, Tucker-Lewis Index (TLI) = 0.997, normed fit index (NFI) = 0.999, root mean square error of approximation (RMSEA) = 0.021.

We also examined whether the aforementioned findings held when several theoretically relevant covariates were simultaneously added to the analyses, including participants' physical proximity to a documented case of Ebola in Dallas or New York City, gender, and socioeconomic status. As Table 3 indicates, including these covariates did not substantively alter the results we reported above; all model fit indices indicated that the model including these additional covariates continued to fit the model well: CFI = 1.00, TLI = 1.00, NFI = 1.00, RMSEA = .003.

----Figure 2 Here----

----Table 3 Here----

----Table 4 Here----

Discussion

Despite public health officials' repeated reassurances that the actual risk of an Ebola epidemic in the United States was small during the Fall of 2014, anxiety gripped the United States for several weeks—a familiar phenomenon that plays out to varying degrees across the globe every time a new disease (e.g., H1N1, Asian Bird Flu, etc.) is introduced. The current findings demonstrate that under such circumstances, cueing vulnerable individuals to engage in 3rd person self-talk has the potential to adaptively transform the way they reason about such threats.

At a basic level, these findings shed light on how 3rd person self-talk promotes rational thinking—by identifying fact-based reasons not to worry about Ebola. They also suggest that a linear dose-response relationship underlies the effect of 3rd person language use on rational thinking. Specifically, although participants in the 3rd person group used more 3rd vs. 1st person language overall when reasoning about Ebola compared to participants in the 1st person group, the degree to which they used 3rd vs. 1st person language predicted the extent to which they were likely to generate fact-based reasons not to worry.

The current results also contribute to a growing body of research suggesting that self-distancing techniques are particularly effective for vulnerable individuals (Kross & Ayduk, 2009; Kross et al., 2012; Park et al., 2014; Penner et al., 2015), as participants who scored low on baseline Ebola worry did not display reductions in Ebola worry and risk perception as a function of the intervention. One interpretation of this finding is that a certain level of negative emotion is needed for this technique to be effective. For people experiencing little or no negative affect to start with, there may be little room for 3rd person self-talk to have an emotion regulatory effect.

It is notable that the manipulation we tested in this study was administered in a relatively "noisy" environment—i.e., participants living across the United States completed the study outside the laboratory. That we observed statistically significant effects in spite of these uncontrolled conditions speaks to the potential scalability of this intervention.

Future research

Future research is needed to examine whether these findings generalize to other anxiety-provoking contexts surrounding the threat of infectious disease. In this vein, it is important to recognize that the objective risk of contracting Ebola in the United States was quite low. Thus, we predicted (and found) that increasing the accessibility of this information via 3rd person self-talk would reduce participants' worry and risk perception. It is possible that using 3rd person self-talk to reason about diseases that are more easily contractible (e.g., Zika) might not have the same effect. In such cases, thinking about the facts surrounding disease transmission might not serve to reduce worry and risk perception and might even amplify it.

Finally, although third person self-talk predicted reductions in Ebola worry and risk perception among high baseline worry participants, it increased participants estimates of how likely they would be to contract Ebola among low baseline Ebola worry participants. We are cautious about over interpreting this finding given that it was not predicted, and we did not see

this pattern emerge across the other two dependent variables we administered. However, it raises an interesting possibility—that the consequences of thinking rationally about specific health risks may be quite different for people who are particularly worried about their health compared to those who are not. For worried participants who tend to overestimate their risk, thinking about the facts surrounding the possibility of contracting disease may reduce their worry and risk perception. But for non-worried participants who tend to underestimate their risk the reverse may be true—thinking about the facts surrounding disease contraction may *enhance* their worry and risk perception. Future research is needed to explore this possibility.

Caveats

Three caveats are in order before concluding. First, although 3rd person self-talk influenced each of our outcome variables indirectly, we observed a direct effect of condition on only one of our outcome variables (Ebola Persistence; Table 1).[4] Although researchers have traditionally been reluctant to interpret indirect effects in the absence of direct effects, over the past decade a consensus has emerged which suggests that direct effects need not (and should not) be required to establish indirect effects, especially when indirect effects are theory-guided as in the current work (Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011; Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010).

That said, the fact that we did not observe consistently significant direct effects suggests that 3rd person self-talk may activate additional processes beyond rational thinking that have opposite effects on our outcome variables. For example, it is possible that the novelty associated with asking participants to reflect on their feelings about Ebola using their name outside of the laboratory enhanced their general levels of uncertainty, which positively influenced their worry and personal risk perception (Hirsh, Mar, & Peterson, 2012). Future research should address this possibility and is important for refining our understanding of how third person self-talk operates outside the laboratory and enhancing its potential application value—i.e. interventions could be designed to reduce feelings of uncertainty surrounding the use of this technique, thus potentially strengthening the direct effects of the intervention to the levels observed in laboratory studies (Kross et al., 2014).

Second, attrition was higher and baseline Ebola worry was marginally lower in the 3rd

[4] There is no obvious theoretical reason for why this variable demonstrated a direct effect whereas the other two variables did not. Thus, we are cautious not to over interpret this result.

person self-talk group. Although we cannot determine why this occurred, it is possible that this may have resulted from either random chance or the novelty of the 3rd person writing instructions, which could have as noted above aroused feelings of uncertainty and discomfort. Critically, all results controlled for baseline Ebola worry. Moreover, moderation analyses indicated that the more worried participants were about Ebola at baseline the more they benefited from the manipulation. This suggests that these differences likely worked against us finding evidence to support our predictions. That is, having fewer high worry participants in the 3rd person condition, and having the 3rd person self-talk manipulation be stronger for participants with higher baseline worry likely made it harder to find effects.

Finally, we used single items to measure Ebola risk probability and persistence. Future research should consider using multi-item measure to reduce measurement noise.

Concluding Comment

These findings provide preliminary evidence highlighting the potential utility of 3rd person self-talk for helping vulnerable individuals think more rationally about pressing public health concerns, in ways that reduce their worry and risk perception. More broadly, they highlight the value of examining how laboratory research on the self and emotion regulation translate to real world contexts (Bryan, Walton, Rogers, & Dweck, 2011; Finkel, Slotter, Luchies, Walton, & Gross, 2013; Walton, 2014).

References

Beck, A. T. (1970). Cognitive therapy: Nature and relation to behavior therapy. *Behavior Therapy, 1*(2), 184-200. doi:10.1016/S0005-7894(70)80030-2

Berenbaum, H., Thompson, R. J., & Bredemeier, K. (2007). Perceived threat: Exploring its association with worry and its hypothesized antecedents. *Behavioral Research and Therapy, 45*(10), 2473-2482. doi:10.1016/j.brat.2007.03.015

Bernstein, A., Hadash, Y., Lichtash, Y., Tanay, G., Shepherd, K., & Fresco, D. M. (2015). Decentering and Related Constructs: A Critical Review and Metacognitive Processes Model. *Perspectives on Psychological Science, 10*(5), 599-617. doi:10.1177/1745691615594577

Bryan, C. J., Walton, G. M., Rogers, T., & Dweck, C. (2011). Motivating voter turnout by invoking the self. *Proceedings of the National Academy of Sciences, 108*(31), 12653-12656. doi:10.1073/pnas.1103343108

Chandran, S., & Menon, G. (2004). When a day means more than a year: Effects of temporal framing on judgments of health risk. *Journal of Consumer Research, 31*(2), 375-389. doi:10.1086/422116

Diaz, R. M., & Berk, L. E. (1992). *Private speech: From social interaction to self-regulation*. Hillsdale, NJ: L. Erlbaum.

Dolcos, S., & Albarracin, D. (2014). The inner speech of behavioral regulation: Intentions and task performance strengthen when you talk to yourself as a you. *European Journal of Social Psychology, 44*, 636-642. doi:10.1002/ejps.2048

Finkel, E. J., Slotter, E. B., Luchies, L. B., Walton, G. M., & Gross, J. J. (2013). A brief intervention to promote conflict reappraisal preserves marital quality over time. *Psychological Science, 24*(8), 1595-1601. doi:10.1177/0956797612474938

Finney, S. J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural Equation Modeling: A Second Course* (Vol. 10, pp. 269-314). Charlotte, NC: Information Age publishing.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90*(3), 351-367. doi:10.1037/0022-3514.90.3.351

Grossmann, I., & Kross, E. (2014). Exploring Solomon's paradox: Self-distancing eliminates the self-other asymmetry in wise reasoning about close relationships in younger and older adults. *Psychological Science, 25*(8), 1571-1580. doi:10.1177/0956797614535400

Hayes, A. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408-420. doi:10.1080/03637750903310360

Hayes, A. (2013). *Introduction to mediation, moderation and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Hirsh, J. B., Mar, R. A., & Peterson, J. B. (2012). Psychological entropy: a framework for understanding uncertainty-related anxiety. *Psychological Review, 119*(2), 304-320. doi:10.1037/a0026767

Hu, L.-t., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424. doi:10.1037/1082-989X.3.4.424

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55. doi:10.1080/10705519909540118

Kohlberg, L., Yaeger, J., & Hjertholm, E. (1968). Private speech: four studies and a review of theories. *Child Development, 39*(3), 691-736. doi: 10.2307/1126979

Kross, E., & Ayduk, O. (2009). Boundary conditions and buffering effects: Does depressive symptomology moderate the effectiveness of distanced-analysis for facilitating adaptive self-reflection? *Journal of Research in Personality, 43*(5), 923-927. doi:10.1016/j.jrp.2009.04.004

Kross, E., & Ayduk, Ö. (2011). Making meaning out of negative experiences by self-distancing. *Current Directions in Psychological Science, 20*(3), 187-191. doi:10.1177/0963721411408883

Kross, E., Bruehlman-Senecal, E., Park, J., Burson, A., Dougherty, A., Shablack, H., . . . Ayduk, O. (2014). Self-talk as a regulatory mechanism: How you do it matters. *Journal of Personality and Social Psychology, 106*(2), 304-324. doi:10.1037/a0035173

Kross, E., Gard, D., Deldin, P., Clifton, J., & Ayduk, O. (2012). "Asking why" from a distance: its cognitive and emotional consequences for people with major depressive disorder. *Journal of Abnormal Psychology*, *121*(3), 559-569. doi:10.1037/a0028808

Mischel, W., & Rodriguez, M. L. (1993). Psychological distance in self-imposed delay of gratification. In R. R. Cocking & K. A. Renninger (Eds.), *The development and meaning of psychological distance* (pp. 109-121). Hillsdale, NJ: L. Erlbaum.

Moser, J. S., Dougherty, A., Mattson, W. I., Katz, B., Moran, T. P., Guevarra, D., . . . Kross, E. (2017). Third-person self-talk facilitates emotion regulation without engaging cognitive control: Converging evidence from ERP and fMRI. *Scientific Reports, 7*(1), 4519. doi:10.1038/s41598-017-04047-3

Nook, E. C., Schleider, J. L., & Somerville, L. H. (2017). A linguistic signature of psychological distancing in emotion regulation. *Journal of Experimental Psychology: General*, 337-346. doi:10.1037/xge0000263

Nye, C. D., & Drasgow, F. (2010). Assessing goodness of fit: Simple rules of thumb simply do not work. *Organizational Research Methods*, 14(3), 548-570. doi:10.1177/1094428110368562

Park, J., Ayduk, O., O'Donnell, L., Chun, J., Gruber, J., Kamali, M., . . . Kross, E. (2014). Regulating the High: Cognitive and Neural Processes Underlying Positive Emotion Regulation in Bipolar I Disorder. *Clinical Psychological Science, 2*(6), 661-674. doi:10.1177/2167702614527580

Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). Linguistic inquiry and word count: LIWC [Computer software]. Austin, TX: liwc.net.

Penner, L. A., Gueverra, D., Harper, F. W. K., Taub, J., Phipps, S., Albrecht, T. L., & Kross, E. (2015). Self-distancing buffers high trait anxious pediatric cancer caregivers against short- and longer-term distress. *Clinical Psychological Science, 4*(4), 629-640. doi:10.1177/2167702615602864

Harvard School of Public Health. (2014). [Graph illustration population thoughts on ebola]. *SRSS Poll: Ebola Poll II*. Retrieved from https://cdn1.sph.harvard.edu/wp-content/uploads/sites/21/2014/10/Ebola-II-Press-Release-Slides-15-October-14_final.pdf

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1-36. doi:10.18637/jss.v048.i02

Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass, 5*(6), 359-371. doi:10.1111/j.1751-9004.2011.00355.x

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422-445. doi:10.1037/1082-989X.7.4.422

Sjoberg, L. (2000). Factors in risk perception. *Risk Analysis, 20*, 1-12. doi:10.1111/0272-4332.00001

Streamer, L., Seery, M. D., Kondrack, C. L., Lamarche, V. M., & Saltsman, T. L. (2017). Not I, but she: The beneficial effects of self-distancing on challenge/threat cardiovascular responses. *Journal of Experimental Social Psychology, 70*, 235-241. doi:10.1016/j.jesp.2016.11.008

Tallis, F., & Eysenck, M. W. (1994). Worry: Mechanisms and modulating influences. *Behavioural and Cognitive Psychotherapy, 22*, 37-56. doi:10.1017/S1352465800011796

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review, 117*(2), 440-463. doi:10.1037/a0018963

Tyler, T. R., & Cook, F. L. (1984). The mass media and judgments of risk: Distinguishing impact on personal and societal level judgments. *Journal of Personality and Social Psychology, 47*(4), 693-708. doi:10.1037/0022-3514.47.4.693

Valeri, L., & VanderWeele, T. J. (2013). Mediation analysis allowing for exposure-mediator interactions and causal interpretation: Theoretical assumptions and implementation with SAS and SPSS macros. *Psychological Methods, 18*(2), 137-150. doi:10.1037/a0031034

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: M.I.T. Press.

Walton, G. M. (2014). The new science of wise psychological interventions. *Current Directions in Psychological Science, 23*(1), 73-82. doi:10.1177/0963721413512856

Wisco, B. A., & Nolen-Hoeksema, S. (2011). Effect of visual perspective on memory and interpretation in dysphoria. *Behaviour Research and Therapy, 49*, 406-412. doi:10.1016/j.brat.2011.03.012

Zell, E., Warriner, A., & Albarracin, D. (2012). Splitting of the mind: When the you I talk to is me and needs commands. *Social Psychological and Personality Science, 3*(5), 549-555. doi:10.1177/1948550611430164

Zhao, Z., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197-206. doi:10.1086/651257

Table 1. Participant Characteristics

Demographic Variable	Percentage
Race	
White	76.59%
African American	7.54%
Hispanic/Latino	5.26%
Asian American	5.16%
Multiracial	3.48%
Other	1.49%
No response	0.50%
Education Level	
< High School	0.50%
High School/GED	31.35%
Associate's Degree	13.29%
Bachelor's Degree	38.49%
Master's & Professional Degree	15.87%
No response	0.50%
Annual Income	
< $15,000	22.12%
$15,000 – $25,000	17.46%
$25,000 – $45,000	25.79%
$45,000 – $65,000	17.49%
$65,000 – $85,000	8.83%
> $85,000	7.24%

Table 2. Means, standard deviations, number of observations, and zero-order correlations for key study variables across participants.

	Variable	M	SD	n	1	2	3	4	5	6	7	8	9
1	Post Manipulation Ebola Worry	9.99	8.90	1008	--	**.56**	**.45**	**-.50**	**-.07**	**.90**	-.03	.00	.01
2	Post Manipulation Ebola Probability	5.57%	12.03%	1008		--	**.26**	**-.32**	-.04	**.48**	.00	.01	-.04
3	Post Manipulation Ebola Persistence	3.55	0.97	1008			--	**-.28**	-.02	**.41**	-.05	.01	.03
4	Fact-Based Reasons	0.53	0.50	1008				--	**.09**	**-.46**	.03	-.01	.01
5	3rd - 1st Person Language Use[1]	-0.89	6.54	1008					--	**-.08**	.04	.03	.06
6	Baseline Ebola Worry	3.91	3.31	1008						--	-.04	-.02	.00
7	Distance From Dallas	1004.31	390.98	1002							--	.05	.05
8	Distance From NYC	1035.04	826.64	1002								--	**-.12**
9	Socioeconomic Status (SES)	0.00	0.82	1001									--

Note. Bold correlation coefficients are significant at $p < .05$. Correlations were performed on all available data. Thus, degrees of freedom vary slightly across cells because of missing data. Outlier adjusted means (see Methods for description) are presented for

the distance from NYC & Dallas variable. All correlations reported are zero-order with the exception of those involving the 3rd – 1st Person Language Use, which controlled for essay word count as well.

Table 3. Parameter estimates for primary and covariate analyses.

	Primary Model			Covariate Model		
	Beta (SE)	**95% CI**	**Std. B**	**Beta (SE)**	**95% CI**	**Std. B**
Model Pathways						
Con → Language Use	10.682 (0.231)	[10.225, 11.137]	0.817	10.677 (0.245)	[10.191, 11.142]	0.815
Language Use → Facts	0.023 (0.011)	[0.002, 0.045]	0.120	0.024 (0.012)	[0.002, 0.049]	0.129
Con → Fact Usage	-0.138 (0.150)	[-0.434, 0.156]	-0.056	-0.158 (0.158)	[-0.457, 0.155]	-0.064
Con → Worry	-0.145 (0.437)	[-1.011, 0.748]	-0.008	-0.149 (0.441)	[-1.057, 0.734]	-0.008
Con → Probability	0.009 (0.012)	[-0.013, 0.033]	0.038	0.008 (0.011)	[-0.013, 0.032]	0.034
Con → Persistence	-0.201 (0.103)	[-0.415, -0.004]	-0.104	-0.220 (0.105)	[-0.430, -0.010]	-0.114
Language Use → Worry	0.026 (0.037)	[-0.051, 0.101]	0.019	0.022 (0.037)	[-0.051, 0.095]	0.017
Language Use → Probability	0.000 (0.001)	[-0.002, 0.001]	-0.010	0.000 (0.001)	[-0.002, 0.001]	-0.012
Language Use → Persistence	0.017 (0.008)	[0.002, 0.034]	0.116	0.018 (0.008)	[0.001, 0.034]	0.123
Baseline Ebola Worry → Language Use	-0.178 (0.124)	[-0.419, 0.081]	-0.027	-0.172 (0.119)	[-0.411, 0.061]	-0.026
Baseline Ebola Worry → Facts	-0.676 (0.048)	[-0.780, -0.587]	-0.551	-0.680 (0.049)	[-0.784, -0.592]	-0.552
Baseline Ebola Worry → Worry	7.055 (0.177)	[6.660, 7.386]	0.793	6.997 (0.182)	[6.637, 7.335]	0.787
Baseline Ebola Worry → Probability	0.036 (0.006)	[0.024, 0.047]	0.302	0.035 (0.005)	[0.022, 0.044]	0.289
Baseline Ebola Worry → Persistence	0.272 (0.038)	[0.197, 0.347]	0.281	0.257 (0.039)	[0.177, 0.332]	0.265
High Baseline Ebola Worry						
Facts → Worry	-2.898 (0.406)	[-3.721, -2.131]	-0.250	-2.940 (0.404)	[-3.736, -2.130]	-0.252
Facts → Probability	-0.071 (0.013)	[-0.096, -0.047]	-0.432	-0.071 (0.013)	[-0.096, -0.048]	-0.430
Facts → Persistence	-0.302 (0.071)	[-0.444, -0.169]	-0.267	-0.304 (0.071)	[-0.446, -0.171]	-0.271
Low Baseline Ebola Worry						

Facts → Worry	0.500 (0.273)	[-0.050, 1.014]	-0.080	0.553 (0.280)	[-0.003, 1.094]	-0.078
Facts → Probability	0.019 (0.007)	[0.003, 0.032]	-0.102	0.020 (0.007)	[0.005, 0.033]	-0.094
Facts → Persistence	-0.017 (0.077)	[-0.174, 0.128]	-0.136	-0.021 (0.077)	[-0.182, 0.127]	-0.141

Note. Betas, SEs, 95% CIs, and standardized betas are reported. Con=Condition, Language Use=3rd - 1st person language use, Facts=Fact-based Reasons Not to Worry About Ebola, Worry=Ebola Worry, Probability=Ebola Probability, Persistence = Ebola Persistence, Baseline Ebola Worry =standardized baseline Ebola worry. Primary model=Model described under "primary analyses." Covariate model=Model including covariates. Both models control for word count (in addition to baseline Ebola worry) at all links.

Table 4. Moderation estimates by baseline Ebola worry for primary and covariate analyses.

	Primary Model			Covariate Model		
Moderation Path Estimate	**Beta (SE)**	**95% CI**	**Std. B**	**Beta (SE)**	**95% CI**	**Std. B**
Con → Language Use	-0.484 (0.362)	[-1.148, 0.271]	-0.074	-0.519 (0.364)	[-1.166, 0.255]	-0.079
Language Use → Facts	0.015 (0.013)	[-0.008, 0.040]	0.083	0.013 (0.013)	[-0.012, 0.038]	0.071
Facts → Worry	-1.691 (0.303)	[-2.294, -1.091]	-0.084	-1.736 (0.293)	[-2.296, -1.155]	-0.087
Facts → Probability	-0.045 (0.008)	[-0.061, -0.030]	-0.165	-0.045 (0.008)	[-0.061, -0.030]	-0.168
Facts → Persistence	-0.153 (0.063)	[-0.273, -0.026]	-0.070	-0.153 (0.067)	[-0.282, -0.026]	-0.070
Con → Facts	-0.061 (0.084)	[-0.226, 0.103]	-0.050	-0.042 (0.085)	[-0.210, 0.114]	-0.034
Con → Worry	-0.090 (0.243)	[-0.560, 0.383]	-0.010	-0.082 (0.228)	[-0.518, 0.379]	-0.009
Con → Probability	0.009 (0.008)	[-0.007, 0.024]	0.073	0.008 (0.008)	[-0.008, 0.023]	0.064
Con → Persistence	0.011 (0.053)	[-0.098, 0.113]	0.012	0.014 (0.054)	[-0.086, 0.127]	0.014
Language Use → Worry	0.015 (0.041)	[-0.074, 0.092]	0.011	0.013 (0.039)	[-0.068, 0.086]	0.009
Language Use → Probability	-0.001 (0.001)	[-0.003, 0.001]	-0.059	-0.001 (0.001)	[-0.003, 0.001]	-0.057
Language Use → Persistence	0.008 (0.008)	[-0.008, 0.024]	0.054	0.008 (0.009)	[-0.010, 0.023]	0.052

Note. Betas, standard errors (SEs), 95% confidence intervals, and standardized betas are reported. Con = Condition, Language Use = 3rd minus 1st person language usage, Facts = Fact-based Reasons Not to Worry About Ebola, Worry = Ebola Worry, Probability = Ebola Probability, Persistence = Ebola Persistence. Primary model = Model described under "primary analyses." Covariate model = Model described under "covariate analyses." Both models control for word count in addition to baseline Ebola worry at all links.

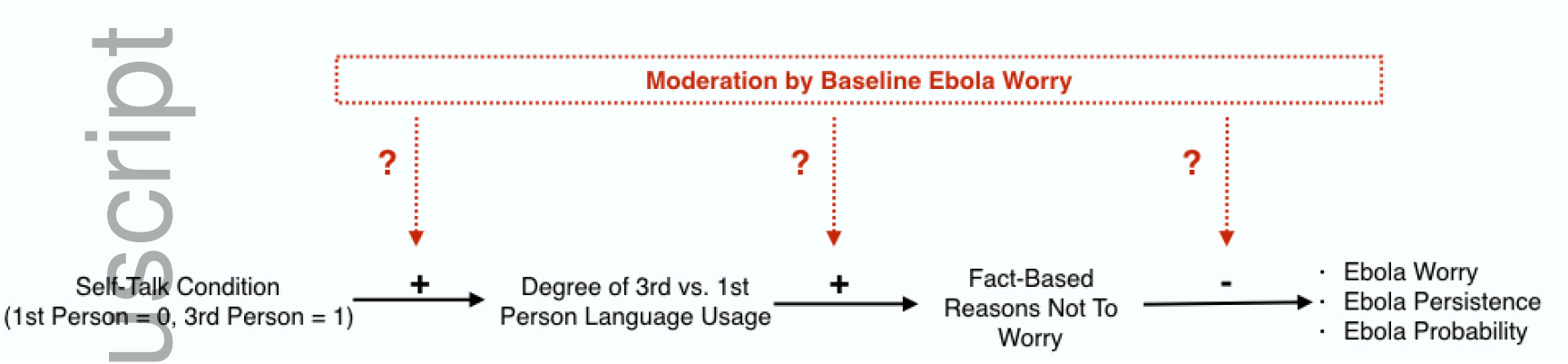

Figure 1. Theoretical Model

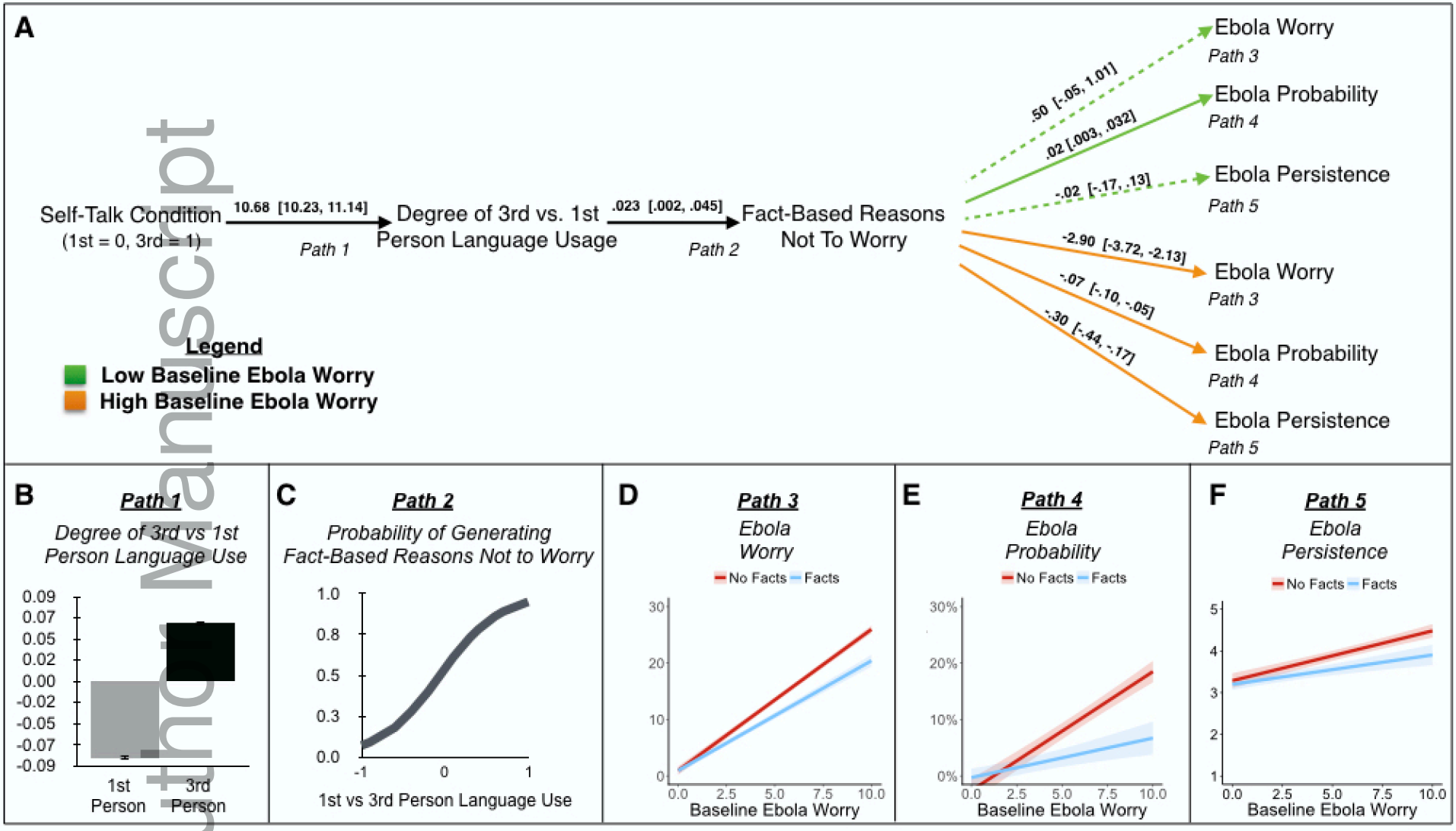

Figure 2. Path Analyses. (A) Indirect pathway demonstrating that the manipulation led all participants to use more 3rd vs. 1st person language in their essays, which enhanced fact-based reasons not to worry. Generating fact-based reason not to worry, in turn, reduced high (but not low) baseline worry participants Ebola worry and risk perception. Bar graphs illustrating the effect of (B) Condition on degree of 3rd vs. 1st Person Language Use. (C) Line graph illustrating the relationship between 3rd vs. 1st Person Language Usage and the probability of generating fact-based reasons not to worry about Ebola. (D-F) Bar graphs demonstrating that generating fact-based reasons not to worry about Ebola ("Facts") led to lower Ebola Worry, Ebola Probability, and Ebola Persistence judgments compared to not generating fact-based reasons ("No Facts") for high baseline Ebola Worry participants but not low baseline Ebola Worry participants. Error bars reflect +/- 1 Standard Error.