Experimental Examination of Message Framing to Increase Dissemination of Evidence-Based Treatments

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Abstract

Anxiety disorders are highly prevalent and cause significant health burden. Fortunately, effective forms of treatment are available, such as cognitive behavioral therapies (CBT), which have demonstrated efficacy for treating anxiety disorders (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; Hofmann & Smits, 2008). However, relatively few individuals seek and receive treatment from healthcare professionals. While there are a number of reasons individuals may not seek treatment, one barrier may be that individuals do not realize that evidence-based treatments are available and effective (Gallo, Comer, & Barlow, 2013). This multi-method dissertation focuses on evaluating ways of framing PTSD and anxiety treatment information, in an effort to find effective ways of promoting evidence-based treatment information and increasing potential consumers' interest in these treatments. Five frameworks and factors associated with health behavior change were used to create messages about evidence-based treatments in the form of subheadings for information on the treatments. The messages were evaluated across four studies on their ability to increase interest and engagement in seeking anxiety treatment.

Study 1 was a set of exploratory field experiments with the American Psychological Association, in which we experimentally manipulated subheadings on three webpages of their post-traumatic stress disorder (PTSD) clinical practice guidelines website. We were particularly interested in website user engagement on the site (e.g., clicking on links to learn more about evidence-based treatments) to assess behaviors tied to seeking treatment. Results indicated that visitors to the For Patients & Families webpage did vary their behavior based on subheadings (in particular, "Treatment works: Say goodbye to symptoms" was associated with the most clicks on the "Find a Psychologist" button). However, subheadings did not affect visitor behavior on the other two pages tested.

Study 2 (N = 578) was a preregistered conceptual replication to study whether similar results would emerge in a web-based research study with a sample of US adults who were not

necessarily seeking treatment information. Study 1 results did not replicate in Study 2. Discussion of these results focuses on how subheadings may only influence individuals' behavior if they are motivated to learn about available treatments. Studies 1 and 2 have been accepted for publication in *Clinical Psychological Science* (Werntz, Bufka, Adams, & Teachman, accepted).

Study 3 consisted of three focus groups of local community members (two groups of individuals with anxiety symptoms [n = 8], one group of individuals who have a family member or close friend with anxiety [n = 3]). In these focus groups, barriers to seeking (or suggesting) anxiety treatment were discussed, with a particular interest in asking how individuals feel about varying messages about evidence-based anxiety treatments. Themes that emerged from focus group conversations included: avoid negative messaging, avoid ambiguity, and know the audience being targeted.

Study 4 was a preregistered online experiment (N = 582) evaluating the credibility of information about treatment and tested demographic variables as predictors of credibility by message type. Latent Profile Analysis (LPA) was used to identify mutually exclusive groups of participants based on responses to headline preferences; three groups emerged. Of the 13 tested demographic predictors of group membership, only percentage of non-White individuals was significantly different across the three groups.

Taken together, this dissertation provides insight into how psychologists and other stakeholders can more effectively disseminate information about treatments that work to potential consumers. The results highlight the importance of examining this topic using different methodologies to understand what individuals want to know and what is more or less effective for whom. The Discussion outlines convergent and divergent results across studies, the importance of replication efforts, ideas for future research, and concrete suggestions for framing treatment information based on available data.

Experimental Examination of Message Framing to Increase Dissemination of Evidence-Based Treatments

Anxiety disorders are highly prevalent and cause significant health burden. Approximately a quarter of American adults will experience an anxiety disorder in their lifetime (Kessler, Berglund, et al., 2005), and direct medical costs for treating anxiety the U.S. were over $33 billion in 2013 (Shirneshan et al., 2013). Moreover, it is the sixth leading cause of disability (Baxter, Vos, Scott, Ferrari, & Whiteford, 2014), and anxiety and stress disorders are one of the most common chronically impairing groups of conditions (Kessler & Greenberg, 2002). On an individual level, anxiety disorders are associated with chronic worrying, functional impairment, social impairment, and physiological responses to feared stimuli (e.g., heart pounding, sweating; American Psychiatric Association, 2013).

Fortunately, there are effective forms of treatment for anxiety. In particular, cognitive behavioral therapies (CBT) have demonstrated efficacy for treating anxiety disorders (Hofmann et al., 2012; Hofmann & Smits, 2008), and some reviews suggest that pharmacotherapy is similarly efficacious (Gould, Otto, Pollack, & Yap, 1997). For example, when considering treatment options for generalized anxiety disorder that does not remit following self-help, the National Institute for Health and Care Excellence (NICE) of the UK suggests allowing patients to choose between pharmacotherapy and CBT as a next treatment step (National Institute for Health and Care Excellence, 2011). Despite there being effective treatments for anxiety disorders, however, most individuals do not receive care. In any given year, less than 20% of individuals suffering from an anxiety disorder will seek care from a healthcare professional (Kessler & Greenberg, 2002). Individuals may not seek mental health treatment for many reasons, including practical concerns (e.g., time, cost, transportation), or because of attitudinal barriers. These attitudinal barriers include individuals wanting to handle the problem on their own, not perceiving that they need treatment (Andrade et al., 2014), and believing that treatment will not be effective (Sareen et al., 2007). Stigma about seeking treatment, as well as

the belief that therapy will elicit unwanted emotions, also contribute to whether someone will consider seeking treatment (Mohr et al., 2010). Critically, leaders in the anxiety treatment field have also suggested that the public may not realize the benefits of evidence-based treatments, which is a major barrier to accessing care (Gallo et al., 2013).

In four studies, this multi-method dissertation will examine how information regarding evidence-based anxiety treatment is most effectively framed to increase potential consumers' interest in these treatments. Study 1 was a set of preliminary field experiments that assessed website users' real-time behavior when reading information regarding evidence-based treatments with different subheadings. Study 2 was a conceptual replication of Study 1, examining whether results from the first study would replicate in a sample of individuals presumably not seeking out information about mental health treatment. Study 3 was a series of three focus groups with potential consumers of anxiety treatment and their family members to examine beliefs and explicit attitudes about message framing for evidence-based anxiety treatment. Finally, Study 4 was a large-scale, web-based test of theoretical models to examine which messages are most appealing to different populations. The results of this dissertation provide preliminary suggestions for how to word information about evidence-based treatment for anxiety as a function of the target audience. These findings can then be implemented in various settings where individuals may seek out mental health treatment information. This information can help psychologists understand how to best frame evidence-based treatments so that more people will seek and receive care, which may ultimately help bridge the treatment gap and lower the overall burden of mental illness.

Increasing Interest in Treatment Information

The Internet is widely used to find health information. In 2006, it was reported that 18% of Internet users used the Internet to find information about mental health (Powell & Clarke, 2006). In 2013, 35% of U.S. adults said they have gone online to seek health information regarding a medical condition that they (or someone they know) may have (Fox & Duggan,

2013). Given people have even more access to the Internet than they did even a few years ago, it is likely that an even greater proportion of individuals have used the Internet for gathering information about mental health treatment than those studies report.

The Internet may be a particularly important way of promoting evidence-based anxiety treatments. When comparing individuals recruited online for a "Social Anxiety Disorder and the Internet" study to those about to start psychotherapy at an anxiety clinic, the online sample rated their social anxiety symptoms as significantly worse than the treatment-seeking group (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004). Among the Internet sample, those with greater (vs. lower) social anxiety symptoms were more likely to endorse having learned about social anxiety and its treatment online. Considering that individuals with social anxiety are, by definition, likely to be avoidant of social situations given their symptoms (American Psychiatric Association, 2013), it makes sense that these individuals would turn to sources for treatment information that do not involve directly interacting with others. Given avoidance characterizes the range of anxiety disorders (American Psychiatric Association, 2013), anxious individuals may be a particularly important group to target through online consumer education campaigns.

Despite being able to search for information about treatment, it remains unclear whether most individuals know that there are evidence-based treatments for anxiety disorders or how to access them. For example, when individuals were asked where they would seek out anxiety treatment information, the most common response was "I don't know" (38%; Schofield, Moore, Hall, & Coles, 2016). In another study, 55% of participants (in an unselected Internet sample) had never heard of exposure therapy (an extremely effective form of psychotherapy for anxiety disorders often found within broader CBT protocols; Arch, Twohig, Deacon, Landy, & Bluett, 2015). Yet another study with an unselected Internet sample found 25% of participants had never heard of CBT (Schofield, Weis, Ponzini, & McHugh, 2017). Thus, there is substantial opportunity to advance individuals' knowledge of evidence-based treatments. The current

studies will help inform how evidence-based treatments can optimally be explained and promoted.

Message framing. Although seeking information about anxiety treatments online is common, it is not clear what motivates an individual to progress from reading information online to actually inquiring about a specific treatment or choosing to engage in treatment. To our knowledge, this multi-method approach will provide initial data on how to effectively frame information about evidence-based treatments such that the information is more appealing or credible.

There is limited work examining how the wording of information regarding evidence-based treatments for any mental health condition influences attitudes about those treatments. In one study with an unselected Internet sample, brief exposure to information about CBT improved attitudes and knowledge about CBT; however, when the experimenters varied the explanations of the mechanisms of change (neurological vs. psychological vs. neuropsychological explanation), the perceptions and credibility of CBT did not differ across conditions (Schofield et al., 2017). This suggests that simply educating individuals about interventions can make attitudes more positive; however, varying descriptions of how the treatment works does not appear to influence attitudes. In an investigation among undergraduate women, researchers manipulated the amount of information provided about prolonged exposure and measured treatment credibility (Feeny, Zoellner, & Kahana, 2009). Credibility ratings of prolonged exposure did not vary depending on whether participants read limited or augmented versions of the treatment rationale, with the augmented version including more detailed information about how prolonged exposure addresses difficulty processing emotional trauma. Treatment credibility also did not vary based on reading more detailed versus limited information about side effects of prolonged exposure. In an investigation among fluent English-speakers who are U.S. residents examining ways to increase exposure therapy credibility, researchers found that reading theoretically-driven descriptions of exposure rationale

caused individuals to rate exposure therapy as more credible than when they had read a very simple definition of the treatment at the beginning of the study (Arch et al., 2015). However, different theoretical descriptions (e.g., describing exposure through a framework of acceptance versus fear tolerance) only had small effects on differences in credibility, suggesting that increased knowledge – not descriptions of mechanisms of change – was critical to influencing credibility of treatment. Following reading the treatment information, 76% of participants reported that they were more likely to do exposure therapy. Note that participants were not selected for anxiety symptoms, although half had sought mental health treatment in the past. Taken together, these findings reveal that information about treatments that work is helpful in increasing treatment credibility among unselected adults. However, more detailed information and varying how the mechanisms of change are framed may not necessarily increase treatment credibility. This suggests the general public may find some information about treatments useful, but not have a need or desire to learn about very detailed mechanisms of change.

In the social psychology field, research has found that small wording differences in persuasive messages can lead to big differences in behaviors (e.g., indicating that previous hotel room guests reuse towels versus a generic environmental message improved rates of reusing towels; Goldstein, Cialdini, & Griskevicius, 2008). In their seminal *Science* article on prospect theory, Tversky and Kahneman (1981) argue that individuals will make different decisions based on message frames because of their perception of probabilities and outcomes. This proposed theory has been applied extensively to the behavioral health domain. The purpose of effectively framing health-related messages is to encourage individuals to take actions toward either starting or maintaining a health-related behavior by leveraging a person's primary concerns.

The current studies examine message framing in the context of mental health treatment decisions, examining the following five ways of framing treatment information to test whether they differentially increase the appeal of CBT:

Gain- versus loss-framing. To-date, considerable research has been dedicated to examining the effect of loss- versus gain-framed messages. Loss-framed messages highlight negative consequences of performing or not performing a behavior, while gain-framed messages highlight the positive consequences of performing or not performing a behavior (Rothman & Salovey, 1997). For example, a gain-framed message could be, "Individuals in cognitive behavioral therapy get better," while a loss-framed message could be, "Individuals who are not in cognitive therapy do not get better." Gain versus loss frameworks have been studied extensively for promoting physical health care behaviors, and they build directly on Tversky and Kahneman's prospect theory. Theoretically, individuals tend to avoid risks when considering potential gains (like getting better as a result of treatment), and prefer to take risks when considering potential losses (like not getting better as a result of not getting treatment; Rothman & Salovey, 1997). Unfortunately, loss- versus gain-framed research in the mental health treatment domain is limited, given that loss- versus gain-framed messages are typically focused on prevention or detection behaviors related to cancer (e.g., using sunscreen to prevent cancer or being screened for existing cancer). In this domain, gain-framed messages typically are more effective for prevention efforts and loss-framed messages typically are more effective for targeting detection (Rothman, Bartels, Wlaschin, & Salovey, 2006). In behavioral economics research, tasks tend to focus on framing losses and gains of monetary rewards. In these tasks, individuals with heightened trait anxiety are more attentive to losses, so may be more willing to take a risk (gamble) if a loss is sure to happen if no action is taken (Hartley & Phelps, 2012). More recent evidence suggests that when compared to healthy controls, individuals with anxiety are more likely to avoid taking gambling risks, but are not more averse to loss than healthy controls (Charpentier, Aylward, Roiser, & Robinson, 2017). If these results are translated into the present research question, it may be the case that individuals with more anxiety may be particularly motivated by messages that highlight the loss associated with *not* seeking treatment, as long as engaging in treatment seems very likely to work.

Trust in science and research. Trust is a relational concept in that one individual believes what another individual or organization is saying or promoting. The healthcare system is built on trust between patients and providers; for a given intervention to work (in both the physical and mental health domains), patients must trust that providers know what they are doing and are choosing the correct therapeutic techniques. Greater trust allows for greater buy-in from patients and better treatment outcomes, because effective care delivery is dependent on both the delivery of good care but also the acceptance of the treatment on the part of the patient (Gilson, 2003). Trust is important in varying degrees among patients; for example, individuals who have extensive knowledge about treatments or who have an acute problem may require less trust in the provider than an individual who does not have any information about potential treatments or an individual who has a chronic or life-threatening illness (Gilson, 2003). In one behavioral health study, trust in scientific experts predicts how much people pay attention to nutritional information (Bleich, Blendon, & Adams, 2007). However, to our knowledge there is no research examining how claims about the research-basis or scientific evidence behind treatments influences consumers' treatment seeking behavior. This dissertation includes messages with this frame to assess whether clear statements about a treatment's efficacy based on science is convincing and appealing to potential consumers and will allow for inferences about the role of trust in anxiety treatment decisions. Given that anxious individuals find intolerance of uncertainty distressing (e.g., in generalized anxiety disorder; Dugas, Buhr, & Ladouceur, 2004), messages backed by science may sound more certain – and more appealing - than messages without clear endorsement. Also, among individuals with specialized knowledge (e.g., in the scientific method), reading that *scientists* endorse a given treatment may be a convincing argument. However, it may be the case that individuals from underrepresented racial and ethnic groups (for whom there are known health and healthcare disparities; National Center for Health Statistics, 2016) may be less likely to trust science, and therefore less likely to find *science*-framed messages persuasive.

Organizational support. In an analysis of focus groups conducted with the general public investigating preferences for educational messages on the genital human papillomavirus (HPV), results suggested that some individuals preferred messages from reputable sources (e.g., US Surgeon General, American Red Cross, Planned Parenthood), with the important caveat that African American participants noted their distrust of government agencies, citing the Tuskegee Study (Allison & Hilda, 2006). Endorsement by trusted authorities (e.g., medical professionals) also appears to increase acceptability of the vaccine among individuals from various lower socio-economic groups (in a review of qualitative research examining attitudes regarding the HPV vaccine; Amrita, 2011). In a different domain, the mental illness stigma reduction literature suggests that contact with individuals with mental illness may reduce stigma against individuals with mental illness, especially when contact is organized by a specific group (Corrigan & Penn, 1999). Very little research is available regarding the influence organizational support may have on how individuals think about approaching mental health treatment; however, this is an important question considering institutions typically host comprehensive treatment information online. For example, the Association for Behavioral and Cognitive Therapies (an organization dedicated to investigating and disseminating evidence-based treatments) is a website with comprehensive treatment information (see http://www.abct.org/Information/?m=mInformation&fa=FactSheets). In the context of this dissertation, examining the influence of organizational support in Studies 3 and 4 is especially important, given Studies 1 and 2 are examine American Psychological Association's materials.

Describing norms. Describing norms (or what others are already doing) helps to change behaviors (Cialdini, Kallgren, & Reno, 1991). As mentioned above, the often-cited study by Goldstein, Cialdini, and Griskevicius (2008) showed that hotel guests who read a note indicating that the majority of hotel guests reuse towels were more likely to reuse their towels (compared to those who read a note citing environmental concerns about reusing towels). In considering how norms may influence individuals' behaviors regarding treatment-seeking,

describing norms may be particularly influential for individuals who experience “self-stigma” regarding their mental health. Self-stigma occurs when an individual internalizes stigma tied to as aspect of their identity (Corrigan, 2004), and may cause individuals to feel alone in battling anxiety. Individuals who have greater levels of self-stigma (specifically tied to seeking counseling) were less likely to seek information regarding mental healthcare, possibly because seeking this information highlights mental health challenges which are threatening to the self in this group (Lannin, Vogel, Brenner, Abraham, & Heath, 2016). Thus, if norms describe that others are already seeking treatment, this may be particularly helpful for individuals experiencing stigma and may promote searching for treatment information. Information gained from Study 4 informs whether individuals with anxiety are likely to find group norms about treatment seeking particularly appealing.

The desire to handle mental health problems on one’s own. A final way of framing treatment messages addresses an attitudinal barrier for seeking mental health treatment. *Wanting to handle the problem on one’s own* is a very common attitudinal barrier cited for not seeking professional help for emotional difficulties (Mojtabai et al., 2011; Sareen et al., 2007). Specifically, among individuals who do not access mental health treatment but who recognize a need for treatment, the most common reason for not accessing treatment was wanting to handle the problem on their own (Andrade et al., 2014). There may be a number of important factors contributing to this desire, including stigma tied to seeking care, thinking a professional will not be helpful, or even that seeking care signifies weakness. In the current studies, this broad attitude is explicitly targeted by presenting a statement that counters the belief that the problem needs to be handled on one’s own (e.g., “You don’t have to go through this alone”). Although this is a perceived barrier to seeking treatment, there is no data to suggest that drawing attention to a barrier will be appealing for individuals with anxiety. Therefore, individuals from the focus groups were asked to comment on whether this is an appealing and convincing framing.

This dissertation draws from the five frameworks/factors to create messages to increase interest and engagement in seeking treatment for feelings of anxiety. Although the frames are discussed in this manuscript as mutually exclusive (in an effort to examine whether a particular framework is more or less effective), in reality these frameworks and theories likely interact and overlap. In the current dissertation, these ways of framing messages were chosen either because they have been studied in other domains (e.g., gain- and loss-frameworks in cancer-related behaviors) as successful ways of framing healthcare messages, or because they may add validity to the statement about treatment efficacy (which may address anxious individuals' intolerance of uncertainty, and draws from evidence suggesting credibility of treatment is an important predictor of outcomes). Trust in science/research, messages from trusted organizations, group norms, and explicitly labeling a perceived barrier may have the effect of decreasing uncertainty surrounding seeking treatment and may therefore promote treatment-seeking. However, it is not clear how individuals with anxiety perceive different sources (e.g., broadly citing "research" or suggesting a trusted group endorses a treatment). Focusing on these five frameworks/factors allows for a better understanding of how to effectively frame anxiety treatment messages for promoting seeking treatment. It is noted, however, that this is a "wide angle" approach in that we are testing multiple theories at once. Limitations of this approach are discussed.

Dissertation Overview and Hypotheses

Study 1 was a set of preliminary field experiments that took place on the American Psychological Association's (APA) website that promotes its new Clinical Practice Guidelines for the treatment of posttraumatic stress disorder (PTSD) in adults. In August 2017, the APA launched the site to disseminate information about these guidelines. This was a systematic review of evidence-based treatments for PTSD, and the APA has recently launched a website for clinicians and consumers (patient and families) with information regarding the treatments. Critically, the guidelines suggest CBT is a strongly-recommended intervention (the highest

rating possible) for the treatment of PTSD (American Psychological Association, 2017b). This site outlines the levels of evidence for recommended treatments for PTSD, and then offers information for potential treatment consumers. In an effort to maximize consumer engagement on the website, the APA allowed an experimental manipulation of the subheading text on three web pages. Across the landing/main page, the treatment information page, and the For Patients & Families page, visitors to the site were randomly assigned to see varying subheadings created based on the frameworks/factors outline above. It was hypothesized that these subheadings would be more engaging (as defined by website users' behaviors, such as link clicks and time spent on the site) than the original version of each page that did not include a subheading addressing the factors or frameworks. However, no *a priori* hypotheses were predicted for the relative success of the manipulated subheadings.

Following the results of Study 1, Study 2 was a preregistered conceptual replication to examine whether similar results would emerge in an online web study. Whereas Study 1 participants were presumably invested stakeholders interested in learning more about the information provided by the APA, Study 2 participants were research volunteers randomly assigned to this particular study. Therefore, if results of Study 1 were replicated in Study 2, this would suggest robust effects of subheadings on individuals' attitudes about treatment information.

Study 3 was a qualitative study that consisted of three focus groups. Local community members who were either high in anxiety symptoms or had a family member or close friend with anxiety were invited to discuss their attitudes about anxiety and treatment options and were asked to provide feedback on different persuasive messages regarding evidence-based anxiety treatment. The purpose was to identify themes from discussions regarding knowledge of available treatments for anxiety disorders, attitudes about treatment, and to solicit feedback about the different potential messages regarding evidence-based anxiety treatments.

Finally, Study 4 was a large-scale, online experimental investigation to examine whether there are groups of individuals who respond similarly to particular subheadings, and if so, whether demographic and individual characteristics predict group membership. Age, education, political ideology, anxiety symptom severity, treatment-seeking stigma, race, ethnicity, in addition to other variables were examined as predictors for group membership. Importantly, understanding how groups of individuals respond to various subheadings - and knowing who are in the groups – will allow for more effective promotion of evidence-based treatments for specific groups of people.

The four studies in this dissertation allowed for a multi-method investigation of ways of effectively frame messages regarding evidence-based treatment. The goal of this dissertation is to better understand how to effectively word messages about treatment so that anxious individuals are most likely to seek evidence-based care.

Study 1 Method

Participants and Recruitment

Study 1 is a series of field studies that took place on the APA's new website that provides information on Clinical Practice Guidelines (CPGs) for the Treatment of PTSD in adults. Given that these were field studies completed on a live site, participants are any individuals who view the website. The purpose of the site is to disseminate evidence-based treatment information to practitioners as well as consumers, and many resources on the site are written For Patients & Families. So, it is most likely that the majority of visitors to the site are potential treatment consumers, researchers, and clinicians.

On August 1, 2017, the APA did a press release on the website (American Psychological Association, 2017a) announcing the launch. Following the launch, APA staff did outreach to various groups to promote the site, and news organizations also picked up the story. Thus, right after launch, there were multiple sources promoting the site, so traffic during the experiments was likely unusually high for APA's webpages.

Method

Three experiments have been conducted on the site. See Appendix A for definitions of Google terms and Appendix B for screenshots, lists of experimental manipulations, and definitions of objectives.

Experiment A. The first experiment addresses whether altering subheadings on the home page of the site (http://www.apa.org/ptsd-guideline/index.aspx) increases user engagement on the page. The experiment tested seven variants – created based on the five frameworks and factors listed in the Introduction – and how they differentially affected whether someone clicked on one of the six main boxes (links) on the page, relative to the original webpage without a subheading. Each variant was identical, except for the varying subheadings. The headline from the APA that is consistent across all variants was, "Clinical Practice Guideline for the Treatment of Posttraumatic Stress Disorder (PTSD)." The variants included:

1. Original version of the landing page with no subheading added
2. Find treatment supported by the best available research (trust in scientific experts factor)
3. Find a treatment supported by science (trust in scientific experts factor)
4. Find a treatment endorsed by the APA (organizational support)
5. Find a treatment to help you take back your life (gain-framework focusing on positive outcome to be gained)
6. Find a treatment to help you say goodbye to symptoms (gain-framework focusing on negative symptom to be lost)
7. Join others with PTSD who have found relief in treatment (describing norms factor)
8. You don't have to go through this alone; find a treatment that works (attitudinal barrier to therapy of wanting to handle problems on one's own)

As a first study on the APA website, we opted not to highlight potential negative outcomes of not seeking treatment (loss-focused framework). However, potential subheadings for the next examination could include a direct comparison of gain- and loss-frameworks. The experiment

was created, run, and analyzed using Google Analytics (www.google.com/analytics) and Optimize (for creating experiments; www.google.com/analytics/optimize). All eight pages ran concurrently until the conclusion of the experiment (see Analytic Plan, below). Site visitors were randomly assigned to the different pages at the start of each session. Experiment A launched August 18, 2017 and concluded November 16, 2017.

Google Optimize requires one main objective (outcome) per experiment that is monitored and is used for deciding when to conclude the experiment. The main objective for Experiment 1 is number of clicks on the six blocks (links) to other website content pages of the Guidelines. This was chosen as the main objective because clicking on boxes below the subheading would suggest engagement with the content. Ideally, site visitors would read the title and subheading, and then choose which additional information to browse. The subheadings were predicted to differentially pique interest in the website content. If one subheading performed more poorly than the rest, it could be inferred that the subheading did not enhance interest in reading more site content. Additional metrics that were assessed, but not used as the deciding factor for the experiment, included bounces (single page session on a website, where a user does not engage in any other way on the page; Google, 2017a) and session duration (the amount of time spent on the site during a given session, which is a set of user actions within a given time frame; Google, 2017e). Note that bounces and clicks are highly negatively related in that if an individual clicks on a link on a page, someone has not bounced off of the page (exiting without clicking anywhere). These additional metrics allowed us to examine user behavior on the site to have a better understanding of engagement with material.

No variant was predicted *a priori* to have the highest statistically significant click rate; the main hypothesis for Experiment A was that one of the variants derived from the framework/factor list would emerge as a clear “winner” in terms of the main objective, in that one of the subheadings would lead to the highest click rate on the links to additional pages of the site, and would beat the APA headline that lacked the added messages.

Experiment B. This experiment was conducted similarly to Experiment A, except that it varied the subheadings on the Treatments page of the site (http://www.apa.org/ptsd-guideline/treatments/index.aspx). Experiment B tested seven subheadings (based on four of the five frameworks described above; the organizational support factor was not tested on this page) and the original subheading. Again, all pages ran concurrently and visitors were randomly assigned to a variant. This experiment ran August 23, 2017 to November 21, 2017. The headline that was consistent on this page across the variants was, “PTSD Treatments.” The variants included:

1. Original version of the Treatments page with no subheading
2. Research shows strong support for four interventions for posttraumatic stress disorder, and conditional support for another four (trust in scientific experts factor)
3. Scientists strongly support four interventions for posttraumatic stress disorder, and conditionally support another four (trust in scientific experts factor)
4. Patients can take back their lives (gain-framework focusing on positive outcome to be gained)
5. Patients can say goodbye to symptoms (gain-framework focusing on negative symptom to be lost)
6. Patients don’t have to suffer with posttraumatic stress disorder (gain-framework focusing on negative symptom to be lost)
7. Patients are getting better. Find treatments that work to help you (describing norms factor)
8. Those with PTSD don’t have to suffer alone (attitudinal barrier to therapy of wanting to handle problems on one’s own)

The main objective for Experiment B was clicking any of the links below the introductory text on the page. This was chosen as the primary objective for this experiment because it is predicted that more engaging or interesting subheadings would encourage individuals to learn

more about the recommended treatments. Clicking on the links to lower content (i.e., show more information about the treatments), treatment links, and download information from the site were assumed to reflect interest in learning more about the treatments. Additional objectives measured – but not used for primary outcomes – included bounce and session duration.

Like Experiment A, no one subheading was predicted to increase user engagement on the Treatments page. However, it was predicted that one subheading would be statistically more likely to increase user engagement than the rest, and would be more engaging than the original version of the page.

Experiment C. Experiment C was similar to the previous two experiments, except it altered the subheadings on the For Patients & Families page of the site. Again, seven theoretically-derived subheadings were created from the five frameworks described, and were concurrently tested with the original version of the site. Visitors were again randomly assigned to see the different variants. The experiment ran from August 23, 2017 to November 21, 2017. Note that all three experiments overlapped in time. The main headline that did not vary across the variants was, “For Patients & Families.” The subheadings included:

1. Original version of the For Patients & Families page with no subheading
2. Treatment works: Feel like yourself again (gain-framework focusing on positive outcome to be gained)
3. Treatment works: Say goodbye to symptoms (gain-framework focusing on negative symptom to be lost)
4. Science says, treatment works (trust in scientific experts factor)
5. Research shows, treatment works (trust in scientific experts factor)
6. The APA supports these recommended treatments (organizational support factor)
7. Others are getting better, you can too (describing norms factor)
8. Treatment works: No one has to go through PTSD on their own (attitudinal barrier to therapy of wanting to handle problems on one’s own)

The main objective for Experiment C was clicking on the “Find a Psychologist” button on the right side of the page. This was a particularly stringent test of the efficacy of the subheadings, given this would directly reflect interest in seeking treatment after viewing information on the website. Additional metrics included bounce and session duration.

Like Experiments A and B, no one subheading was predicted to increase clicks to the “Find a Psychologist” button. However, it was predicted that one subheading would be statistically more likely to increase clicks than the rest, and would be more engaging than the original version of the page.

Study 1 Analyses and Results

Google Optimize was used to monitor the experiments as they ran and was used for all data analysis. The content experiments used a multi-armed bandit approach, estimated using Bayesian methods, to model and analyze the data (Scott, 2010, 2017). Twice per day, Google studies which arm (in this case, subheading variant) has the highest conversion rates (i.e., highest rate of visitors completing a defined experiment objective), and then allocates users to the arms differentially based on success the previous day. The more successful the arm, the more users are allocated to that arm. Throughout the experiment, the rate of traffic to each variant is updated twice daily to ensure that the variant most likely to succeed gets the most traffic. (Note that this is especially useful for those businesses that are using Google Analytics for increasing profits, as Google allocates users to the arms that are likely to bring in the best return.) This also allows for more stringent comparisons between the best-performing arms of the experiment. More information about the equation used for determining optimal arm probabilities can be found at https://support.google.com/analytics/answer/2846882.

“Winners” of experiments are determined when the “probability to beat baseline” reaches 95% (Google, 2018). Experiments will run for two weeks minimum, and for a maximum of 3 months (Scott, 2017). Critically, Google Optimize will not declare a “winner” if there is a tie among variants. Two or more arms may perform similarly, so running the experiment until a

single “winner” is chosen is not ideal, given finding a single winner may take a very large number of participants to identify. This multi-armed bandit approach allows researchers to run an experiment until the optimal arm(s) is(are) found, “until you’re sure that switching arms won’t help you very much” (Scott, 2017). Importantly, Google only provides clear results as to how the variants performed against baseline; no post-hoc comparisons of variants can be conducting with the information given from the Bayesian models. Google does provide credibility intervals, however, which are helpful in visually inspecting how the variants compare to each other. Credibility intervals (or credibility regions) are used in Bayesian statistics to provide a range of values for which, given the measured data, “there is a 95% probability that the true value of [your parameter] lies within the credible region,” (VanderPlas, 2014, p. 4). This is philosophically different from a confidence interval in frequentist statistical inference, where “if [the] experiment is repeated many times, in 95% of [the] cases the computed confidence interval will contain the true” value of the parameter (VanderPlas, 2014, p. 4). For a more detailed discussion, see VanderPlas (2014). Credibility intervals can be compared by taking a difference of the intervals, and if the difference range includes 0, then the variants are not statistically significantly different. However, the credibility range differences are calculated from multiple parameters from the models, which are unavailable from Google. So, in the current study, we are not able to statistically determine a difference between variants.

Experiment A Results

Experiment A consisted of 19,731 sessions across seven variants and the original version of the page; the boxes (links) below the headline were clicked a total of 6,290 times. Critically, no single variant was found to be statistically significantly better-performing than the rest in terms of the main objective for Experiment A, using a 95% credible interval around modeled conversion rates. However, the original had the highest raw conversion rate; see Table 1 for results. Although the full model parameters are not available from Google, modeled conversion rates consider “account time, user context, result consistency, and other factors”,

(Google, 2018). Note that it is not clear what these additional parameters are, and Google does not provide more information than this statement. See Appendix C for discussion of attempts at learning more information about Google Optimize models. The models used are likely proprietary, and Google does not disclose all of the information about users it uses to measure conversion rates in experiments. Consequently, dividing the conversions by number of sessions (which is the raw conversion rate) will not be the same value as the modeled conversion rate. Google notes that this modeling approach predicts "how your variants are likely to perform in the future" (Google, 2017c). Bounce rate, see Table 2, had similar results, with no statistically significant difference among variants. However, the subheading "Find a treatment to help you say goodbye to symptoms" had longer session duration compared to the original version of the page, with 98% probability to beat baseline (95% credibility interval = 3:55 to 4:47 seconds compared to the original's 3:22 to 4:07 seconds). See Table 3 for session duration results.

Results of Experiment A suggest that adding a theoretically-derived subheading to the main page of the PTSD Guidelines website does not statistically significantly increase user engagement on the site (as operationalized by clicking on links below the subheading) or decrease bounce rate of the page. However, the subheading targeting loss-framework ("Find a treatment to help you say goodbye to symptoms") was associated with the longest session time on the site.

Experiment B Results

This experiment consisted of 6,255 sessions, with 1,663 clicks to the links on the page (primary objective). None of the variants on the Treatments page were statistically significantly predicted to out-perform the original; see Table 4. However, there was a trend for the subheading "Those with PTSD don't have to suffer alone" to lead to a higher conversion rate than the original. This variant was rated as having a 94% probability of beating the original, which is conceptually similar to a *p* value of .06. Critically, the variant "Patients can take back their lives" was statistically significantly the worst in terms of conversion rate. This was predicted

to outperform the original only 1% of the time. Bounce rate (Table 5) and session duration (Table 6) did not significantly vary depending on variant.

Results of Experiment B suggest that varying text below the headline on the Treatments page does not improve engagement (i.e., clicking on links to learn more about treatments, bounce rate, or session duration). There was a trend for the subheading addressing not having to go through PTSD alone outperforming no subheading, suggesting that individuals seeking treatment may be more engaged to seek treatment information if they feel less alone in the process. In addition, the variant addressing a gain framework (of patients taking back their lives) seems to be particularly aversive when considering seeking treatment information, which will be an important result to study in future examinations.

Experiment C Results

Experiment C consisted of 2,843 total sessions, and only 34 clicks on the "Find a Psychologist" button on the For Patients & Families page. Although one clear "winner" was not declared for this Experiment, two variants emerged as being more likely to lead to clicks on the "Find a Psychologist" button (primary objective) than the original. Both variants "Treatment works: Feel like yourself again" and "Treatment works: Say goodbye to symptoms" were statistically significantly predicted to outperform the original. The gain-framework subheading (feel like yourself again) had a 96% chance of outperforming the original (similar to $p = .04$), and another gain-framework subheading (say goodbye to symptoms) had a 97% chance of outperforming the original (similar to a $p = .03$). The statistical model predicted that the "goodbye to symptoms" variant had a 42% chance of being the "best" variant of the eight options; see Table 7. This variant also had the lowest bounce rate, with a 100% chance of outperforming the original version of the page; see Table 8. The variants "Science says, treatment works" and "Others are getting better, you can too" were also predicted to outperform the original 100% of the time. Out of all of the variants, the "say goodbye to symptoms" variant had a 60% chance to have the lowest bounce rate. The three variants that performed well in

terms of bounce rate also performed well in terms of session duration. The gain-framework variant (say goodbye to symptoms) was predicted to be the “best” variant at 45% (which was the highest predicted rate), and had a 99% chance of outperforming the original. Similarly, “Science says…” and “Others are getting better…” variants also had a 99% chance of outperforming the original, but had a lower predicted success rate of outperforming all other variants than the loss-framework variant; see Table 9.

Overall, the gain-framework variant “Treatment works: Say goodbye to symptoms” was the clear “winner” by all three metrics on the Patients and Families page, based on Google’s models.

Study 1 Discussion

Across three field studies, changes to subheadings on the main landing page and treatment description page did not result in changes to users’ behavior; however, changes to subheadings on a page written for potential consumers of evidence-based PTSD treatments led to change in user behavior. When website users saw “Treatment works: Say goodbye to symptoms” on the Patients and Families page of the APA clinical practice guideline website, they clicked more frequently on the “Find a psychologist” link (though the total number of clicks on this link was small), stayed on the page longer, and left the page without clicking on content the fewest times. All three indicators suggest that site visitors seeing this headline were more engaged and interested in learning about evidence-based treatments for PTSD. These results could also suggest specificity of effects depending on the targeted audience; the headlines were written to target potential treatment consumers and their loved ones, and this page was the only one that showed differences based on changes in subheadings. Although speculative, this may also suggest that potential treatment consumers may have focused their attention to the page written expressly for that audience.

These results leave many unanswered questions, not the least of which is whether the results of this field study - using a novel (for our field) design – will replicate. In July 2019 (two

years after the launch of the site), APA was contacted to inquire whether a direct replication of the For Patients & Families page experiment was possible on the live website. Although APA was willing to allow us to run the experiment, site traffic had drastically decreased since site launch to the point where an experiment would not have been adequately powered. So instead, we ran a conceptual replication to examine whether the effect of subheading on website user engagement could be replicated in a different sample and setting. In this study, subheadings were randomly assigned to research volunteers in an online laboratory setting. Replicated results would suggest a very robust effect of "Treatment works: Say goodbye to symptoms" as an effective, yet simple, framework to promote evidence-based treatments in diverse samples.

Study 2 Rationale

We opted to run a conceptual replication of the field study using an online research platform. Although the field study allowed for strong external validity of the potential effects of subheadings on website behavior, we were unable to characterize the sample, control number of times individuals saw the content, or directly evaluate different aspects of participants' reactions to the website material. In the replication, the experience mimicked what site visitors would experience on the Patients and Families page in a relatively more controlled online setting.

Study 2 Methods

Participants

Participants for Study 2 were recruited from Project Implicit (https://implicit.harvard.edu/implicit/), which is a research website with a registered participant base. Volunteers participate in rotating studies examining implicit attitudes. Participants qualified for this study if they were: 1) 18-years-old or older, and 2) U.S. citizens or residents (to reduce the influence of cross-national differences tied to health care systems and treatment access in this initial investigation). We elected not to screen based on mental health symptoms or treatment need given that messages directed to patients and their families would be relevant to

a broad range of the general public, and this sampling approach also increased feasibility of recruiting the large sample required.

The study ran from August 16 to 24, 2019; 844 individuals were assigned to this study from the rotating pool of available studies. Of those, 771 consented to the study. Following informed consent, participants were randomly assigned to one of five headline conditions (see Materials, below) to replicate the live APA PTSD webpage results; 578 individuals completed ratings for the subheadlines. Of those, 453 completed the study and saw the debriefing form. For the analyses presented here, the 578 individuals who completed the ratings were included in analyses, although note that some individuals declined to answer some of the ratings ("decline to answer" is always an option) and some individuals did not complete the questionnaires following the ratings, so samples for analyses do not always equal 578. Participants were ages 18- to 86-years-old (M = 38.53, SD = 14.74). Four hundred twenty-nine identified as women, and 147 identified as men (the web platform did not include options to reflect gender diversity, hence the results are reported only for men and women). Race was reported as 62 (10.7%) Black or African American, 414 (71.6%) White or European American, 22 (3.8%) Asian, 35 (9.8%) as more than one race, and 39 (6.7%) reported race as other or unknown. Sixty-four (11.1%) reported their ethnicity as Hispanic; 466 (80.6%) reported not Hispanic;;48 (8.3%) either reported unknown or did not report. This was a well-educated sample: 219 (37.9) reported having an advanced degree, 198 (34.3%) had at least a bachelor's degree, 126 (21.8%) had at least some college or an associate's degree, 26 (4.5%) had at least a high school degree, and 6 (1.0%) had less than a high school degree.

Twenty-six (4.5%) reported that they were currently struggling with PTSD; 29 (5.0%) reported struggling with PTSD in the past. Although the majority of individuals reported not knowing anyone with PTSD (n = 257, 44.5%), 127 (22.0%) reported knowing someone with the disorder, with the remaining individuals either unsure of whether they know someone or not answering the question.

Materials

Demographic variables. When registering for Project Implicit, participants are asked to report their demographic information.

Subheading rating task. In this task, participants were instructed: “In this task, we are interested in your opinion on a real webpage. [On the next page] you will see a webpage from the American Psychological Association. Take as little or as much time as you would like examining the page and its content. When you are finished… you will be prompted with questions about your opinion of the webpage. There are no right or wrong answers. We are simply interested in your thoughts about the page and its contents.” Participants then saw a screenshot of the For Patients & Families page of the guideline with one of five randomly assigned subheadlines: 1) no subheadline; 2) Treatment works: Say goodbye to symptoms; 3) Treatment works: Feel like yourself again; 4) Others are getting better, you can too; 5) Studies show treatment works. Subheadings 2 and 3 were selected because, in Study 1, these were the two subheadings that significantly increased clicking on the “Find a Psychologist” button over no subheadline. Subheadings 4 and 5 were selected based on focus groups (see Study 3, below) with adults with anxiety to identify effective language for increasing interest in evidence-based treatments among potential consumers. Time spent on the page was measured.

On the following page, participants were presented with questions about the version of the For Patients & Families page that they saw. Questions were presented one at a time in a random order: “How engaging was the content of the webpage you just saw?” (1 = *not at all engaging*, 5 = *extremely engaging*); “How helpful was the content of the webpage you just saw?” (1 = *not at all helpful*, 5 = *extremely helpful*); “How trustworthy was the content of the webpage you just saw?” (1 = *not at all trustworthy*, 5 = *extremely trustworthy*); “If you were struggling with posttraumatic stress disorder (PTSD), how likely would you be to click the “Find a Psychologist” button on the righthand side of the page?” (1 = *not at all likely*, 5 = *extremely likely,* or *I did not see that button*); “If a family member or friend were struggling with PTSD, how

likely would you be to recommend the webpage you just saw?" (1 = *not at all likely*, 5 = *extremely likely*). The final question was always: "If you would like to receive an email from the study investigator with more information about recommended treatments for PTSD and a link to the live webpage, please enter your email address below." Owing to the format, participants could not click on the "Find a Psychologist" button during the study, so there was no direct parallel in the replication study. Asking for email addresses served as a proxy for a behavior that would be seen as high-investment/engagement (submitting personally identifiable information for more information on the treatments).

Mental health history and proximity to PTSD. Participants were asked to indicate whether they are currently struggling or have previously struggled with PTSD. They were also asked to indicate whether they know someone with PTSD (a family member, a close friend, someone else close, or all of the above).

Procedure

Following informed consent, participants were randomly assigned to one of the five subheading conditions and were then asked to rate their version of the For Patients & Families page. Participants then completed the mental health history items. Finally, participants were given the opportunity to read more about the research in the debriefing form. (Additional measures were collected during the study that are not central to the current questions, including a brief Implicit Association Test [BIAT; Sriram & Greenwald, 2009] assessing self + traumatized implicit association strength.)

Study 2 Results

Hypotheses were preregistered on August 26, 2019, prior to data analyses (see https://osf.io/rha53). As outlined in the preregistration, six one-way ANOVAs were conducted to examine whether the five subheading variants differed in the six ratings. Follow up multiple comparisons using a Bonferonni correction were planned for significant omnibus tests. A chi-squared test was used to examine whether seeing a specific subheading was more or less likely

to encourage someone to enter their email address for more information. To correct for multiple comparisons, alpha was set to .007 (.05 / 7 tests). All ratings (how engaging, helpful, and trustworthy, whether someone would click “Find a Psychologist,” and likelihood of referring a friend) were on a Likert-type scale and were normally distributed. Four extreme outliers on the time spent on the For Patients & Families page were removed (ranging from 34.40 minutes to 26.17 hours); the rest of the participants viewed the page for 1.21 seconds to 9.87 minutes. However, the viewing time variable was positively skewed, so a log transformation was used to normalize this variable.

Between 129 and 149 individuals were randomly assigned to see each subheading variation; a chi-square analysis revealed that participants did not leave the study during this task at different rates depending on the subheading, $\chi^2(4) = 1.53$, $p = .822$ (ranging from 17 to 25 individuals dropping out per subheading). Across all dependent variables, no differences across subheadings emerged (in contrast to results for the field study on the APA website). A one-way ANOVA testing whether individuals spent varying amounts of time on the site by subheading revealed no significant differences, $F(4, 569) = 1.66$, $p = .157$. Subheadings did not receive reliably different ratings for engagement ($F[4, 562] = .73$, $p = .550$), helpfulness ($F[4, 560] = .65$, $p = .626$), or trustworthiness ($F[4, 547] = 1.30$, $p = .269$). Further, individuals did not significantly vary in their self-reported likelihood of clicking the “Find a Psychologist” button ($F[4, 505] = .51$, $p = .726$) or referring friends/family to the site ($F[4, 561] = .58$, $p = .678$). A chi-square test revealed that participants were not more or less likely to enter their email address for more information depending on subheading, $\chi^2(4) = 1.83$, $p = .766$ ($n = 26$ giving their email address requesting more information).

Studies 1 and 2 Interim Discussion

Taken together, the results of the first two studies of this dissertation are mixed. On the one hand, promising results from the field study suggest that minimal changes to text on a website can potentially affect website visitors’ behavior while interacting with a webpage. In

particular, visitors to the APA Clinical Practice Guideline for the treatment of PTSD For Patients & Families webpage did vary their behavior based on subheadings. Although site visitors clicked on the “Find a Psychologist” button relatively few times overall, they did click statistically more frequently on the button and were more likely to engage with site content when presented with the subheading “Treatment works: Say goodbye to symptoms,” relative to no subheading. This suggests that a no-cost “intervention” (changing text on a web page) may help engage individuals in seeking more information about evidence-based treatments and perhaps even influence treatment-seeking behaviors. However, Study 1 results did not replicate in a controlled experiment with the Project Implicit sample.

Study 3 Method

Participants and Recruitment

Participants were recruited from the local community via posted flyers and online advertisements on Craigslist.org and Nextdoor.com in the fall of 2018; see Appendix D. Recruitment materials advertised a “Study on Attitudes about Anxiety Treatment.” Individuals qualified for Study 3 if they were: 1) 18-years-old or older, 2) U.S. citizens or permanent residents (because participants must have a social security number to receive payment from government grants), 3) score 8 or greater (mild to extremely severe ranges) on the Depression, Anxiety, and Stress-Anxiety subscale (DASS-A; Lovibond & Lovibond, 1995; see Appendix E), OR had a family member or close friend with a self-reported anxiety disorder. Participants were compensated $25 each.

Twenty-five individuals completed the screening questionnaire, see Appendix F. Five reported knowing someone whose anxiety interfered in their day-to-day life, while 18 reported struggling with anxiety themselves (though two individuals who endorsed struggling with anxiety did not qualify to participate based on DASS-A scores). Two reported struggling with anxiety and knowing someone with anxiety. The individuals who reported both being anxious and knowing someone with anxiety were invited to participate in the group with individuals struggling

with anxiety given they were eligible for participation based on their DASS-A scores. Individuals eligible to participate were invited to complete a scheduling poll to join a group.

The first focus group occurred on November 25, 2018. Six individuals struggling with anxiety indicated that they were available; four individuals presented for participation (*M* = 30.75 years old, *SD* = 6.24 years, range = 24- to 39-years-old, 2 women, 2 men). Two participants reported having a bachelor's degree, one having an associate's degree, and one having completed some college. Three individuals reported their race as White; one reported race as both African American/Black and White. Three reported ethnicity as not Hispanic/Latinx; one reported ethnicity as Hispanic/Latinx. Two reported their income as less than $25,000; two reported their income as between $75,000-$149,999. DASS-A anxiety scores ranged from moderate (scores of 10, 10, and 14) to extremely severe (score of 28), with a mean rating of 15.50 (*SD* = 8.54).

The second focus group occurred on November 27, 2018. Five individuals with a family member or friend with anxiety interfering with day-to-day life indicated they were available; three individuals presented for participation (*M* = 40.67 years old, *SD* = 20.81 years, range = 24- to 64-years-old, all women). All reported having a master's degree. Two reported their income as between $75,000-$149,999; one reported income as between $25,000-$49,999. All reported their race as White and ethnicity as not Hispanic/Latinx. All reported that a family member's anxiety was "interfering with the person's life;" one reported that their family member's anxiety was also "inappropriate or unnecessary" and "severe… and frequently anxious." Family members with anxiety were a husband, a sister, and a mother.

A third focus group was conducted for additional data, given the low turnout for the first two. This group was conducted December 3, 2018. Five individuals struggling with anxiety indicated that they were available; four individuals presented for participation (*M* = 32.50 years old, *SD* = 15.15 years, range = 20- to 52-years-old, all women). Two reported having some college education, one had a bachelor's degree, and one had a doctorate. All reported ethnicity

as not Hispanic/Latinx. One reported race as American Indian/Alaska Native, Black/African American, and White. The other three reported race as White. One reported income below $25,000, two as between $50,000-$74,999, and one as greater than $150,000. DASS-A anxiety scores ranged from moderate (two scores of 10) to extremely severe (scores of 24 and 34), with a mean rating of 19.50 (*SD* = 11.70).

Materials

Qualification survey. See Appendix F for items created for this study to determine eligibility for the focus groups. Individuals answered whether they experience symptoms of anxiety and/or know someone experiencing symptoms of anxiety. Demographic questions were also included.

Depression, Anxiety, and Stress-Anxiety subscale (DASS-A; Lovibond & Lovibond, 1995; see Appendix E). This seven-item scale assesses physiological arousal and subjective distress associated with symptoms of anxiety. Individuals with anxiety disorders score significantly higher on this scale than non-clinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998). Internal consistency for the full DASS-21 scale is adequate across different racial groups, and across these groups, item loadings were invariant to their respective scales (Norton, 2007), suggesting that the subscale items represent similar symptoms across racial groups.

Cognitive behavioral therapy (CBT) description and sample headlines handout. A handout was created for the focus groups to allow participants to read a description of CBT and sample headings to facilitate discussion. The purpose of the focus groups was to elicit feedback on previously generated headlines and workshop/brainstorm ideas for new headlines. Headlines were similar to those included in Study 1, with some additions. See Appendix G.

Procedure

Following recruitment, participants who emailed the primary investigator were given a link to the qualification survey. Those who qualified were invited to complete a poll to identify

availability for participation. Focus groups were scheduled based on the availability of the majority of eligible individuals. Focus groups were conducted by the author; a research assistant and clinical graduate student assisted with the groups. Focus groups were video recorded once participants signed the informed consent and materials release forms. Approximately half of the group discussion time focused on a conversation about CBT generally (including any experience with the treatment); the second half was focused on reactions to the sample headlines (Appendix G). When given the handout, participants were asked for their general feedback on the headlines. Different groups spent different amounts of time on each headline; some headlines did not elicit any comments from participants, while some were extensively discussed. The author also directly asked for feedback on some headlines during the discussions. Participants were fully debriefed at the end of the discussion. The audio portion of the recordings were sent to an external transcription service for initial transcription. Two research assistants assisted the author with checking the transcriptions for accuracy and removal of identifying information (each transcription was checked twice).

Study 3 Results

The discussions concerning the sample headlines were the focus for Study 3 analyses. Although participants offered interesting insights on their attitudes about CBT and how their experiences with treatment shaped these attitudes, those discussions are not reported here. Within the context of this dissertation, results focus on discussions of reactions to specific subheadings, given a goal was to create headlines for Study 4.

Although qualitative analytic approaches typically involve multiple coders of the data (e.g., Griffith, Hurd, & Hussain, 2017), for this dissertation, the author opted to sort reactions independently. To examine reactions to the provided headlines, comments were categorized by relevance to each sample headline. To do this, the author watched each of the focus group discussions while reading the transcripts to get familiarized with the data. Next, the transcripts were read with the purpose of identifying when participants discussed any of the headlines (i.e.,

each comment was categorized into a document by headline, so that all comments regarding a specific headline could be read together). If a comment was made about multiple headlines, the comment was included with each of the headlines discussed. Comments had to be clearly remarking on one of the headlines (e.g., participant either indicated the number next to the headline or read the headline out loud). Headlines were clearly indicated so no additional coding assistance was needed.

Given that the participants could react to any of the headlines in any order, and given that the author elicited feedback on specific headlines, analyzing feedback by *extent* of conversation (i.e., words said with regard to each headline or time spent discussing) would not necessarily be meaningful or useful units of analysis. Instead, comments were examined with the goal of creating headlines for Study 4. Thus, reactions to the headlines will be presented here with regard to valence (i.e., positive comments, negative comments, or mixed) and attitudes about the headlines and/or suggestions. The author independently interpreted the comments. Both types of focus groups (individuals with anxiety and individuals with family members with anxiety) were collapsed for these descriptions.

General Feedback

Participants suggested not using acronyms in the headlines, given not everyone will know what “CBT” or “APA” stands for. Study 4 headlines will spell out acronyms where appropriate. However, for brevity in this document, headlines below will be discussed using the acronyms.

Results by Headline

CBT works. Two participants in different focus groups reacted to this headline. One reported that she really liked this headline because it would appeal to her and her friends; she reported that she likes this headline because “it’s like this cool thing where you can understand your mind more... I could see myself seeking out CBT without having anxiety. I could see myself seeking it out for another issue. I don’t know, I think like, CBT works.” The other participant

reported a negative reaction to the headline: “like CBT works, you know, to do what? So, that one really bothers me.” This comment would suggest that adding *what* CBT works for may be convincing for this second individual. The ambiguity of “CBT works” may be off-putting for individuals with anxiety, who may be averse to ambiguity generally. However, adding this information to the beginning of other headlines may be a clear, concise message that is appealing and can be addressed in Study 4.

CBT works: Feel like yourself again. Two individuals in different focus groups reacted negatively to this headline, and reactions were intense. One woman reported, “I feel like, I mean, I have been dealing with anxiety since I was probably five. I was the worst, the most anxious kid growing up, teenage years, terrible. College years, terrible. My adult life is terrible*. I don’t know what it is to feel like myself, you know*. So, that one’s kind of a strange one to me” (emphasis added). Another participant in the friends and family group reported, “if you’ve lived with anxiety for a long time, to feel like yourself is anxious.” Another participant in that group agreed with that statement. These reactions were unexpected, however the insight allows us to understand *why* this headline may not gain traction in experimental investigations on live sites, like in Study 1. Thus, allusions to *life before anxiety* will be avoided for Study 4, given individuals may not be able to remember a time before feeling anxious, or have felt anxious their entire lives and wish to feel completely different from how they have always felt.

CBT works: Say goodbye to symptoms. / Say goodbye to anxiety symptoms. At least two individuals reported positive reactions to these headlines. One individual described their line of thinking: “That one resonates with me. That’s the one that would catch my eye, because we know people that have anxiety know they have symptoms. They know that word and they can identify their symptoms. And to be rid of them. I think that’s a really good one right there.” In the first focus group, one of these headlines was described (along with other headlines) as appealing to emotion. The reactions to this headline were neutral among individuals in this group, and this started a conversation about the difference between “science-

based" and "emotions" in advertising (with the suggestion that there is a difference). One other participant had a neutral comment about these headlines. Given the positive comments and the success of a version of these headlines in Study 1, it will be important to examine whether a version of this headline performs well in Study 4 (and to examine to whom does this appeal).

CBT works: No one has to go through anxiety alone. At least three individuals in two focus groups reported positive reactions to this headline. In two focus groups, participants reported that this headline portrayed feelings of empathy. Moreover, this directly addresses the common barrier of wanting to handle problems on one's own (Andrade et al., 2014). As one participant noted: "I think it addresses one of the big barriers to therapy in my mind, which is a lot of people feeling like, yeah whatever problems I have, I should be taking care of those problems by myself… It's empathetic and it is conveying the message like, yeah, you don't have to struggle on your own. So, I find it a lot more compelling compared to the other ones." Another participant reported that "It feels friendly to me, feels like somebody cares." It is important to consider whether addressing this barrier is important to everyone, or if it only appeals to specific groups of individuals. Thus, Study 4 will allow for a more nuanced understanding of this headline's appeal.

You don't have to struggle with anxiety on your own. This headline was not brought up for discussion specifically in any of the focus groups by participants, and the facilitators did not bring it up for comment. However, it is very similar to the comment above, so it is likely that participants did not want to be redundant in responding to headlines. However, it is important that participants responded to the one that included "CBT works," suggesting that it is an appealing statement within headlines. A comparison between headlines with and without "CBT works" in Study 4 could provide additional evidence for whether this statement is useful in promoting the treatment.

Science says, CBT works / Research shows, CBT works. In two focus groups, two individuals had positive responses to these headlines, while three individuals had negative

responses. One participant reported that she did not want to feel anxious, “So if I see the best research and evidence that something is working, I’d probably want to do it… Even though I don’t really agree with CBT.” Another positive comment included: “I want to know that, you know, it’s been scientifically researched. Yeah, I just want that evidence-based there, me personally.” However, others reported that they did not like the appeal to science or research; “I think it’s too vague… I don’t know, like Scientology is technically science but I don’t think it like pinpoints what you are getting at, that it’s like evidence-based reviewed throughout the world in both like clinical settings and probably outside environment settings. I feel like it could be lost very quickly.” Another participant reported that these headlines felt “mainstream” in that it suggests “I know we want, we want to sell, we want to market, we want to make money. It just seems too, I don’t know, too fake. It feels fake.” Participants in one focus group suggested using the word “studies” instead of “research” or “science.” She noted that the word “research” could suggest being funded by “special interests” and then would not be “objective.” However, to her, “study could be just somebody out there interviewing X number of people and doing a study on that… it feels like a more trustworthy word to me.” In the case of such mixed reactions to science and research, Study 4 will be especially helpful for understanding whether there are differences between individuals in their preference for drawing on science. Understanding the appeal for science-based claims would allow for potentially more targeted advertising (e.g., it may be the case that individuals with more education react positively to appeals to science, compared to those with less education).

The American Psychological Association recommends CBT. This headline was discussed in two focus groups. Three individuals felt positively about the headline, while one individual provided a useful critique: “unless you have insider knowledge” about what the APA is, it may not be a convincing statement about the treatment. However, for those who did know what the APA is, they thought this was a strong selling point for CBT. One participant – with a background in psychology – reported, “I love the American Psychological Association. I love the

work they do so I have a bias towards it… It's like a large nationally funded institute that has my interests at heart… If they are recommending CBT, I like it." Another participant said that the APA is a "credible" organization, so would believe this headline. One suggestion for a headline was to indicate whether the APA endorsed CBT above other types of treatment, as that would also "be even more convincing." This comment was interesting since it also suggested that ambiguity in a statement of endorsement (not indicating if the APA endorsed CBT as the *strongest* type of therapy for anxiety) made it less appealing. Including a headline similar to this in Study 4 will allow us to see if a wider audience appreciates this headline.

Others are getting better with CBT. You can too. In one focus group, three individuals reported liking this headline. There was no negative feedback. One said that it would have a "bandwagon" effect, and another indicated that it "takes away the stigma" of seeking treatment. This individual went on to say "first and foremost, we place [stigma] on ourselves. And to take that first step [into therapy] is ridiculously difficult," suggesting that this headline in particular has the potential to overcome the barrier of stigma associated with therapy. By indicating that others are participating in CBT, it makes the treatment somewhat less threatening. Given the positive reactions, it will be useful to include a version in Study 4 to examine whether different groups of individuals react in different ways to this headline.

Others with anxiety have gotten better with CBT. This headline was not brought up for discussion in any of the focus groups by participants, and the facilitators did not bring it up for comment. This headline was very similar to the headline above, with the difference of tense and this headline did not include the positive message, "You can too." The lack of discussion of this headline could be interpreted as the headline was redundant to the headline "Others are getting better with CBT. You can too" and therefore a discussion on this headline would have been repetitive, or it could have been then case that it did not evoke strongly valenced reactions in either direction. Given that this headline did not evoke any positive reactions (and that a similar one did), it will be important not to include headlines that are too redundant in Study 4.

Without CBT, you're still anxious. / Without CBT, you're still worrying. Participants reacted to these two headlines together. Four participants across the two groups with individuals with anxiety had strong negative reactions to these headlines. One individual said, "I personally hate [these two]… It just makes me want to say 'F you!'" Another participant responded to the other participant's comment by saying that the headline is trying to "force" someone to do CBT and that it is not a true statement. Another reported that the headlines are "almost threatening… It's like if you don't do this, you're going to be struggling forever," and that "negative messaging" is not helpful for promoting anxiety treatment. These headlines were drawn from a loss-framework to provide for a comparison to the gain-framework headlines. However, given the strong negative reaction to these, Study 4 headlines will not draw from a loss-framework (i.e., will not highlight the negative consequences of not engaging in CBT).

People who don't get CBT don't get better. One participant felt that this would be an effective headline; two participants had negative reactions. The one who indicated that this would potentially get attention said, "It's not like rationally consistent with reality, but if you're down in the dumps, that might be something you'd like to hear. Because you just want – you don't want to think about it, you hate thinking about it. You just want someone to come to you with a solution, with a magic solution." However, another participant indicated that this headline sounded like a "threat," and another responded affirmingly. Again, this headline was created based on a loss-framework. The purpose of creating appealing headlines for treatment is not to suggest coercion, so this framework will not be pursued further in Study 4.

Over half of people who get CBT get better. This headline was discussed in each of the three focus groups. One individual had a positive comment; three had negative comments. In one focus group, some participants reported liking this as a "talking point," but "not as a marketing tool." Multiple participants did not like this headline because it highlights that potentially half of the individuals who try CBT will not get better. One reported that this headline is "too scientific, too evidence-based" and that "scientists are the wrong people to come up with

things like this" because science is not necessarily appealing. This participant continued to say that "a marketer" may be more comfortable inflating the statistic to make it "seem bigger than it is" as compared to a scientist who is reporting the actual statistic. However another responded with, "But then it's just misleading," which highlights the tension between being precise with statistics in advertising versus bending the truth to promote CBT. These comments suggest that considering other ways of describing the efficacy of CBT will be important to advertising (i.e., describing the number of individuals helped versus rate of success), and will be examined in Study 4.

CBT may help with anxiety more than medication. Six individuals felt positively about this headline; however, one of those individuals suggested changing "may" to "can" because the current version is "unsure." A few participants reported liking this headline because they did not want to take medication (either at all or as a first attempt at treatment) or be on medication for a long time. One participant went so far as saying, "one thing that 'big pharma' has against them in terms of medication is the side effects ad how long-term they're going to kill you." Others listed side effects, such as weight gain and suicidal ideation. The clear comparison to an alternative treatment seemed compelling to some participants, however the purpose of creating headlines to promote CBT in the current study is not to push individuals to feel like they should choose either CBT or medication. After careful consideration, this headline was not chosen to be further examined in Study 4 because it is not entirely clear that if this headline emerges as a compelling marketing strategy it should be used in this context.

Study 3 Emergent Themes and Discussion

Avoid negative messages. Overall, participants did not like the headlines that highlight what happens if an anxious individual does *not* seek CBT. They reported that headline should not be negative, and did not agree with the headlines that suggested that CBT was the only treatment that would lead to decreases in feelings of anxiety. This is an important take-home point, given that these headlines were included in the focus groups because they were

examples to counter the gain-framework messages. These loss-framework messages, highlighting the negative outcomes of not engaging in a particular health behavior were strongly disliked by participants. As noted in the introduction, when tasks have to do with framing losses or gains of monetary rewards, individuals with heightened trait anxiety are more attentive to losses (Hartley & Phelps, 2012). While losses may be motivating in some contexts, it seems that in the present study, participants did not find these particular messages motivating. At least one individual also pointed out – correctly – that this statement is not true (given CBT is not the only way to treat anxiety). Participants wanted the headlines to be honest, and did not feel that the two loss-framework headlines accurately portrayed the state of treatment for anxiety. Although many clinical psychologists would agree that CBT is the gold-standard, participants did not want that to be sold as the *only* option for symptom relief.

Avoid ambiguity. Participants also did not like headlines that were vague (e.g., "CBT works" was not clear in what it "works" for). It is not surprising that participants reporting feelings of anxiety did not like somewhat ambiguous marketing techniques; individuals with anxiety tend to dislike ambiguity. Intolerance of uncertainty is characterized by discomfort with ambiguous situations and scenarios, and is a transdiagnostic construct for many emotional disorders, including social anxiety disorder, panic disorder, generalized anxiety disorder, and post-traumatic stress disorder (see McEvoy, Carleton, Correa, Shankman, & Shihata, 2019 for review). A common treatment component of CBT is to help individuals with anxiety learn to become more comfortable with tolerating feelings of uncertainty. Thus, the discomfort with headlines that are not entirely clear is understandable. An illustrative example during a focus group was when a participant noted, "like CBT works, you know, to do what? So, that one really bothers me." By not indicating what CBT is helpful for, the headline was eliciting more questions of efficacy, rather than persuading the individual to consider this as a treatment option.

Know your audience. A common suggestion from participants was to better understand *who* you are trying to market the treatment to. One of the most memorable comments from the

focus groups was, “I think it would help to know who is who is reading it. Like if you’re going to appeal to men, like a hot therapist chick is one way, like a big truck could be another one.” Obviously the next step in this project is not to make therapy seem sexy, but the broader point of better understanding *for whom* do these headlines appeal to is critical. Among the small number of focus group participants in Study 3, there were very diverse viewpoints on the use of “science” and “research,” as well as whether the APA should be referenced. The comments highlight the need for understanding how to segment the potential market. Focus group participants suggested that headlines should be written with specific groups in mind; this provides support for why Study 4 is a critical next step in this project.

Study 4 Method

Participants and Recruitment

Participants for Study 4 were recruited from Project Implicit (https://implicit.harvard.edu/implicit/). Project Implicit is a research website with a registered participant base; volunteers participate in rotating studies examining implicit attitudes. Participants were qualified for Study 4 if they were: 1) 18-years-old or older, and 2) U.S. citizens (to reduce the influence of cross-cultural differences in this initial investigation). This was a general public sample to maximize external validity and diversity, and ensure feasibility of recruiting the large sample required. Also, given the 12-month prevalence rate of anxiety disorders is 18% (Kessler, Chiu, Demler, & Walters, 2005) and approximately one quarter of individuals in the U.S. will have an anxiety disorder in their lifetime (Kessler, Berglund, et al., 2005), everyone likely knows someone with anxiety or is experiencing anxiety themselves, making the materials relevant to large majority of participants. Participants at Project Implicit are volunteers and did not receive compensation.

The study ran from May 10-24, 2019; 1157 individuals saw the consent form. Of those, 923 consented to the study and 525 were debriefed (398 individuals dropped out of the study at various points). Reported age for the full sample was 16- to 114-years-old. Twenty-one

individuals under 18-years-old and the two individuals reporting their age as 114 years were removed (given it is extremely unlikely that this was their actual age). Given the central question for Study 4 was how participants reacted to potential headlines promoting CBT, only those individuals who completed the headline attitudes questionnaire were retained in the present analyses (N = 582). The final sample ranged in age from 18- to 87-years-old (M = 39.42, SD = 14.07). Although citizenship was limited to US citizenship, 6 (1.2%) individuals reported residence in another country. See Table 10 for demographic information and Table 11 for mental health history, treatment history, and attitudes about treatment.

Materials

Demographics and individual differences.

Demographics and mental health history. This included items assessing: age, race, gender, ethnicity, education, and political attitudes. When used as a continuous variable, education is coded as: having less than a high school degree (1), completing high school (2), completing some college (3), completing a Bachelor's degree or some graduate school (4), or having an advanced degree (5). We also asked about mental health treatment experience to assess potential prior use of CBT and ask about close family members or friends with anxiety difficulties. See Appendix H for questions.

Participants were coded as having a current (or previous) anxiety disorder by binning positive responses to Generalized Anxiety Disorder, Obsessive Compulsive Disorder, Panic Disorder, Agoraphobia, Posttraumatic Stress Disorder, Social Anxiety, or Specific phobia. If a participant wrote in an "other" response indicating some type of anxiety, they were also included as having (or having had) an anxiety disorder.

Attitudes about seeking psychological help. The Attitudes Towards Seeking Professional Psychological Help: Short Form (ATSPPH; Fischer & Farina, 1995) is a 10-item measure that assesses individuals' explicit attitudes about seeking psychological help. In a college student sample, the questionnaire had a .80 correlation for test-retest reliability (Fischer

& Farina, 1995). In the current sample, Cronbach's alpha = .80. The scale is scored by taking a sum of the 10 items (after reverse-coding some of the items). In the current study, the total was derived by taking the mean of an individuals' responses and multiplying by 10, in case an individual skipped any items. See Appendix I for questions. Greater scores reflect more positive attitudes about seeking psychological help.

Mental health symptoms. The Patient Health Questionnaire-4 (PHQ-4; Kroenke, Spitzer, Williams, & Löwe, 2009) is a frequently-used ultra-brief mental health questionnaire used to assess symptoms of anxiety and depression. From the four items, three scores can be calculated: general psychological distress (sum of all items), anxiety subscale (sum of two anxiety items), and depression subscale (sum of depression items). A score of 3 or greater on either the anxiety or depression subscales is an appropriate cut-off point for detecting an anxiety or depressive disorder, respectively (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). The Cronbach's alpha in the current study for all four items was .87. See Appendix J for items.

***Familiarity with and attitude toward cognitive behavioral therapy*.** This two-item measure was created for the current study. A brief description of CBT was provided and then participants responded to the question, "Have you ever participated in CBT with a mental health provider (like a therapist, psychiatrist, or social worker) for anxiety or any other mental health difficulty?" Responses included: *Yes, and it was similar to the description above; Yes, but it was different from the description above; No; I don't know*. Next, participants answered the question, "Based on your prior experiences, the experiences of others, and/or any information that you have about CBT, what is your current attitude about CBT?" Responses ranged from *extremely negative* (1) to *extremely positive* (7).

Self-as-anxious explicit association. Participants were asked to rate how strongly they associated themselves with being anxious or calm. Responses ranged from *extremely calm* (1) to *extremely anxious* (9). This item was included to account for subjective identity as someone

who is anxious. Although we also included a symptom measure in the PHQ-4, self-reported symptoms do not necessarily capture whether someone identifies as being anxious.

Message manipulations. This was a within-subjects design to assess preferences for framing information about CBT. Participants first rated the appeal of a mock website describing CBT without a subheading; next, they rated how nine various subheadings would either make the page *much less appealing* (1) to *much more appealing* (7). Participants saw all nine headlines on the same page at the same time (although order was randomized by participant). The purpose of including all headlines on the same page was to allow participants to compare and contrast each of the headlines, in an effort to increase variability across responses. The rating page was programmed such that participants had to either rate all of the headlines *or* skip that page entirely. Thus, for the 582 participants who rated the headlines, there is no missing data on this questionnaire. See Appendix K for screenshots of the measure.

Headline selection.

CBT works for treating anxiety. In Study 3, participants indicated that they disliked a headline that only included the statement “CBT works” because it was ambiguous; thus, “CBT works for treating anxiety” was chosen given it explicitly states what CBT works for. Additionally, in Study 1, the two subheadings that beat baseline on the main objective (clicking “find a psychologist” button) started with “treatment works.” However, three other headlines included “treatment works,” and those did not beat baseline. So, there was mixed support for this phrasing. This subheading can be considered a gain framework message, given it highlights the positive consequences of engaging in treatment.

Understand your thinking. This subheading was included based on a suggestion from a Study 3 participant. The participant reported that the idea of learning how to understand thinking patterns (that may lead to anxious thinking) made this type of treatment sound appealing. This subheading could also be considered a gain framework message, given it also highlights a positive outcome of engaging in CBT.

Get control of your thinking. This subheading was also created in part based on conversations during Study 3. This one is similar to the subheading above, but focuses more on the idea that one can *control* the thoughts that may be causing distress. During one focus group, a participant was describing an experience with CBT and another participant tried to paraphrase, "it sounds like, is this where they would try to come up with techniques for you to, I don't know, control certain thoughts?" Moreover, perceived uncontrollability of worry is a feature of generalized anxiety disorder (compared to non-anxious controls; Craske, Rapee, Jackel, & Barlow, 1989), suggesting that including *controlling thoughts* as an outcome of CBT may be appealing to those experiencing anxiety. Again, this subheading also highlights a benefit of engaging in CBT.

CBT works: Say goodbye to symptoms. This subheading was included because it not only was a clear "winner" in Study 1 (on the For Patients & Families page), but also elicited positive comments from Study 3 participants. This subheading also explicitly states a positive outcome of engaging in CBT.

Studies show CBT works for treating anxiety. This subheading was chosen because it taps into the trust in science and research domain. In addition, Study 3 participants reported that the word "studies" was preferable to "science" and "research." In one focus group, a participant stated: "but so much of science and so much of research is funded by special interests and it's not objective. But somehow 'study' could be just somebody out there interviewing X number of people and doing a study on that. I don't know. It's probably negligible, the difference, but it feels like a more trustworthy word to me." Two other participants agreed with this statement; one called the word study more "intimate."

Scientists agree, CBT works for treating anxiety. This was included as a second trust in science and research subheading. Post-hoc analyses can test whether this subheading was actually less appealing than the subheading that included "studies," which would suggest generalizability of the comments made by participants in Study 3.

CBT works: No one has to go through anxiety alone. This subheading was met with positive comments from Study 3 participants and taps into a frequently cited barrier to seeking treatment: the desire to deal with emotional problems on one's own.

The American Psychological Association recommends CBT. This subheading addresses organizational support, and was met with mixed reviews during Study 3.

Millions are getting better, and you can too. While this subheading fits in the descriptive norms framework, it also is an adapted version of several headlines from Study 3. In the focus groups, some participants had negative comments about the headline "over half of people who get CBT get better." They reported that this raised the concern that almost half would *not* get better from CBT. Thus, this version of the subheading includes "millions," suggesting a lot of people are getting better, but does not highlight the efficacy of CBT. In Study 3, participants also reported that the heading "others are getting better with CBT. You can too" felt as if it was taking away the stigma of seeking treatment, given that it suggests that others are already seeking treatment.

Procedure

Participants first read and completed the Informed Consent form. Next, participants completed the mental health history, PHQ-4, CBT experience, and headline rating questionnaires. Participants then completed the ATSPPH and self-as-anxious identity questions in a randomized order. Participants also completed a brief Implicit Association Test (Nosek, Bar-Anan, Sriram, Axt, & Greenwald, 2014) (given Project Implicit requires studies to include a measure of implicit cognition), however those results are not discussed in the present manuscript given they were not part of the dissertation's scope. Those participants who completed all study components were fully debriefed on the purpose of the study and were given the option of seeing their implicit association measure feedback.

Study 4 Analyses and Results

Power analysis

In the dissertation proposal, the plan for analysis was to conduct a repeated measures, within-between interaction ANOVA to test effects of the five messages by individual difference measures on the three main outcome variables (credibility of CBT, interest in trying or recommending CBT, and clarity of message). As such, initial power analyses were conducted with this type of analysis. Alpha was set to .01 (to reduce possibility of Type I error with the large number of tests), power was set to .80, effect size was set to *f*=.25 (moderate effect size), .3 was set as the correlation strength between repeated measures (to be conservative) and there were 10 within-subjects levels (on the subheadings factor). For a moderator that has 5 levels (e.g., race), a sample size of 65 is recommended. However, Project Implicit samples tend to not be normally distributed for all demographic characteristics (e.g., racial breakdown for the applicant's recent publication from a Project Implicit sample was 76% white, 12% black, 5% biracial, 3% Asian, and 4% other; Werntz, Green, & Teachman, 2017). Assuming similar distributions for individual difference variables, the plan was to recruit 500 participants to maximize chances of having a sufficiently diverse sample to test for effects of race and ethnicity.

Main Analyses

Analytic plan. The proposed analyses for Study 4 were not appropriate for the data collected, as the actual method differed from the proposed method. Following data collection and discussions with statistics consultants, an analysis plan for Study 4 data was preregistered on the Open Science Framework prior to data analysis (https://osf.io/jebpv). Ultimately, the main question for Study 4 was to examine for whom do each of the subheadlines appeal to? Although it would be possible to compare how each demographic variable and each individual difference variable related to each subheadline (e.g., *t*-tests, correlations, and one-way ANOVAs), this approach would inflate the probability of Type I error and would not account for intersectional identities. Thus, Latent Profile Analysis (LPA) was used to identify mutually exclusive groups of

participants based on responses to headline preferences. We had no *a priori* hypotheses for the structure of the groups. Next, to examine whether group members significantly differed from other group members on demographic characteristics and individual differences, a Multinomial Logistic Regression was used.[1] We did not have *a priori* hypotheses about how demographic characteristics will relate to group membership.

Results.

Model estimation and selection. LPA is a person-centered mixture-modeling approach that is used to identify subgroups of underlying latent variables from data that uses continuous indicator variables (see Williams & Kibowski, 2015 for use in community-based research). In this study, an LPA approach was used to identify whether subgroups of individuals responded in similar patterns to the nine subheadings for the mock CBT website. Models were estimated using Mplus version 8.1 (Muthén & Muthén, 2017); an estimation procedure was used to obtain maximum likelihood estimates of all model parameters and individual posterior probabilities were derived from those estimates. Models were tested by increasing the number of classes until there were convergence issues or until model fit indices suggested that additional classes would not improve fit. Two indices were used in the present study to select the appropriate model: Bayesian Information Criterion (BIC) and entropy. BIC was chosen because it is commonly used in LPA model selection (Williams & Kibowski, 2015), and in simulation studies it is the best of the information criteria (however also note that bootstrap likelihood ratio test also is a consistent indicator of classes; Nylund, Asparouhov, & Muthén, 2007). With increasing sample size, compared to Akaike Information Criterion (AIC), BIC has a greater probability of selecting the true model, as long as there is a true model under consideration (Vrieze, 2012). An important limitation therefore is that we do not know whether there is a true model under

[1] In the preregistration, the planned follow up test was a Discriminant Function Analysis (DFA). However, we had not been clear that DFA could only handle continuous predictor variables. Thus, a Multinomial Logistic Regression was chosen instead to allow for both continuous and dichotomous predictor variables of group membership.

consideration in the current data, however we selected BIC given its common use in LPA model selection. An addition value used for model selection was entropy, which indicates the "posterior probabilities that the observations arouse from one of the mixture components" (Celeux & Soromenho, 1993, p. 14). Table 12 presents BIC and entropy values for all LPA models considered. Figure 1 shows the final model estimated that included three profiles with unequal variances across profiles. This model achieved the lowest BIC, had the highest entropy value, and consisted of classes that contained greater than 5% of the overall sample. Table 13 shows the means and variance estimates for each of the identified groups.

Model interpretation. The best-fitting model included three groups of participants with similar patterns of responding to the subheadings on a mock CBT website. Group 1 (*n* = 179, 30.76%) is characterized by low ratings of the majority of potential subheadings; in other words, individuals in this group rated most subheadings as making the mock website *less* appealing. One subheading, "Get control of your thinking," was rated overall by this group as *not* changing the appeal of the website, and one subheading was rated as making the website *more* appealing: "Understand your thinking." Surprisingly, this group rated "CBT works: say goodbye to symptoms" as the subheading to make the site the *least* appealing. This group had the most variable responses to the subheadings, and overall they thought the subheadings would make the CBT information less appealing. Given their variability in responses, this group will be named Discriminating Preferences.

Group 2 (*n* = 353, 60.65%) was the largest profile and individuals were less variable in their responses than those in the Discriminating Preferences group. Overall, most of the subheadings made the mock CBT website *slightly* more appealing. However, the subheading, "CBT works: say goodbye to symptoms," was the lowest-rated, and was judged as not changing the appeal of the mock website. The highest-rated subheading was "CBT works: no one has to go through anxiety alone," followed by "Understand your thinking." Overall, this group is

characterized by not being swayed by subheadings for a mock CBT site, so will be called Neutral Appeal.

The final group, Group 3 (n = 50, 8.59%) was the smallest group and rated all of the subheadings as making the mock CBT information site *more* appealing. Although the variability in responses was small, the group rated "No one has to go through anxiety alone" as making the page most appealing, and "The American Psychological Association recommends CBT" as making it least appealing (although still as more appealing than without a subheading). Given this group's willingness to find CBT information more appealing with a variety of headings than without a subheading, this group will be called High Appeal.

Predicting group membership. A standard multinomial logistic regression was used to predict class membership. Continuous predictors (age, education, political ideology, anxiety symptoms on the PHQ-4, attitudes about therapy, self-as-anxious explicit assessment, and rated appeal of mock website without a subheading) were checked for multicollinearity. The strongest correlation emerged between anxiety symptoms on the PHQ-4 and the self-as-anxious explicit assessment, $r(529) = .53$, $p < .001$. All continuous predictors were linearly related to the logit of the dependent variable (Box-Tidwell procedure; Box & Tidwell, 1962). A Bonferroni correction was applied given 21 terms were in the models (to test for this assumption; 13 predictors in the model plus eight natural log interaction terms), resulting in significance being accepted when $p < .0024$. Steps for this procedure were followed from Laerd Statistics (no date). Given that this assumption check was outlined for binary logistic regression, the model was run three times with the same predictors in the model to test for each of the three combinations of classes (there is no way to test the linearity for multinomial logistic regression). Continuous predictors were normally distributed (skewness and kurtosis for each variable were $< \pm 1.5$).

Owing to missing data in the predictor variables, 453 cases were used in this analysis (Discriminating Preferences class n = 136, Neutral Appeal class n = 278, High Appeal class n =

39). Gender, race (White vs. non-White), ethnicity (Hispanic/Latinx vs. not or unknown), whether someone endorsed experiencing an anxiety disorder in their lifetime, and whether someone had participated in CBT ever were entered as dichotomous predictors. Age, education, political ideology, anxiety symptoms scores on the PHQ-4, attitudes about therapy generally (ATSPPH), attitude about CBT, self-as-anxious explicit assessment, and rated appeal of the website without a subheading were all included as continuous predictors. Results indicated that the 13-predictor model provides a statistically significant prediction of class membership, -2 Log Likelihood = 734.15, $\chi^2(26, N = 453) = 55.89$, $p = .001$. The Nagelkerke pseudo R^2 indicated that the model accounted for 14.1% of the total variance. Prediction success varied across classes: Discriminating Preferences was correctly predicted 16.9% of the time, Neutral Appeal 94.6%, and High Appeal 7.7%. The overall prediction accuracy of the model was 63.8%.

Multinomal Logistic Regression predicts class membership when comparing two groups. Table 14 presents the regression coefficients, Wald test, the adjusted odds ratio (Exp[B]), and the 95% confidence intervals (CI) for odds ratios for each predictor.

Five of the 13 predictors were significant in predicting group membership between at least two groups; only race was significantly different across all three groups. See Table 10 for a breakdown of group demographic characteristics. When using race as a dichotomous predictor (White vs. non-White), the High Appeal group was most balanced in terms of race (58.0% White), Neutral Appeal was less balanced (73.1% White), and the Discriminating Preferences group was least balanced (83.8% White). Age significantly predicted group membership between the High Appeal (m = 43.90 years, sd = 13.83) and Discriminating Preferences (m = 38.86, sd = 14.26) groups, and the High Appeal and Neutral Appeal (m = 39.07, sd = 13.94) groups. Compared to the Neutral Appeal group, women were more likely to be in the Discriminating Preferences group. Individuals who reported having an anxiety disorder in their lifetime were more likely to be in the Discriminating Preferences group (45.8% of individuals reported having an anxiety disorder in their lifetime) compared to the Neutral Appeal group

(35.1%). Finally, the High Appeal group had more positive ratings of CBT (*m* = 5.68, *sd* = 1.35) compared to the Neutral Appeal group (*m* = 5.15, *sd* = 1.29). Neither were significantly different from the Discriminating Preferences group (*m* = 5.15, *sd* = 1.32).

In the current study, education, political ideology, current anxiety symptoms, attitudes about seeking therapy, self identity as anxious, appeal of site without subheadings, ethnicity, and whether someone had participated in CBT in the past did not predict group membership.

Given that the Neutral Appeal class tended to rate the appeal as not changing the information presented on the mock webpage, we were interested in examining whether this group responded in a biased way compared to the other classes. It is possible that if the group was apathetic to the information (or to the study as a whole), they would rate all the subheadings similarly – just "down the middle" on this page of the study. Moreover, if they were apathetic to the study, it is possible that they would provide the ratings on that page more quickly than individuals in the other two classes. To examine whether reaction time on this part of the study differed across groups, a one-way ANOVA was conducted. One reaction time was removed for this analysis, given it seemed like an impossible amount of time for someone to spend on the task (whereas the rest of the reaction times were between 7.96 seconds and 11.18 minutes [*M* = 1.18 minutes, *SD* = .84 minutes], one individual spent 108.24 minutes on the page). There were no significant differences in reaction time across classes, $F(2, 578) = 1.48$, $p = .229$, suggesting that the Neutral Appeal class did not respond more quickly than the other two classes during the ratings task.

Post-hoc Data Exploration

Self-identified race was the single variable that significantly differed across each of the three groups identified from the LPA. Although not planned in the preregistration, we opted to explore whether racial groups found specific subheadings more appealing than others.

General appeal of subheadings. A one-way repeated measures ANOVA was conducted to examine whether the full sample, on average, rated the appeal of the various

subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 677.54$, $p < .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .75$). The results of the one-way repeated measures ANOVA revealed that there was a significant effect of wording of the subheadings on their appeal, $F(6.00, 3486.07) = 54.11$, $p < .001$. Figure 2 displays means of subheading appeal for the full sample and indicates significant post-hoc tests. "CBT works: Say goodbye to symptoms" was given a lower rating than all other subheadings, while "Understand your thinking" was given the highest rating (although was not significantly different from the second-highest rated subheading, "CBT works: No one has to go through anxiety alone").

Appeal of subheadings based on race. Given one of the main findings from the multinomial logistic regression was that race (White vs. non-White) predicted class membership, we were interested in examining how different racial groups rated the subheadings, see Figure 3. To test this, five one-way repeated measures ANOVAs were conducted; a Bonferroni correction was used, so significance was set to $p < .01$ ($p = .05$ divided by 5 tests). Racial groups were binned as: Asian individuals (self-selected as either East or South Asian), Black or African American individuals, White individuals, multiple racial identities were selected, or other or unknown was selected (options were Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, or other/unknown).

Asian individuals. A one-way repeated measures ANOVA was conducted to examine whether Asian individuals ($n = 19$), on average, rated the appeal of the various subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 82.04$, $p < .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon < .75$). The results of the one-way repeated measures ANOVA revealed that there was not a significant effect of wording of the subheadings on their appeal for these individuals, $F(3.51, 63.21) = 3.13$, $p = .025$.

Black and African American individuals. A one-way repeated measures ANOVA was conducted to examine whether Black and African American individuals (n = 42), on average, rated the appeal of the various subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 130.13$, $p < .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon < .75$). The results of the one-way repeated measures ANOVA revealed that there was not a significant effect of wording of the subheadings on their appeal for these individuals, $F(4.48, 183.76) = 1.51$, $p = .195$.

White individuals. A one-way repeated measures ANOVA was conducted to examine whether White individuals (n = 437), on average, rated the appeal of the various subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 532.74$, $p < .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon < .75$). The results of the one-way repeated measures ANOVA revealed that there was a significant effect of wording of the subheadings on their appeal for these individuals, $F(5.94, 2589.62) = 44.73$, $p < .001$. Post-hoc comparisons revealed very similar results to the full sample.

Individuals with multi-racial backgrounds. A one-way repeated measures ANOVA was conducted to examine whether these individuals (n = 43), on average, rated the appeal of the various subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 67.65$, $p = .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon < .75$). The results of the one-way repeated measures ANOVA revealed that there was a significant effect of wording of the subheadings on their appeal for these individuals, $F(5.76, 242.00) = 5.33$, $p < .001$. "CBT works: Say goodbye to symptoms" was rated as significantly less appealing than "Studies show CBT works for treating anxiety," "Get control of your thinking", and "CBT works: No one has to go through anxiety alone;" "Millions are getting better, and you can too" was significantly less appealing than "Get control of your thinking."

Individuals from an unknown race or other race than listed above. A one-way repeated measures ANOVA was conducted to examine whether these individuals (n = 37), on average, rated the appeal of the various subheadings differently. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(35) = 66.93$, $p = .001$; thus, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon < .75$). The results of the one-way repeated measures ANOVA revealed that there was not a significant effect of wording of the subheadings on their appeal for these individuals, $F(5.51, 198.52) = 4.11$, $p = .001$. "Scientists agree, CBT works for treating anxiety" was less appealing than "Studies show CBT works for treating anxiety" and "Understand your thinking."

General Discussion

Across four studies, this dissertation examined whether brief subheadings on webpages describing evidence-based treatments for anxiety disorders and PTSD would affect both treatment-seeking behaviors and attitudes about treatment. A multi-method approach to understanding how to most effectively frame treatment was used. Study 1 took advantage of the publication of the APA's first Clinical Practice Guideline and was a field study examining the effect of subheadings on visitor behavior at a real website. Study 2 sought to conceptually replicate Study 1 findings in a web-based sample at Project Implicit, an online educational and research site. Study 3 was a series of focus groups with the goal of gathering rich, qualitative data about why specific subheadings may or may not make treatment information appealing to individuals who were high in anxiety symptoms (or had loved ones who they felt were high in anxiety symptoms). Finally, Study 4 was a large-scale online study with a Project Implicit sample that allowed us to examine for whom specific subheadings may make treatment information more appealing.

Summary of Findings

Studies 1 and 2. Study 1 consisted of field experiments on three pages of the APA's Clinical Practice Guideline for the treatment of PTSD website. Site visitors were randomly

assigned to see one of the subheadings on the main landing page, the Treatments page, and the For Patients & Families page. On the main landing page and Treatments page, subheadings did not affect user behavior when measured by clicks on site content, page bounces (i.e., leaving the page without interacting with content), or time spent viewing the page, with two exceptions. First, on the landing page, individuals who saw the page with the subheading "Find a treatment to help you take back your life" were significantly more likely to stay on the page compared to those individuals who saw the page without a subheading. Second, on the Treatments page, individuals who saw the subheading "Patients can take back their lives" were less likely to click on links to learn more information about the treatments. Although statistically significant, these two findings could be spurious, given the reported subheadings only affected one of three measured outcomes on each page.

On the For Patients & Families page, more consistent results emerged. When presented with the subheading "Treatment works: Say goodbye to symptoms," site visitors were more likely to click on the "Find a Psychologist" button, were less likely to bounce (i.e., more likely to interact with page content), and were more likely to spend more time on the page. Two additional headlines ("Science says, treatment works" and "Others are getting better, you can too") were associated with fewer page bounces and longer time spent on the page, but not with more clicks to the "Find a Psychologist" button. Importantly, the subheadings for all three pages were written with potential consumers in mind, and only the For Patients & Families page – clearly targeted toward individuals struggling with PTSD and their loved ones – showed more consistent, significant intervention results.

Failure to replicate or meaningful differences across studies. The seemingly promising results of Study 1C (on the For Patients & Families page) were not replicated across webpages (Studies 1A and 1B) or in Study 2. One interpretation is that Study 1C results were spurious, whereas another interpretation is that the results show specificity based on the webpage and likely sample viewing the subheadings. Unfortunately, there is no clear way to tease apart these

possibilities given the collected data. With respect to the lack of consistent results across webpages, it is notable that the subheadings were written with potential consumers of treatment (and their family) as the primary target (i.e., focused on addressing barriers to them seeking treatment), rather than clinicians, researchers, or other interested stakeholders being the main target. This may partly explain the different results across webpages, as the For Patients & Families page is the only webpage where we can reasonably assume that the main visitors are potential consumers. Providing messaging about saying goodbye to symptoms or not having to suffer alone is unlikely to be as relevant to providers or other stakeholders as the messages would be to potential consumers. This may be especially relevant to explain the null results on the Treatments page (Study 1B), which explicitly states "The information below about the recommended interventions is intended to provide clinicians with a basic understanding of the specific treatment approach." Therefore, subheadings written for potential consumers (or their family members) may not have been relevant to that page's target audience.

With respect to the lack of a conceptual replication in Study 2, it is noteworthy that these participants were adults who were registered Project Implicit psychology research volunteers. There were no restrictions for the sample, except that the participants had to be U.S. citizens (to reduce the influence of cross-national differences in this initial set of studies). Thus, this was a difficult replication test in that the majority of the Study 2 sample would likely not share the same motivations (seeking treatment information) as the sample from Study 1C. It is plausible that participants' motivations likely differentiate the two samples in very important ways, though this requires us making assumptions given motivation was not directly measured. It may be that simple changes to messages about evidence-based treatment information matter when the audience is motivated to learn about the treatments and thus perhaps pays more attention to details of the message framing. Clearly though, based on these two initial studies for this dissertation, there is not yet a consistent way of using subheadings to reliably change individuals' behaviors while browsing information regarding evidence-based treatments for

PTSD. However, the current work highlights a low-cost, efficient method for future research in this area.

The timing of the launch of the Clinical Practice Guideline for the treatment of PTSD offered a unique opportunity for study: The field study allowed for an investigation into how people who are presumably seeking treatment interact with a webpage offering information about evidence-based treatments. However, the field study and subsequent conceptual replication effort are limited in that they focused on how treatment for one disorder may be promoted to potential consumers. To that end, Studies 3 and 4 in this dissertation broadened the focus to examine attitudes about evidence-based anxiety treatments (and not just PTSD treatments).

Study 3. Three focus groups were conducted to elicit feedback on subheadings for a hypothetical webpage describing the "gold standard" anxiety treatment: CBT. Two focus groups consisted of individuals currently struggling with anxiety; one focus group included family members of individuals with anxiety. These groups were selected to represent important stakeholders for anxiety treatments: individuals who are likely to need or seek treatment and individuals who would plausibly recommend treatment to a loved one. During the three focus groups, feedback was elicited on sample subheadings. One theme that emerged was that messages should not be negative; participants did not like subheadings that focused on what would potentially happen if someone did not engage in therapy or portrayed CBT as the only effective form of treatment. A second theme that emerged was that subheadings should be clear and avoid ambiguity. As discussed in the interim summary for Study 3, intolerance of uncertainty is a transdiagnostic cognitive pattern for many emotional disorders (see McEvoy, Carleton, Correa, Shankman, & Shihata, 2019, for review), so it is not surprising that individuals articulated that they would prefer clear, unambiguous messages.

The final theme that emerged was for messages to appropriately target specific audiences. Although some of the suggestions during the focus groups were comical/problematic

(e.g., “if you’re going to appeal to men, like a hot therapist chick is one way,”), it was thoughtful for participants to discuss why it is important to consider individual differences when promoting anxiety treatments. In fact, even within the relatively small number of focus group members, individuals varied in their responses to subheadings. For example, subheadings starting with “Science says” and “Research shows” were polarizing. Some participants appreciated the incorporation of science and research into the promotion of CBT, while others commented that this made the treatments less appealing. Thus, an obvious next step for this dissertation was to see whether there were groups of individuals responding in similar ways to subheadings, and if so, whether we could identify any demographic features that characterized these groups of individuals.

Study 4. In the final study of this dissertation, Latent Profile Analysis (LPA) was used to identify whether there were mutually exclusive groups of participants who responded in similar ways to subheadings for a mock website promoting CBT for the treatment of anxiety. Three classes emerged; 61% of the participants fell into the Neutral Appeal group, which as a whole found that all of the subheadings made the webpage information only slightly more appealing. Another group that emerged was the Discriminating Preferences group; 31% of participants fell into this pattern of responding. This group had the most variable pattern of responding to the subheadings and, overall, the headlines received relatively low ratings (i.e., made the presented information less appealing). This group only rated “Understand your thinking” as the subheading that made the treatment information more appealing. The final group was only 9% of the sample and we named this the High Appeal group. As the name implies, overall, all of the subheadings were rated as making the treatment information more appealing.

These results suggest that in approximately a third of the sample, getting the message “right” was important to the appeal of the content. The individuals in the Discriminating Preferences group seemed to be particularly sensitive to wording, while the remaining 70% largely rated the content as no more or less appealing based on the subheading. Thus, it is

possible that how treatment information is framed in this way only actually matters to a minority of individuals.

We were also interested in examining whether demographic variables could predict group membership, with the goal of characterizing the groups. Race as a dichotomous predictor (White vs. non-White) was the only demographic variable to differentially predict group membership across all three groups. The High Appeal group was most balanced in terms of race (58% White), Neutral Appeal was less balanced (73% White), and the Discriminating Preferences group was least balanced (84% White). Given these significant differences in racial composition of groups, we explored the appeal of the subheadings by specific racial group identification. Groups for these analyses were: Asian, Black/African American, White, Multi-racial, and other or unknown. In this sample, the subheadings did not affect the appeal of information about CBT for individuals who identified as Asian or Black or African American. Individuals who identified as multi-racial found “Get control of your thinking” and “Understand your thinking” as the most appealing subheadings, and found that these slightly increased the appeal of evidence-based treatment information. Individuals who identified as White or who were from another or unknown race found “Understand your thinking” to be the most appealing subheading, making the treatment information slightly more appealing.

These results suggest that the tested subheadings were not differentially appealing to individuals with Asian, Black, or African American backgrounds. While it is possible that racial identity does not influence how treatment information is made more (or less) appealing, it is also very likely that the tested subheadings were not written in a way that was appealing to these individuals. Thus, future work should seek to better understand how individuals from Asian, Black, and African American backgrounds would like to have treatment information framed to increase its appeal. Although a goal for Study 4 was to answer the “for whom” question, we are not able to provide concrete suggestions for subheadings for different groups of individuals based on race at this time.

In the full sample, the most appealing subheading was “Understand your thinking,” which made the mock webpage content slightly more appealing. Participants also found “CBT works: No one has to go through anxiety alone” to be appealing. On the other end, contrary to results from Study 1, “CBT works: Say goodbye to symptoms” was the least appealing of the subheadings in the full sample. This subheading made the treatment information slightly less appealing than if the mock webpage did not have a subheading, suggesting that this subheading may actually be harmful for promoting evidence-based anxiety treatments. Note that this was actually the subheading in Study 1 that *increased* user treatment-seeking behavior on the For Patients & Families page of the APA website, pointing to the lack of consistent results across samples and web sites.

Reasons for Discrepant Results Across Studies

It is important to note that this dissertation focused on promoting treatments for both PTSD and anxiety disorders. Until the latest edition of the *Diagnostic and Statistical Manual* (5^{th} edition), PTSD was considered an anxiety disorder (for the rationale to remove PTSD from the anxiety disorders, see Friedman, 2013; though see Zoellner, Rothbaum, & Feeny, 2011, for discussion re. continuing to conceptualize PTSD as an anxiety disorder). Although PTSD is now conceptualized as distinct from anxiety disorders, their treatment is similar. Many strongly supported therapies for both PTSD and anxiety disorders fall under the CBT umbrella of treatments. For example, according to the APA Clinical Practice Guideline site, the strongly recommended treatments for PTSD are Cognitive Processing Therapy, Cognitive Therapy, and Prolonged Exposure, which are all types of cognitive-behavioral therapies. Thus, for this dissertation, an initial – and potentially incorrect – assumption was that recommendations for frameworks to promote evidence-based treatments for these disorders would be similar.

In addition, the decision to assess treatment appeal for both disorders was made because we had the opportunity to collaborate with the APA during the launch of their Clinical Practice Guideline for the treatment of PTSD. In early discussions with APA staff, they made it

clear that they would be excited to use a data-driven approach to most effectively promote evidence-based treatments. The timing of this collaboration happened to coincide with the initial planning stages of this dissertation, and including an initial field study of the subheading manipulations in this dissertation seemed ideal. Given the value of speaking to treatments more broadly than only PTSD (and given the author's expertise in the treatment of anxiety disorders), the decision was made to broaden the scope of this dissertation to focus on the promotion of anxiety disorder treatments, and not just PTSD treatments.

As noted above, an assumption was made that findings would be similar across studies in this dissertation. However, the results suggest that efforts to make treatments more appealing to potential consumers may be specific to different disorders. In Study 1, "Treatment works: Say goodbye to symptoms" was the only subheading to effectively shift site visitor behavior in the direction of interacting more with site content on the For Patients & Families page. This suggests that the gain framework (highlighting the positive outcome of engaging in treatment) may be an effective way to make PTSD treatments appealing for potential consumers and their family members. This subheading also received positive comments from focus group participants (who were themselves struggling with anxiety or have loved ones with anxiety) in Study 3. However, in Study 4, "CBT works: Say goodbye to symptoms" was actually the *least* appealing subheading (in the full sample) for framing treatment for anxiety, and it was not preferred in Study 2. The reason for the discrepancy is not clear, though it is notable that the "Say goodbye to symptoms" subheading was viewed positively in the two cases in which the participants seemed more likely to have been symptomatic or have a family member who was symptomatic (Studies 1 and 3) but not in the cases where the samples were less likely to have the direct symptom links or experiences (Studies 2 and 4). Unfortunately, Study 2 did not have enough individuals reporting currently struggling with PTSD to examine whether this variable explains differences in reactions to subheadings. And, in Study 4, whether someone was currently struggling with anxiety was not a significant predictor of latent group membership.

Thus, there may also be a difference between individuals who are currently struggling with a disorder and those who are actively seeking out treatment information.

It is also possible that differences in the symptoms and stigma tied to various disorders could lead to differences in motivations for seeking treatment. Unfortunately, there is little research examining differences in explicit motivations for seeking therapy among individuals struggling with different types of disorders. However, early research in this area suggests that mental health symptoms differentially predict treatment-seeking behavior depending on diagnosis of an anxiety disorder, a mood disorder, or both (Fine et al., 2018). Note that prior work has found differences in length of delay to seek treatment across disorders, with individuals with anxiety disorders delaying seeking treatment more so than individuals with mood disorders (Wang et al., 2007). Thus, it is possible that different symptoms may lead to distinct motivations for seeking treatment, which may lead to differences in the appeal of certain messages. In the current study, the focus on PTSD in some studies and anxiety disorders more broadly in other studies may partly account for the discrepant results across studies if these disorders are associated with different motivations for seeking care.

There are also a number of methodological reasons why the results may not have replicated: a) Study 4 was a within-subjects design, requiring participants to rate subheadings against each other, while Studies 1 and 2 were between-subjects designs; b) the subheadings were not exactly the same across studies (Treatment works vs. CBT works). The results across studies could suggest that in the context of a live site, highlighting reducing symptoms is beneficial, but if individuals are asked to compare subheadings against each other, highlighting this outcome of treatment is not the most appealing (perhaps because participants are not aware of the effects of the subheadings so do not report differences when asked to compare the subheadings directly). To disentangle these possibilities, a next research step would be to take advantage of experimental designs, where target disorder (anxiety disorder vs. PTSD

treatments) and study design (within- versus between-subjects) could be manipulated, and the moderating effect of symptom level could be examined.

Focusing on Direct-to-Consumer Marketing

These studies do not provide a clear answer for how to frame evidence-based treatments to potential consumers, but it remains critical to determine what dissemination strategies (including message framing) will reliably influence engagement and motivation to seek treatment for different subpopulations given the treatment and practice gaps. In their discussion of direct-to-consumer marketing of evidence-based anxiety treatments, Gallo et al. (2013) argue that providers underutilize evidence-based treatments and that consumers do not have the knowledge about the effectiveness of these treatments. Recent research shows that there is a lack of knowledge about evidence-based psychotherapies among US adults (Becker et al., 2018; Mora Ringle et al., 2019). Gallo and colleagues note that with increased knowledge about treatment, consumers could create a market pull for treatments that work, ultimately pushing providers to offer these treatments.

With increased exposure to information about the treatments on the clinical practice guideline site, individuals may feel more empowered to request the treatments that have the strongest research support, though this remains to be tested. In an online study of adults who screened positively for PTSD, participants were asked how much control they would prefer over making PTSD treatment decisions: 23.6% reported wanting to make the decision themselves and 44.2% reported wanting to make the final decision after taking the doctor's opinion into account (Harik, Hundt, Bernardy, Norman, & Hamblen, 2016). If over 60% of individuals with PTSD report wanting to ultimately choose their treatment, shouldn't we, as treatment providers, want to help them make informed treatment decisions? Moreover, in a study of veterans who had elected to complete an evidence-based treatment for PTSD, veterans reported that they most frequently heard about these treatments from therapists, psychiatrists, and other veterans (Hundt et al., 2015) – suggesting there is room for improvement in promoting evidence-based

treatments in more easily accessible formats, such as websites, social media, and advertising. Recent research also suggests that messages promoting evidence-based treatments for PTSD need to be carefully crafted. In a sample of 31 veterans (either meeting criteria for PTSD or who had subthreshold PTSD) without evidence-based treatment experience, most of the veterans reported liking testimonials in videos about treatments, but reported that positive messages about the rates of success made them skeptical of true treatment efficacy (Kehle-Forbes, Gerould, Polusny, Sayer, & Partin, 2020).

Today, direct-to-consumer marketing for pharmaceuticals is commonplace and it causes some individuals to have conversations about prescription drugs with their doctors and to request specific drugs (Aikin, Swasy, & Braman, 2004). Despite valid criticisms associated with this trend, direct-to-consumer marketing of pharmaceuticals does to a certain extent inform patients about treatment options, increase medication compliance, and may reduce stigma associated with having the disorders (Ventola, 2011). However, psychologists face a practical barrier associated with promoting psychological treatments; unlike pharmaceuticals, the majority of evidence-based therapies are not proprietary and do not have the financial backing of large corporations. While this is certainly a challenge for future work, steps in creating motivating messages about psychotherapy may be an important step.

Revisiting Message Framing

In the current set of studies, the decision was made to create subheadings based on various frameworks and theories used to present treatment information. Across studies, theories were not necessarily pitted against each other, but instead were used to consider ways of framing information about evidence-based treatments for anxiety disorders and PTSD. A discussion of the relative “success” of the frameworks may be useful for future research.

Gain- versus loss-framing. Used frequently in health promotion efforts, gain-framed messages highlight the positive outcomes of performing or not performing a behavior, while loss-framed messages highlight negative consequences of performing or not performing a

behavior (Rothman & Salovey, 1997). Study 1 results supported the use of one of the two gain-framework messages tested: “Treatment works: Say goodbye to symptoms.” The other subheading using a gain-framework, “Treatment works: Feel like yourself again,” did not elicit similar behavioral changes among site visitors. Both of these allude to positive consequences of engaging in treatment for PTSD, but a focus group participant discussed why the latter may not resonate with her. She reported that she does not know what it would be like to “feel like herself,” given she has always struggled with anxiety. Thus, the “feel like yourself” potential gain did not resonate with her. However, consistent with Study 1 findings, there was positive endorsement for “say goodbye to symptoms.” Symptoms of anxiety were identified as aversive, so a reduction was seen as a positive outcome of seeking treatment. Though, in Studies 2 and 4, there was no evidence for the positive effects of noting symptom reduction. Most surprisingly, when participants were asked to compare subheadings to each other, “CBT works: Say goodbye to symptoms” was the lowest-rated subheading in a sample of research volunteers. Critically, these results *may* suggest that there is a difference between what motivates treatment-seeking behavior (based on clicks to the “Find a Psychologist” button on the APA website) and what makes treatment information explicitly more appealing (based on ratings of how engaging the content was in Study 2 and how appealing the content was in Study 4).

Although not directly addressing this question, there is convergent evidence to suggest that gain-framework messages influence treatment-engaging behavior. Recent evidence suggests that among veterans who have scheduled a specialty mental healthcare appointment for depression, those who received appointment reminders via mail with a gain-framework message (“If you go to your appointment, you will learn ways to improve your mood and emotional well-being”) were more likely to attend their appointment than those who received just the date and time in the letter, but were not significantly more likely to attend their appointment than those who received a loss-framed message (“If you do not go to your appointment, you will miss out on learning ways to improve your mood and emotional well-being;” Mavandadi, Wright,

Klaus, & Oslin, 2018). Interestingly, there is also recent evidence to suggest that highlighting the success rates of PTSD treatment may actually backfire; when asked to discuss reactions to videos promoting evidence-based treatments for PTSD, veterans with PTSD/subthreshold PTSD reported that they were skeptical of treatment description videos when outcomes of treatment were described too positively (Kehle-Forbes et al., 2020). Thus, finding a positive, yet believable description of the benefits of treatment may be most effective in motivating individuals to seek care.

Trust in science and research. In Study 1C, "Science says, treatment works" was associated with individuals engaging more with site content, in that visitors were less likely to bounce and more likely to spend more time on the page, as compared to the variant with no subheading. Interestingly though, "Research shows, treatment works" did not outperform the page without a subheading on either of those outcomes. In Study 3, focus group participants were split in their reactions to subheadings referencing science, however one individual noted that "study" sounds more "trustworthy" than "research" or "science." Subsequently, in Study 4, participants rated "Studies show CBT works for treating anxiety" as more appealing than the variant "Scientists agree, CBT works for treating anxiety" (with both subheadings roughly in the middle of the rankings). Across studies in this dissertation, it is clear that referencing research, science, and scientists is not the most effective way to make evidence-based treatments appealing to everyone. However, for some individuals, appealing to science may be important. Unfortunately, Study 4 results did not clearly provide descriptive evidence for whom subheadings that reference science may be most effective. Importantly, focus groups with African Americans with and without a history of participating in research revealed that many of these individuals reported that the term "medical research" has a negative connotation, as it "conjures up the term 'guinea pig'" and contributes to mistrust of the healthcare system (pg. 5; Scharff et al., 2010). Clearly, more research is necessary to examine reactions to appeals to science and research in this context and more research on audience segmentation is needed,

but it is reasonable to hypothesize that Black or African American individuals may be less likely to find these messages appealing.

In a recent survey of 1001 U.S. citizens, 33% of respondents reported that they are skeptical of science (3M, 2019). Interestingly, when these same individuals reported sources they would believe (or be skeptical of) with regard to scientific claims, 81% reported that they would believe someone who works in a scientific field, but 86% reported that they would be skeptical of social media posts making scientific claims, and 71% also would be skeptical of company websites making scientific claims. It would be interesting to consider how this may or may not work in treatment information dissemination. In this case, scientists in the field are sometimes also therapists, who could be seen as benefitting from individuals seeking therapy, which may potentially create skepticism. Moreover, it would be important to examine reactions to social media campaigns that disseminate information about mental health and therapy. Notably, the source on social media (e.g., companies selling a specific treatment versus individual testimonials) may influence the credibility of scientific messages. It is also not clear to what extent individuals think of treatment as a product of science; however, as a field we have labeled the treatments that work "evidence-based," seemingly trying to emphasize the scientific rigor of our methods. Thus, there is ample opportunity to better understand under what conditions it makes treatment more or less appealing to allude to its scientific backing.

Organizational support. Studies 1 and 2 of this dissertation focused on learning how subheadings may influence site visitor behavior on a webpage that was a product of the APA. The APA is the largest professional organization of psychologists (though it is not without its own controversy - see discussion of APA's role in enhanced interrogation techniques outlined in the Hoffman Report, released in 2014: (see https://www.apa.org/independent-review/ for more information; American Psychological Association, no date). Thus, it was a timely and important opportunity to be able to assess how to most effectively promote evidence-based treatments on their site. This also means that any results from Studies 1 and 2 need to be discussed within

this APA treatment guideline context. This raises the question of whether the results from Study 1 were not replicated in Study 2 because the site visitors during Study 1 may have been visiting the For Patients & Families page at the APA web site because they already considered the APA a trusted source, whereas the visitors to Project Implicit did not have this connection. This could mean the “Say goodbye to symptoms” subheading is only effective when individuals already find the source credible. However, this is speculative and would be important to test in future research.

This also raises the question of how this message framework may be viewed by individuals from underrepresented racial and ethnic groups. For example, mistrust of the healthcare system and clinical research among Black and African Americans stems from historical events (e.g., Tuskegee syphilis experiment) and experienced discrimination from healthcare providers (Scharff et al., 2010). However, it is not clear whether this sentiment generalizes to institutions of *mental* healthcare. Unfortunately, Study 1 did not allow for assessing demographic characteristics, but it would have been interesting to know who visited the APA site, and whether individuals from different cultural backgrounds found the information presented credible based on the source.

Describing norms. Although possibly a spurious finding, the subheading “Others are getting better, you can too” in Study 1 (For Patients & Families page) was associated with significantly fewer bounces on the page, as compared to no subheading, suggesting that this subheading may have encouraged site visitors to engage with content on the page. Focus group participants had positive reactions to the subheading, “Others are getting better with CBT. You can too.” They reported that this subheading made seeking treatment seem less stigmatizing. Interestingly, “Over half of people who get CBT get better,” was not seen as a useful marketing strategy. Focus group individuals did not like this subheading because it brought to mind that half of the individuals seeking treatment *will not* get better. This also seemed to highlight potential losses (e.g., loss of time engaging in treatment or emotional

difficulty of discussing mental health) associated with treatment if one does not get better. In Study 4, the subheading “Millions are getting better, and you can too” was rated as the second-to-least appealing among the subheadings (however, the subheading’s absolute mean rating suggested that participants did not find it made the information more or less appealing), suggesting this may not be an effective strategy for framing treatment messages.

Addressing norms is not a novel idea in mental health promotion efforts. For example, social norms have been extensively used in campaigns to reduce risky drinking behaviors among college students; there is even the National Social Norms Center at Michigan State University (http://socialnorms.org/) that seeks to promote these interventions. However, recent evidence suggests that there may be no significant effects of this type of intervention for risky drinking among college students (Foxcroft, Moreira, Almeida Santimano, & Smith, 2015). Despite extensive research examining whether using social norms in marketing campaigns reduces risky drinking, there does not appear to be research examining whether describing mental health treatment rates affects whether individuals will seek treatment.

A major limitation of this approach in the current context is figuring out which descriptive norms would be appropriate to use in dissemination efforts. Importantly, in the current study, descriptive norms were left intentionally vague; “others are getting better” did not include specific rates of efficacy, which is vastly different to how social norms are typically used in social science research. Typically, descriptive norms in interventions use rates of that behavior in a target population to describe what *most* of the others in that population are doing, with an effort to increase an individuals’ likelihood to engage in that behavior (e.g., "75% of the guests participated... by using their towels more than once;" Goldstein et al., 2008). However, rates of psychotherapy use are low. As noted in the introduction, fewer than 20% of individuals struggling with an anxiety disorder seek care from a healthcare professional (Kessler & Greenberg, 2002). Thus, it is reasonable to hypothesize that using this statistic would not necessarily make treatment seem more appealing. However, there may be ways to creatively

market psychotherapy using more precise frequencies that are actually convincing to individuals struggling with mental health difficulties (e.g., cases with particularly high treatment engagement or recovery or satisfaction rates).

Desire to handle problems on one's own. In Study 1, the subheadings directly addressing this common attitudinal barrier to seeking treatment did not seem to affect site visitor behavior on the three pages tested. In Study 3, the subheadings addressing this belief were described as portraying empathy for individuals struggling with anxiety, and one participant even clearly articulated that this subheading addresses this barrier: "I think it addresses one of the big barriers to therapy in my mind, which is a lot of people feeling like, yeah whatever problems I have, I should be taking care of those problems by myself." In Study 4, "CBT works: No one has to go through anxiety alone" was the second-highest rated subheading and did not significantly differ from the most appealing subheading, "Understand your thinking." These subheadings were rated as making the mock site content *slightly* more appealing, so there was only a small effect. However, it seemed to be consistently highly rated across racial groups, suggesting that this subheading was not particularly offensive to any one group, either.

It may be that those who are using social media may be particularly interested in connecting with others, so explicitly stating that suffering individuals do not have to go through a problem alone may be particularly effective. In a recent study, adolescent and young adult women who either have posted or positively endorsed eating disorder-consistent social media content (e.g., posts about how being thin is attractive or important) were recruited to participate in a study examining barriers to seeking mental health treatment. Among those who reported not seeking treatment for their eating disorder symptoms (who were in clinical or subclinical eating disorder range), the second most commonly reported barrier to seeking treatment was *that they should handle the problem on their own* (approximately 70% of the sample endorsed this barrier; Fitzsimmons-Craft et al., 2019). Although the cited study used social media to

recruit women with eating disorder symptoms, it is important to explore how social media may be able to address this attitudinal barrier.

The belief that one should handle problems alone is interesting in light of the ubiquity of social media in most individuals' lives (for example, recent data suggest that 69% of American adults use Facebook; Perrin & Anderson, 2019). Facebook's mission is "give people the power to build community and bring the world closer together" (Facebook, 2020). Twitter claims its values are "we believe in free expression and think every voice has the power to impact the world" (Twitter, 2020). Instagram's About page claims that it is "bringing you closer to the people and things you love" (Instagram, no date). These statements all share a common theme – social media platforms strive to connect people. In contrast, striking data suggest that Americans are also lonely; almost half of respondents in a sample of 20,096 American adults reported that they "sometimes" or "always" feel lonely (Cigna, 2018). In their recent paper describing predictions for how social media will affect marketing in the future, Appel, Grewal, Hadi, and Stephen (2020) predict that social media will be used to better combat loneliness and isolation in the near future. At this point, however, there seems to be very little research examining how social media may be effectively harnessed for promoting evidence-based psychological treatments and breaking down beliefs about the need to handle problems alone. Future research could examine how directly addressing this barrier may be differentially effective on different platforms, such as social media versus informational webpages (like the ones studied in this dissertation).

Framing Treatment Information for Diverse Audiences

Unfortunately, this dissertation was not able to identify whether specific subheadings were especially effective for specific groups of individuals. In Study 4, the High Appeal group (individuals who reported that all subheadings made the content more appealing) was the most racially diverse, however this does not allow us to make specific recommendations for subheadings for individuals from different backgrounds. Unfortunately, a major problem facing

our field is that individuals from diverse racial and ethnic backgrounds are traditionally not adequately represented in research trials (La Roche & Christopher, 2008), or in research on CBT more specifically (Hofmann et al., 2012; Voss Horrell, 2008). This then limits how clinicians can effectively plan treatment for individuals from diverse backgrounds (Williams, Beckmann-Mendez, & Turkheimer, 2013).

Although there are limitations in our knowledge of treatment efficacy for underrepresented racial and ethnic minorities in clinical research, treatment information dissemination efforts should not neglect these individuals. Recent research suggests that in a sample of caregivers who were concerned about their adolescent's substance use, individuals from underrepresented racial and ethnic groups were less likely to be able to define "evidence-based practice" and were more likely to have negative perceptions of the term, as compared to individuals who were not members of these groups (Becker et al., 2018). In the current study, Asian and African American individuals were not likely to vary in their ratings of the appeal of different subheadings for descriptions of CBT, while White individuals, individuals identifying as multiple races, and those who identified as from another or unknown race did vary in their ratings. Those who identified as multiple races were more likely to find "Get control of your thinking" and "Understand your thinking" as most appealing. Given these subheadings did not make the information any less appealing for individuals from African American/Black or Asian backgrounds, focusing on these subheadings may allow for more diverse individuals to be motivated to learn more about treatments like CBT. However, clearly more research is needed in this area; unfortunately, the focus groups in Study 3 were limited in their racial and ethnic background composition. Moving forward, researchers may consider hosting focus groups that allow diverse individuals to discuss the influence that their race and other aspects of their identities may have on their treatment seeking preferences and behaviors.

Limitations

One limitation of this series of four studies is that we took a broad approach to creating subheadings for webpages portraying information about evidence-based treatments for PTSD and anxiety disorders. The five frameworks described above were used to create subheadings and were not rigorously tested against direct comparison subheadings that would have provided support for the proposed mechanisms for treatment promotion. For example, similarly-worded loss- and gain-framed messages that varied only in the gain/loss frame component could have been tested against each other to assess for relative efficacy. While this decision was made to allow testing of a broad variety of messages for this initial evaluation, future research should strive to disentangle why each of the proposed frameworks may be more or less effective, in what settings they may be effective, and for whom they may be effective. Another limitation common to the studies is there was no assessment of actual treatment-seeking behaviors.

Future work should also examine the extent to which these messages work via relatively more automatic/less consciously controlled processes versus more deliberate processes. For example, the Elaboration Likelihood Model (Petty & Cacioppo, 1986) has been used to examine the relative efficacy of persuasive messages based on differences in whether thoughtful consideration of messages occurs vs. just quick, affective associations tied to messages. It is possible that the subheadings in Study 1 were effective because they worked on a more automatic, associative process (as site visitors were not explicitly asked to evaluate the messages), compared to those subheadings in Studies 2 and 4, which relied on ratings following conscious introspection of the site content.

This dissertation also only focused on one method of disseminating information: via informational webpages. It will be important for research to examine other methods of sharing information about evidence-based treatments. It is possible that effective messages on webpages may be different than persuasive messages from primary care providers, loved ones, or television advertisements. Motivation for seeking treatment also would likely interact with

message efficacy from various sources. For example, individuals actively searching for treatment information online may find brief subheadings (such as, “say goodbye to symptoms”) appealing because they are in distress from their symptoms. However, if someone is not actively seeking treatment but instead learns about it from their primary care provider or a television advertisement, the message may have to address barriers associated with seeking treatment.

In addition, the diverse methodologies used across the studies each had their own strengths and limitations:

Limitations of Studies 1 and 2. There were limitations to the field study methodology that need to be considered. First, all of the variants are confounded with organizational support, given that the information is listed on the APA website. So, while not explicitly listed in each subheading, organizational support of the treatment guideline is to an extent present in each condition. Second, it is notable that only 34 out of 2,843 visitors clicked on the “Find a Psychologist” button. While many site visitors may have been simply interested in APA’s first attempt at publishing clinical practice guidelines, likely more than 34 site visitors were suffering from PTSD. Thus, although our subheadings did statistically improve the original variant of the site, there is clearly a need to assess outcomes that will elicit a higher response rate. (Notably, it may also be the case that some site visitors already have a therapist and learning information about evidence-based treatments may promote a conversation with the current therapist. This would not be reflected by our measures.)

Critically, Google gives limited information about the statistics behind the results. Unfortunately, we are only able to compare the variants to baseline (which had no subheading), and we are unable to make post-hoc comparisons across variants. This is because Google does not provide complete parameters for the Bayesian models, and does not provide values that would allow for additional tests (e.g., values that would allow for comparisons of credible intervals). Moreover, these results may be specific to these subheadings, this disorder, or these

particular treatments. We were also unable to examine moderators of the effect in the field study, given information about the sample was not available.

Analogously, the more controlled Study 2, administered on Project Implicit, also had limitations, including that most of the sample was likely not currently seeking information about PTSD treatments, limiting the study's ecological validity. It also was not possible across either sample to conduct subgroup analyses to consider audience segmentation; that is, whether certain messages appeal more to one subgroup than another (e.g., based on age, gender, race, symptom severity, etc.).

Limitations of Study 3. The purpose of the focus groups was to gather rich, qualitative data regarding attitudes about evidence-based anxiety treatments. However, the sample size was relatively low and not diverse in terms of race, ethnicity, or cultural background. All individuals were living in a predominantly White, liberal, college town, so our ability to generalize these findings is extremely limited. Moreover, we did not systematically assess individuals' mental health treatment histories, so individuals brought perspectives to the groups from a wide range of mental health experiences (e.g., one participant was an experimental psychologist with a PhD familiar with research on CBT, while another had never heard of CBT before). Thus, important future directions for focus groups will be to more formally assess prior treatment experiences, given this likely contributes to how individuals will perceive treatment information. Another limitation of Study 3 was that this author independently coded responses. Thus, it is possible that others would have picked up on different themes that emerged from the conversations. These limitations notwithstanding, the results of Study 3 informed the subheading selection for Study 4, and provide interesting insights for future study.

Limitations of Study 4. Like Study 2, a limitation of Study 4 is that the sample was not necessarily motivated to seek information about mental health treatment. Moreover, the majority of the sample did not report struggling with an anxiety disorder at the time of the study, and about half reported that they have a family member currently struggling with anxiety. Thus, it is

likely that the majority of participants did not necessarily find the information presented as particularly personally relevant or timely. Moreover, this sample is not representative of US adults broadly.

Conclusions

To our knowledge, this was the first multi-method set of studies to examine how small changes in wording of subheadings may affect the appeal of information about evidence-based treatments for PTSD and anxiety disorders. This dissertation leveraged the opportunity to study site visitor behavior during the launch of the APA's Clinical Practice Guideline for the treatment of PSTD (and included a conceptual replication study), included focus groups for rich and qualitative data on reactions to messages about evidence-based treatments, and used a large dataset to examine trends in explicit attitudes about the appeal of different subheadings for a mock CBT description webpage. Across studies, results were inconsistent, highlighting the need for future work to test new approaches to segment the intended audience and tailor specific messages based on those individuals' interests and background.

In addition, this is seemingly the first study of its kind to use Google Optimize and Analytics to answer a basic science question about dissemination of psychological treatments that is directly translatable to promotion of evidence-based care. Although these results failed to replicate in a more traditional, online research setting, this novel approach could be used in the future to examine the behaviors of individuals who are likely invested in seeking treatment information. Moreover, future work in this area can take advantage of recent advances in technology and predictive algorithms; Google Optimize and Analytics is free and automatically applies advanced statistical modeling techniques to answer questions that can have real-world impact.

Overall, results of this dissertation are mixed; however, they highlight the need for future work on disseminating information about evidence-based treatments to potential treatment consumers. It remains critical to create a "market pull" for these treatments. And, if adding just a

few words on a website page could reliably mean that more individuals seek evidence-based treatments, this methodology could be a very cost-effective way to help identify highly scalable strategies to promote care.

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Tables

Table 1. Study 1: Experiment A Results for Main Objective

Variant	Number of sessions	Conversions	Raw conversion rate	Modeled conversion rates (95% CI) compared to Original
Original	2307	798	34.59%	
Find a treatment supported by the best available research.	2299	731	31.80%	
Find a treatment supported by science.	2557	797	31.17%	
Find a treatment endorsed by the APA.	2457	789	32.11%	
Find a treatment to help you take back your life.	2812	845	30.05%	
Find a treatment to help you say goodbye to symptoms.	2419	813	33.61%	
Join others with PTSD who have found relief in treatment.	2386	746	31.27%	
You don't have to go through this alone; find a treatment that works.	2494	771	30.91%	

Table 2. Study 1: Experiment A Results for Page Bounces

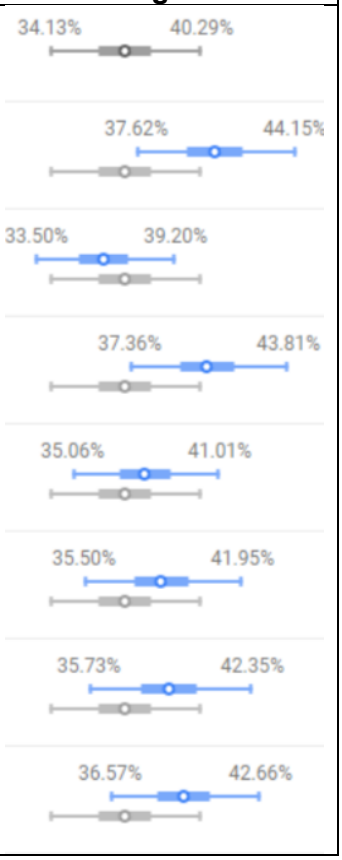
Variant	Number of sessions	Bounces	Raw bounce rate	Modeled bounce rates (95% CI) compared to Original
Original	2307	748	32.42%	
Find a treatment supported by the best available research.	2299	813	35.36%	
Find a treatment supported by science.	2557	817	31.95%	
Find a treatment endorsed by the APA.	2457	869	35.37%	
Find a treatment to help you take back your life.	2812	948	33.71%	
Find a treatment to help you say goodbye to symptoms.	2419	801	33.11%	
Join others with PTSD who have found relief in treatment.	2386	825	34.58%	
You don't have to go through this alone; find a treatment that works.	2494	874	35.04%	

Table 3. Study 1: Experiment A Results for Session Duration

Variant	Number of sessions	Total session duration	Raw average session duration	Modeled session duration (95% CI) compared to Original
Original	2307	143:10:52	0:03:43	
Find a treatment supported by the best available research.	2299	141:48:50	0:03:42	
Find a treatment supported by science.	2557	168:58:22	0:03:58	
Find a treatment endorsed by the APA.	2457	149:12:40	0:03:39	
Find a treatment to help you take back your life.	2812	194:46:07	0:04:09	
Find a treatment to help you say goodbye to symptoms.	2419	165:55:18	0:04:07	
Join others with PTSD who have found relief in treatment.	2386	152:23:16	0:03:50	
You don't have to go through this alone; find a treatment that works.	2494	160:40:12	0:03:52	

Table 4. Study 1: Experiment B Results for Main Objective

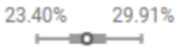
Variant	Number of sessions	Conversions	Raw conversion rate	Modeled conversion rates (95% CI) compared to Original
Original	795	213	26.79%	
Research shows strong support for four interventions for posttraumatic stress disorder, and conditional support for another four.	811	222	27.37%	
Scientists strongly support four interventions for posttraumatic stress disorder, and conditionally support another four.	775	209	26.97%	
Patients can take back their lives.	970	211	21.75%	
Patients can say goodbye to their symptoms.	784	204	26.02%	
Patients don't have to suffer with posttraumatic stress disorder.	703	196	27.88%	
Patients are getting better. Find treatments that work to help you.	677	179	26.44%	
Those with PTSD don't have to suffer alone.	740	229	30.95%	

Table 5. Study 1: Experiment B Results for Page Bounces

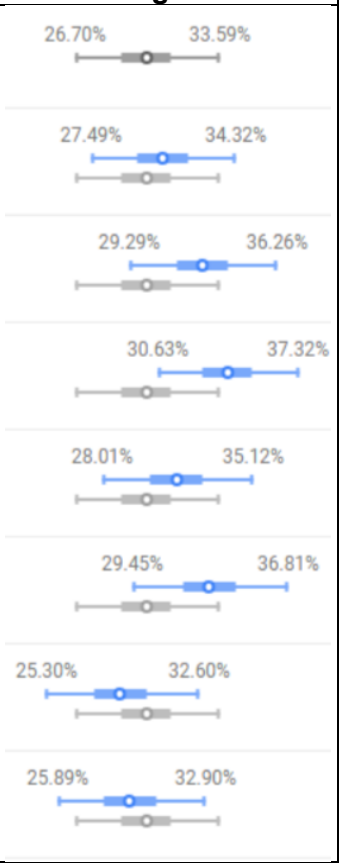
Variant	Number of sessions	Bounces	Raw bounce rate	Modeled bounce rates (95% CI) compared to Original
Original	795	238	29.94%	
Research shows strong support for four interventions for posttraumatic stress disorder, and conditional support for another four.	811	251	30.95%	
Scientists strongly support four interventions for posttraumatic stress disorder, and conditionally support another four.	775	253	32.65%	
Patients can take back their lives.	970	327	33.71%	
Patients can say goodbye to their symptoms.	784	247	31.51%	
Patients don't have to suffer with posttraumatic stress disorder.	703	232	33.00%	
Patients are getting better. Find treatments that work to help you.	677	194	28.66%	
Those with PTSD don't have to suffer alone.	740	214	28.92%	

Table 6. Study 1: Experiment B Results for Session Duration

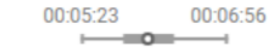
Variant	Number of sessions	Total session duration	Raw average session duration	Modeled session duration (95% CI) compared to Original
Original	795	82:39:12	0:06:14	
Research shows strong support for four interventions for posttraumatic stress disorder, and conditional support for another four.	811	76:48:43	0:05:41	
Scientists strongly support four interventions for posttraumatic stress disorder, and conditionally support another four.	775	80:07:57	0:06:12	
Patients can take back their lives.	970	104:22:00	0:06:27	
Patients can say goodbye to their symptoms.	784	80:26:17	0:06:09	
Patients don't have to suffer with posttraumatic stress disorder.	703	69:33:33	0:05:56	
Patients are getting better. Find treatments that work to help you.	677	75:29:44	0:06:41	
Those with PTSD don't have to suffer alone.	740	84:35:40	0:06:52	

Table 7. Study 1: Experiment C Results for Main Objective

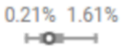
Variant	Number of sessions	Conversions	Raw conversion rate	Modeled conversion rates (95% CI) compared to Original
Original	618	4	0.65%	
Treatment works: Feel like yourself again.	342	6	1.75%	
Treatment works: Say goodbye to symptoms.	195	4	2.05%	
Science says, treatment works.	259	2	0.77%	
Research shows, treatment works.	312	4	1.28%	
The APA supports these recommended treatments.	505	5	0.99%	
Others are getting better, you can too.	288	4	1.39%	
Treatment works: No one has to go through PTSD on their own.	324	5	1.54%	

Table 8. Study 1: Experiment C Results for Page Bounces

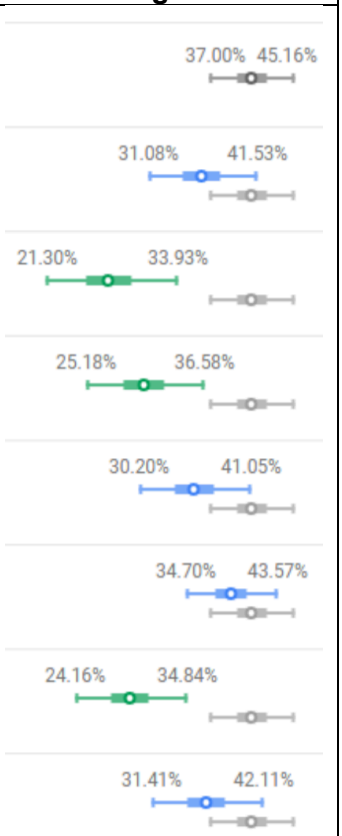
Variant	Number of sessions	Bounces	Raw bounce rate	Modeled bounce rates (95% CI) compared to Original
Original	618	253	40.94%	
Treatment works: Feel like yourself again.	342	124	36.26%	
Treatment works: Say goodbye to symptoms.	195	53	27.18%	
Science says, treatment works.	259	79	30.50%	
Research shows, treatment works.	312	110	35.26%	
The APA supports these recommended treatments.	505	196	38.81%	
Others are getting better, you can too.	288	84	29.17%	
Treatment works: No one has to go through PTSD on their own.	324	119	36.73%	

Table 9. Study 1: Experiment C Results for Session Duration

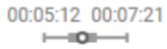
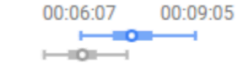
Variant	Number of sessions	Total session duration	Raw average session duration	Modeled session duration (95% CI) compared to Original
Original	618	63:59:15	0:06:13	
Treatment works: Feel like yourself again.	342	36:57:45	0:06:29	
Treatment works: Say goodbye to symptoms.	195	28:52:12	0:08:53	
Science says, treatment works.	259	36:47:21	0:08:31	
Research shows, treatment works.	312	36:23:34	0:07:00	
The APA supports these recommended treatments.	505	49:51:35	0:05:55	
Others are getting better, you can too.	288	41:15:10	0:08:36	
Treatment works: No one has to go through PTSD on their own.	324	40:31:54	0:07:30	

Table 10. Study 4: Demographic Characteristics

	Count (%)			
	Full sample (*N* = 582)	Discriminating Preferences (*n* = 179)	Neutral Appeal (*n* = 353)	High Appeal (*n* = 50)
Gender				
Female	404 (69.4)	136 (76.0)	231 (65.4)	37 (74.0)
Male	177 (30.4)	42 (23.5)	122 (34.6)	13 (26.0)
Education				
Less than high school degree	7 (1.2)	2 (1.1)	4 (1.1)	1 (2.0)
High school degree	13 (2.2)	2 (1.1)	10 (2.8)	1 (2.0)
Some college	157 (27.0)	48 (26.8)	94 (26.6)	15 (30.0)
Bachelor's degree	210 (36.1)	68 (38.0)	123 (34.8)	19 (38.0)
Advanced degree	192 (33.0)	58 (32.4)	120 (34.0)	14 (28.0)
Race				
Asian	19 (3.2)	4 (2.3)	11 (3.1)	4 (8.0)
Black or African American	42 (7.2)	7 (3.9)	27 (7.6)	8 (16.0)
White	437 (75.1)	150 (83.8)	258 (73.1)	29 (58.0)
More than one race	43 (7.4)	7 (3.9)	32 (9.0)	4 (8.0)
Other or unknown	37 (6.6)	11 (6.2)	21 (5.9)	5 (10.0)
Ethnicity				
Hispanic or Latinx	56 (9.6)	14 (7.8)	36 (10.2)	6 (12.0)
Not Hispanic or Latinx	478 (82.1)	149 (83.2)	289 (81.9)	40 (80.0)
Unknown	30 (5.2)	12 (6.7)	15 (4.2)	3 (6.0)
Political ideology				
Strongly conservative	20 (3.4)	7 (3.9)	13 (3.7)	0 (0.0)
Moderately conservative	52 (8.9)	20 (11.2)	27 (7.6)	5 (10.0)
Slightly conservative	34 (5.8)	10 (5.6)	21 (5.9)	3 (6.0)
Moderate/neutral	153 (26.3)	43 (24.0)	98 (27.8)	12 (24.0)
Slightly liberal	43 (7.4)	11 (6.1)	28 (7.9)	4 (8.0)
Moderately liberal	143 (24.6)	37 (20.7)	94 (26.6)	12 (24.0)
Strongly liberal	115 (19.8)	45 (25.1)	58 (16.4)	12 (24.0)

Table 11. Study 4: Mental Health History, Treatment History, and Attitudes About Treatment

	Count (%)
Not currently struggling with an anxiety disorder	403 (69.2)
Currently struggling with an anxiety disorder	170 (29.2)
No past experience with an anxiety disorder	366 (62.9)
Previously struggled with an anxiety disorder	205 (35.2)
Not currently *and* never have struggled with an anxiety disorder	340 (58.4)
Current treatment	
In therapy	107 (18.4)
Taking prescription medication(s) for psychological or emotional difficulty	137 (23.5)
Previous treatment	
Therapy	252 (43.3)
Prescription medication(s)	178 (30.6)
CBT experience	
Yes, similar to description	112 (19.2)
Yes, different from description	40 (6.9)
No	410 (70.4)
Has a family member currently struggling with anxiety	296 (50.9)
Has a close friend currently struggling with anxiety	183 (31.4)
Someone else close is currently struggling with anxiety	72 (12.4)
PHQ-4 General Psychological Distress	
None	357 (61.3)
Mild	129 (22.2)
Moderate	61 (10.5)
Severe	32 (5.5)
PHQ-4 Anxiety subscale, screened positive for anxiety (≥3)	115 (19.8)
PHQ-4 Depression subscale, screened positive for depression (≥3)	68 (11.7)
Attitude toward CBT	
Extremely negative	4 (.7)
Somewhat negative	5 (.9)
Slightly negative	17 (2.9)
Neutral	212 (36.4)
Slightly positive	64 (11.0)
Somewhat positive	161 (27.7)
Extremely positive	115 (19.8)

Table 12. Study 4: Model Fit Indices for Latent Profile Analyses

		Number of Latent Classes				
		1	**2**	**3**	**4**	**5**
Equal Variances	**BIC**	20135.27	19452.50	19101.37	19000.11	18938.28*
	entropy	-	.72	.85	.86	.85
Unequal Variances	**BIC**	-	19297.74	18859.69	18776.81*	-
	entropy	-	.80	.87	.86	-

*Contains at least one class with <5% of sample

Table 13. Study 4: Means and Variance Estimates for the Groups Identified by LPA

	Group 1 "Discriminating Preferences"		Group 2 "Neutral Appeal"		Group 3 "High Appeal"	
	Means estimate (SE)	Variance estimate (SE)	Means estimate (SE)	Variance estimate (SE)	Means estimate (SE)	Variance estimate (SE)
CBT works for treating anxiety	3.29 (.16)	2.51 (.23)	4.70 (.07)	0.85 (.11)	6.36 (.15)	0.29 (.08)
Studies show CBT works for treating anxiety	3.58 (.17)	3.10 (.29)	4.91 (.09)	1.01 (.09)	6.44 (.14)	0.36 (.10)
Scientists agree, CBT works for treating anxiety	3.12 (.16)	2.84 (.31)	4.60 (.10)	1.25 (.13)	6.29 (.17)	0.54 (.17)
Understand your thinking	4.72 (.18)	4.46 (.37)	4.95 (.09)	1.76 (.14)	6.43 (.13)	0.50 (.11)
Get control of your thinking	3.98 (.19)	4.40 (.28)	4.78 (.10)	1.94 (.17)	6.30 (.17)	0.69 (.18)
CBT works: Say goodbye to symptoms	2.37 (.20)	2.00 (.31)	4.01 (.09)	1.57 (.13)	5.99 (.26)	1.17 (.37)
CBT works: No one has to go through anxiety alone	3.68 (.21)	3.79 (.25)	5.09 (.08)	1.45 (.13)	6.50 (.16)	0.33 (.12)
The American Psychological Association recommends CBT	3.15 (.17)	3.14 (.31)	4.47 (.11)	1.77 (.18)	5.81 (.19)	1.39 (.25)
Millions are getting better, and you can too	2.67 (.18)	2.72 (.31)	4.35 (.11)	1.90 (.18)	6.42 (.15)	0.46 (.16)

Table 14. Study 4: Multinomial Logistic Regression Results

	Discriminating Preferences vs. Neutral Appeal						High Appeal vs. Neutral Appeal						Discriminating Preferences vs. High Appeal					
	b	SE-b	Wald	df	Exp(B)	95% CI Exp(B)	b	SE-b	Wald	df	Exp(B)	95% CI Exp(B)	b	SE-b	Wald	df	Exp(B)	95% CI Exp(B)
Intercept	0.38	1.01	0.14	1			**-5.68**	**1.80**	**9.95**	**1**			**6.05**	**1.91**	**10.00**	**1**		
Age	0.00	0.01	0.21	1	1.00	(0.99, 1.02)	**0.05**	**0.02**	**12.31**	**1**	**1.05**	**(1.02, 1.08)**	**-0.05**	**0.02**	**9.26**	**1**	**0.95**	**(0.93, 0.98)**
Education	0.03	0.14	0.03	1	1.03	(0.78, 1.36)	-0.19	0.22	0.74	1	0.83	(0.54, 1.28)	0.22	0.24	0.82	1	1.24	(0.78, 1.99)
Political Ideology	-0.01	0.07	0.04	1	0.99	(0.86, 1.13)	-0.08	0.12	0.48	1	0.92	(0.74, 1.16)	0.07	0.12	0.29	1	1.07	(0.84, 1.36)
PHQ-4 Anxiety	-0.15	0.08	3.62	**1**	0.86	(0.73, 1.01)	-0.02	0.13	0.03	1	0.98	(0.76, 1.26)	-0.13	0.14	0.85	1	0.88	(0.67, 1.16)
ATSPPH Sum	-0.02	0.03	0.67	1	0.98	(0.93, 1.03)	0.02	0.05	0.23	1	1.02	(0.94, 1.12)	-0.04	0.05	0.79	1	0.96	(0.87, 1.05)
Attitude about CBT	0.01	0.09	0.00	1	1.01	(0.84, 1.21)	**0.34**	**0.17**	**3.93**	**1**	**1.40**	**(1.00, 1.96)**	-0.33	0.18	3.41	1	0.72	(0.50, 1.02)
Self Identify as Anxious	-0.02	0.07	0.06	1	0.98	(0.86, 1.12)	0.05	0.11	0.23	1	1.06	(0.85, 1.31)	-0.07	0.12	0.35	1	0.93	(0.74, 1.18)
Appeal of Site without Subheadings	-0.09	0.08	1.40	1	0.92	(0.79, 1.06)	0.17	0.13	1.75	1	1.18	(0.92, 1.52)	-0.26	0.14	3.59	1	0.77	(0.59, 1.01)
Gender	**-0.66**	**0.26**	**6.35**	**1**	**0.52**	**(0.31, 0.86)**	-0.15	0.43	0.13	1	0.86	(0.37, 2.00)	-0.50	0.47	1.15	1	0.61	(0.24, 1.52)
Race	**0.70**	**0.29**	**5.65**	**1**	**2.01**	**(1.13, 3.58)**	**-1.14**	**0.39**	**8.35**	**1**	**0.32**	**(0.15, 0.69)**	**1.84**	**0.45**	**16.99**	**1**	**6.29**	**(2.62, 15.08)**
Ethnicity	0.28	0.39	0.53	1	1.32	(0.62, 2.82)	0.65	0.59	1.22	1	1.91	(0.61, 6.03)	-0.37	0.63	0.33	1	0.69	(0.20, 2.40)
Ever had an Anxiety Disorder	**-0.60**	**0.28**	**4.73**	**1**	**0.55**	**(0.32, 0.94)**	-0.44	0.45	0.94	1	0.64	(0.26, 1.57)	-0.16	0.48	0.11	1	0.85	(0.33, 2.19)
Ever Participated in CBT	-0.32	0.28	1.31	1	0.72	(0.42, 1.26)	0.00	0.47	0.00	1	1.00	(0.40, 2.50)	-0.33	0.49	0.44	1	0.72	(0.27, 1.90)

Note. Neutral Appeal class was the reference group for comparisons. Focus groups for the dichotomous variables were the following: men, White, non-Hispanic, never had an anxiety disorder, and no CBT experience. **Bolded** lines are significant parameter estimates, $p < .05$.

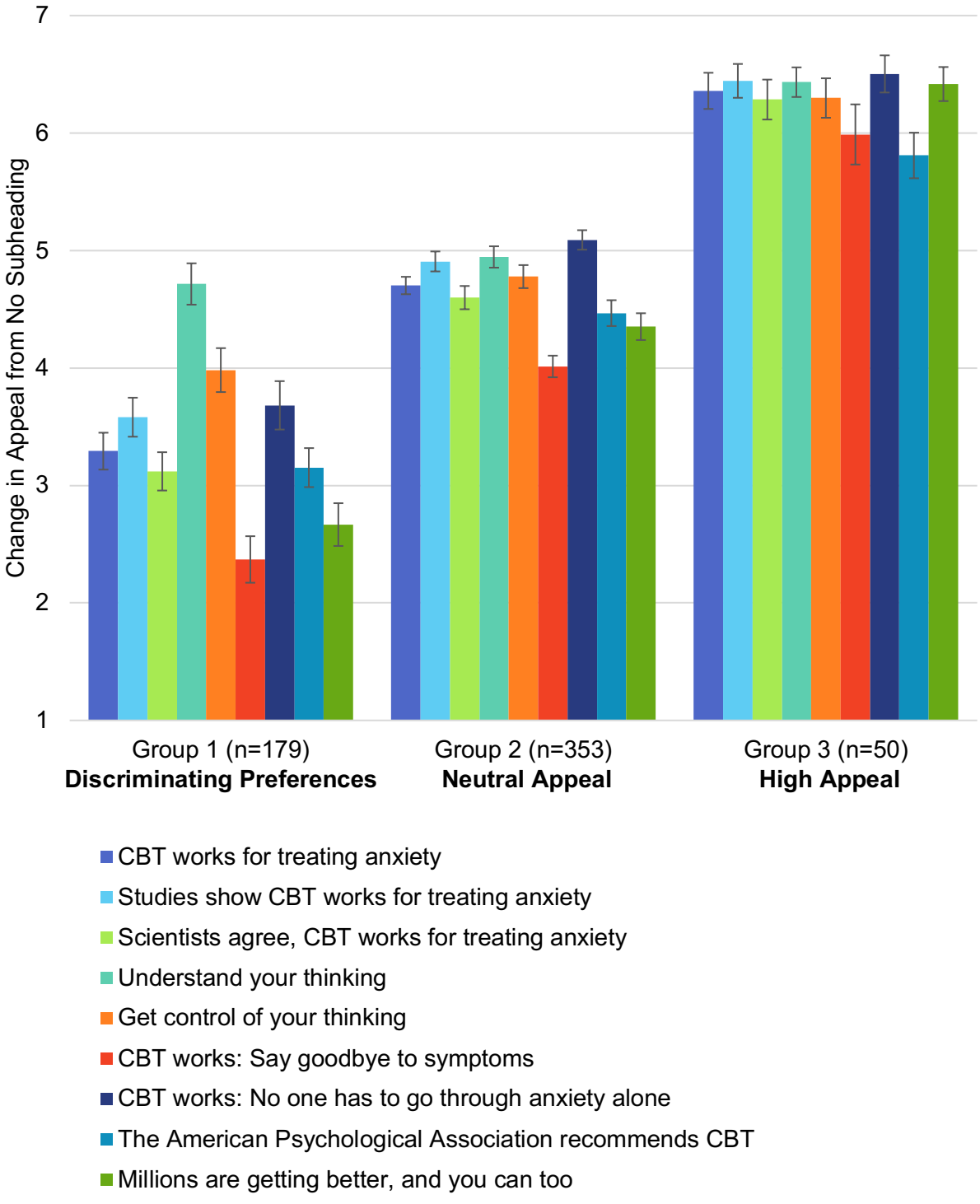
Table 15. Study 4: Race by Other Individual Characteristics

	Asian *n* = 19	Black/African American *n* = 42	White *n* = 437	Multi-racial *n* = 43	Other/Unknown *n* = 37	Test for differences
Age *m* (*sd*)	42.79 (13.67)[a]	41.61 (12.13)[a]	40.33 (14.31)[a]	34.14 (12.21)[ab]	30.84 (10.88)[b]	One-way ANOVA, $F(4, 573) = 6.17$, $p < .001$
Gender Female %	63.2	73.8	69.5	72.1	69.7	Pearson Chi-Square, $\chi^2(4) = .93$, $p = .921$
Education *m* (*sd*)	4.21 (0.79)[a]	4.10 (1.01)[ab]	4.01 (0.85)[ab]	3.86 (0.83)[a]	3.51 (1.22)[ac]	One-way ANOVA, $F(4, 571) = 3.43$, $p = .009$
Ethnicity Hispanic %	0.0	0.0	5.2	39.5	42.9	Pearson Chi-Square, $\chi^2(4) = 104.50$, $p < .001$
Ever had an anxiety disorder Yes, had an anxiety disorder %	15.8	36.6	40.0	56.1	40.2	Pearson Chi-Square, $\chi^2(4) = 9.28$, $p = .055$
Ever participated in CBT Yes, have had CBT %	0.0	26.2	28.6	27.9	25.7	Pearson Chi-Square, $\chi^2(4) = 7.60$, $p = .107$
Attitude about CBT *m* (*sd*)	4.83 (1.20)	5.10 (1.48)	5.26 (1.32)	4.95 (1.17)	5.11 (1.24)	One-way ANOVA, $F(4, 569) = 1.04$, $p = .389$
Political Ideology *m* (*sd*)	0.89 (1.78)	1.05 (1.45)	0.87 (1.74)	0.56 (1.98)	0.76 (1.52)	One-way ANOVA, $F(4, 552) = .47$, $p = .757$
Anxiety symptoms (PHQ-4) *m* (*sd*)	1.16 (1.07)	1.17 (1.51)	1.62 (1.73)	1.81 (1.76)	2.14 (2.18)	One-way ANOVA, $F(4, 570) = 1.99$, $p = .095$
ATSPPH Sum *m* (*sd*)	21.26 (3.53)	21.03 (6.13)	22.03 (5.11)	19.90 (5.81)	20.09 (5.20)	One-way ANOVA, $F(4, 521) = 2.50$, $p = .042$
Self-identify as anxious *m* (*sd*)	4.33 (1.88)	4.26 (2.05)	5.01 (2.10)	5.02 (2.02)	5.09 (2.16)	One-way ANOVA, $F(4, 524) = 1.54$, $p = .189$
Appeal of site without subheadings *m* (*sd*)	4.05 (1.58)	4.86 (1.78)	4.70 (1.50)	4.70 (1.49)	4.77 (1.5)	One-way ANOVA, $F(4, 570) = .99$, $p = .411$

Note. Cells with the same superscript letters are not significantly different from each other. Education is a continuous variable with 4 representing having a Bachelor's degree or completing some graduate school (with higher values reflecting more schooling). The full scale is located under Demographics and Mental Health History in Study 4.

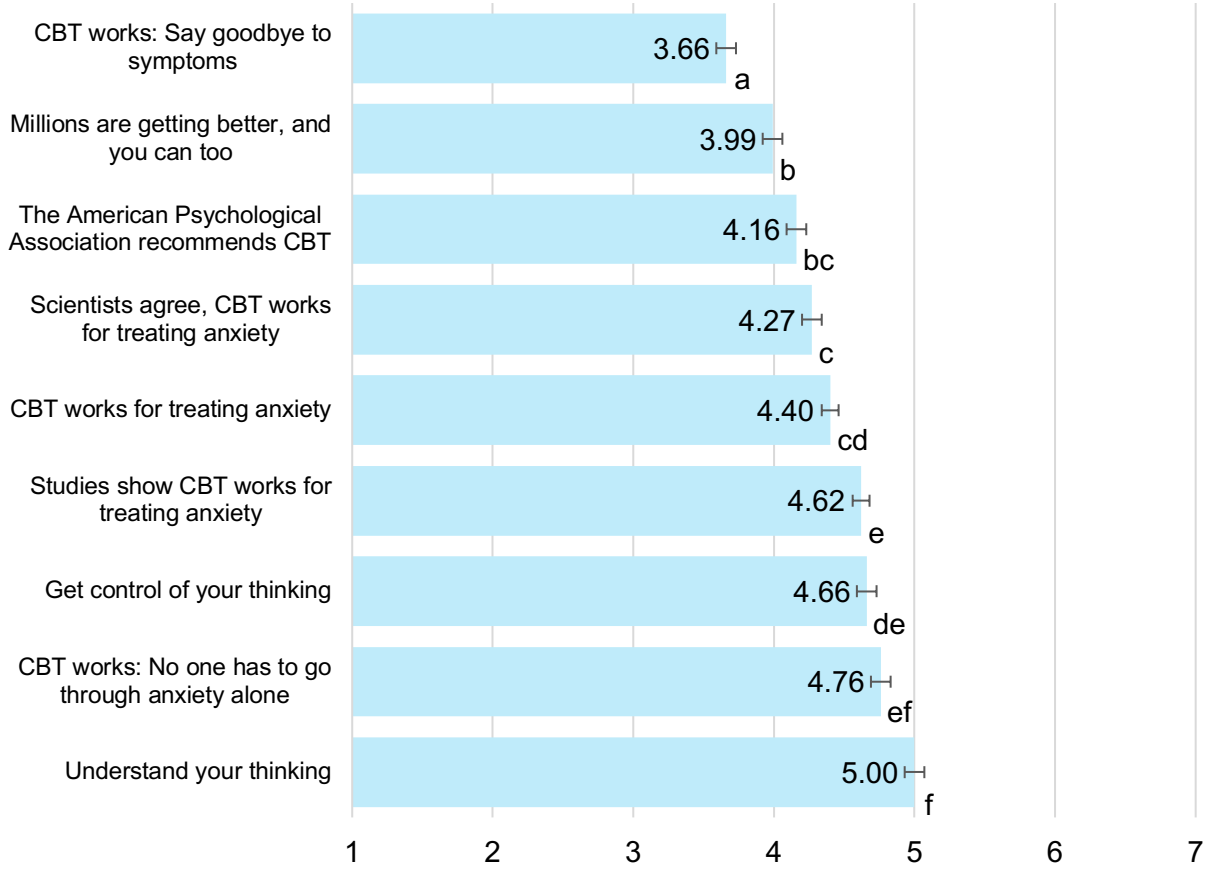
Figures

Figure 1. Study 4: Three class Latent Profile Analysis Model with class-specific variances



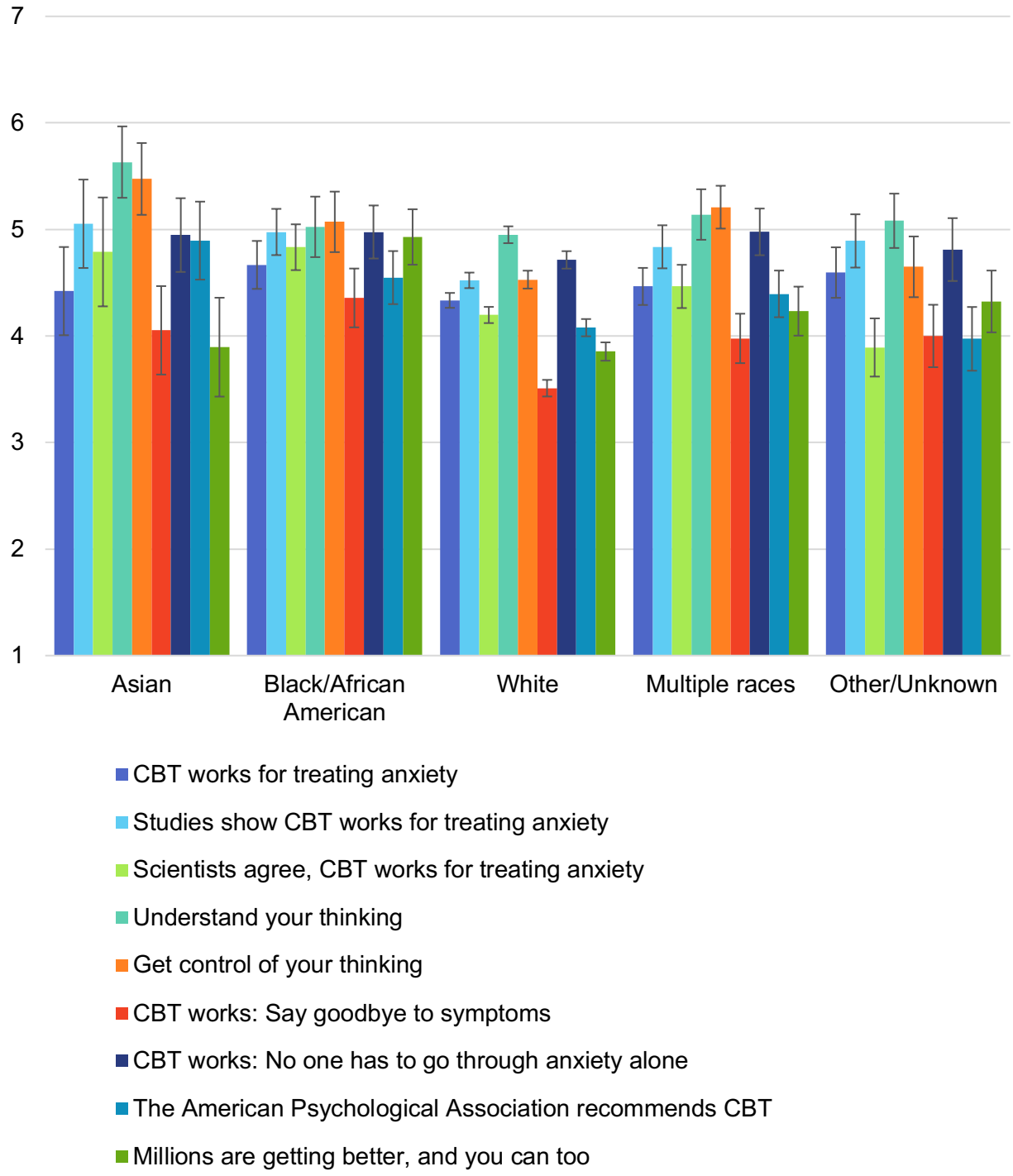
Note. Error bars represent ±1 standard error of the mean. The responses could range from *much less appealing* (1) to *much more appealing* (7).

Figure 2. Study 4: Estimated means of subheading appeal ratings



Note. Estimated means are shown in the bars on the graph (with standard error bars). Bars with the same letters in subscript are not significantly different from each other, *p*s > .05. The responses could range from *much less appealing* (1) to *much more appealing* (7).

Figure 3. Study 4: Subheading appeal by racial groups



Note. Significant differences emerged between subheadings for the White, multi-racial, and other/unknown groups. The responses could range from *much less appealing* (1) to *much more appealing* (7).

Appendices

Appendix A. Study 1: Glossary of Google terms

Bounce (Google, 2017a): Single page session on a website, where a user does not engage in any other way on the page. **Bounce rate** is the number of bounces over the number of all sessions.

Conversion (Google, 2017b): A completed task (e.g., clicking a link in the present study) by a user. **Conversion rate** is comparing the sessions with conversions to all sessions.

Session (Google, 2017d): A session is a set of website user actions within a given time frame. It starts when an individual arrives at the site, and ends when he/she leaves the site and does not return or is inactive for 30 minutes. Sessions start over at midnight, as well. Finally, if a user leaves the site but returns on the same campaign (i.e., through the same link) within 30 minutes, that is technically one session. If a user leaves the site but returns via a *different* link, that is a new session.

Session duration (Google, 2017e): Session duration is the amount of time spent on the site during a given session. **Average session duration** is total session duration divided by the number of sessions; thus, **total session duration** is the total amount of time spent on a website across all sessions. The format for values is hh:mm:ss.

Appendix B. Study 1: Screenshots of the APA experiments

Experiment A: Manipulating subheading on main website
Launched August 18, 2017

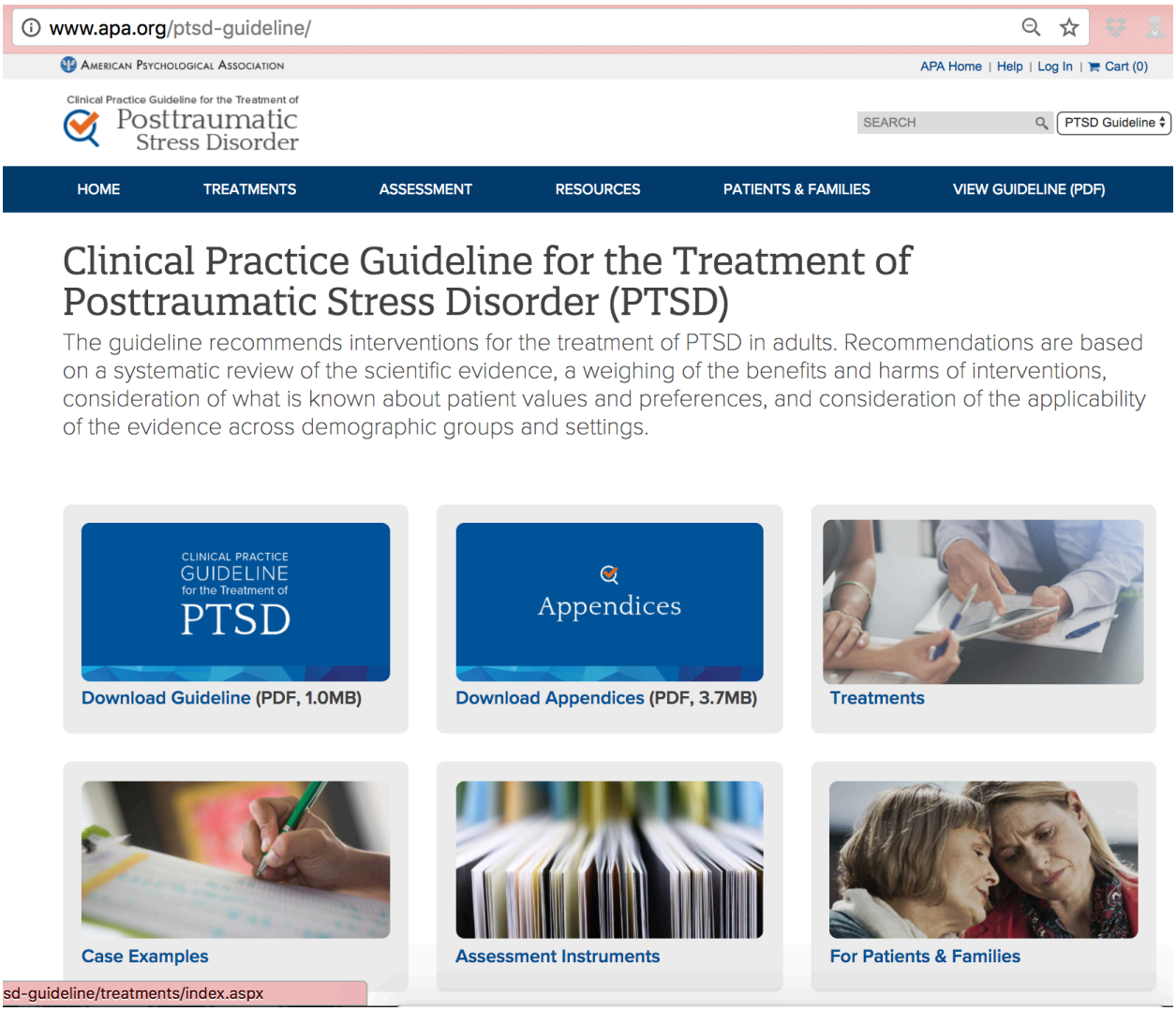


Figure 1. Main webpage of the site without manipulation.

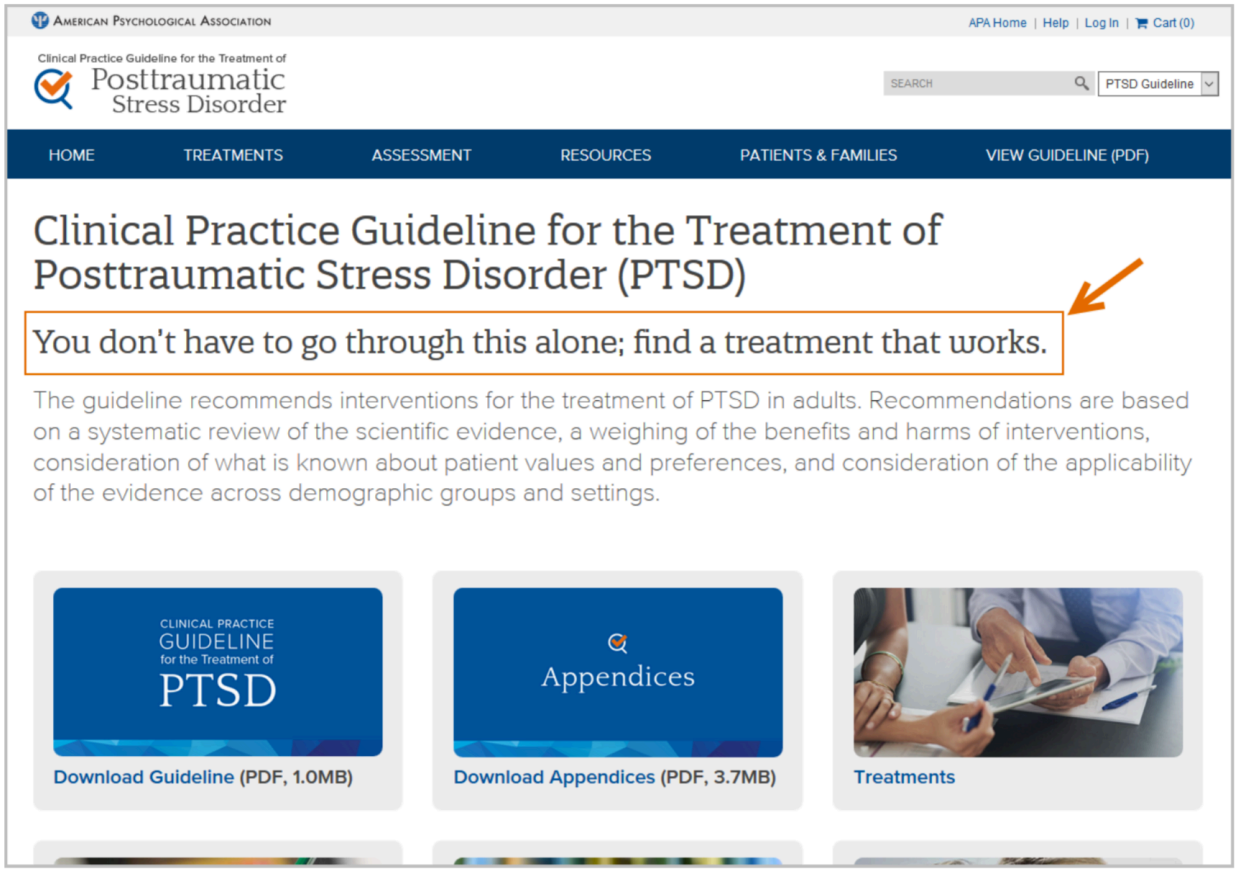


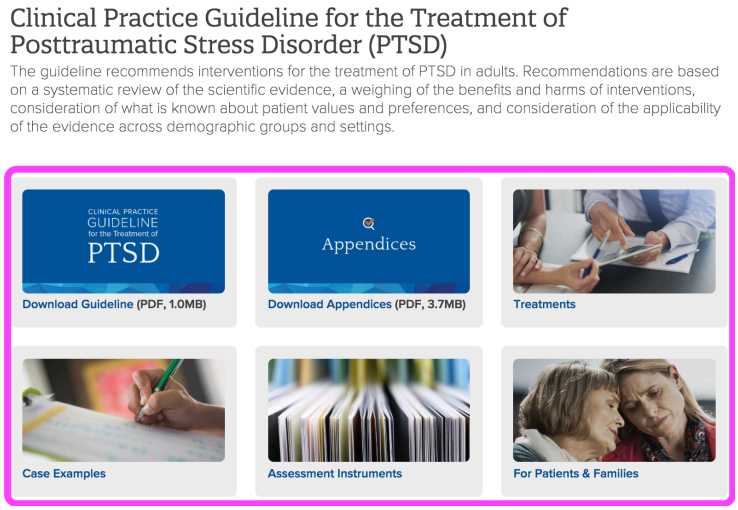
Figure 2. Main webpage with one variant of the experiment (highlighted for clarity). For all variants, a different subheading was tested below the main headline.

Subheadings (and theoretical framework) tested in Experiment A:

Subheading	**Framework/Factor**
[as is, no subheading added]	
Find a treatment supported by the best available research	Trust in scientific experts
Find a treatment supported by science	Trust in scientific experts
Find a treatment endorsed by the APA	Organizational support
Find a treatment to help you take back your life	Gain-framework
Find a treatment to help you say goodbye to symptoms	Gain-framework
Join others with PTSD who have found relief in treatment	Describing norms
You don't have to go through this alone; find a treatment that works	Attitudinal barrier to therapy of wanting to handle problems on one's own

Experiment A objectives:

- Main objective: Box widget link click (clicking any of the boxes/links in the purple outline below)



- Secondary objective 2: Bounce rate
- Secondary objective 3: Session duration

Experiment B: Altering the subheading below main heading on Treatment page
Launched August 23, 2017

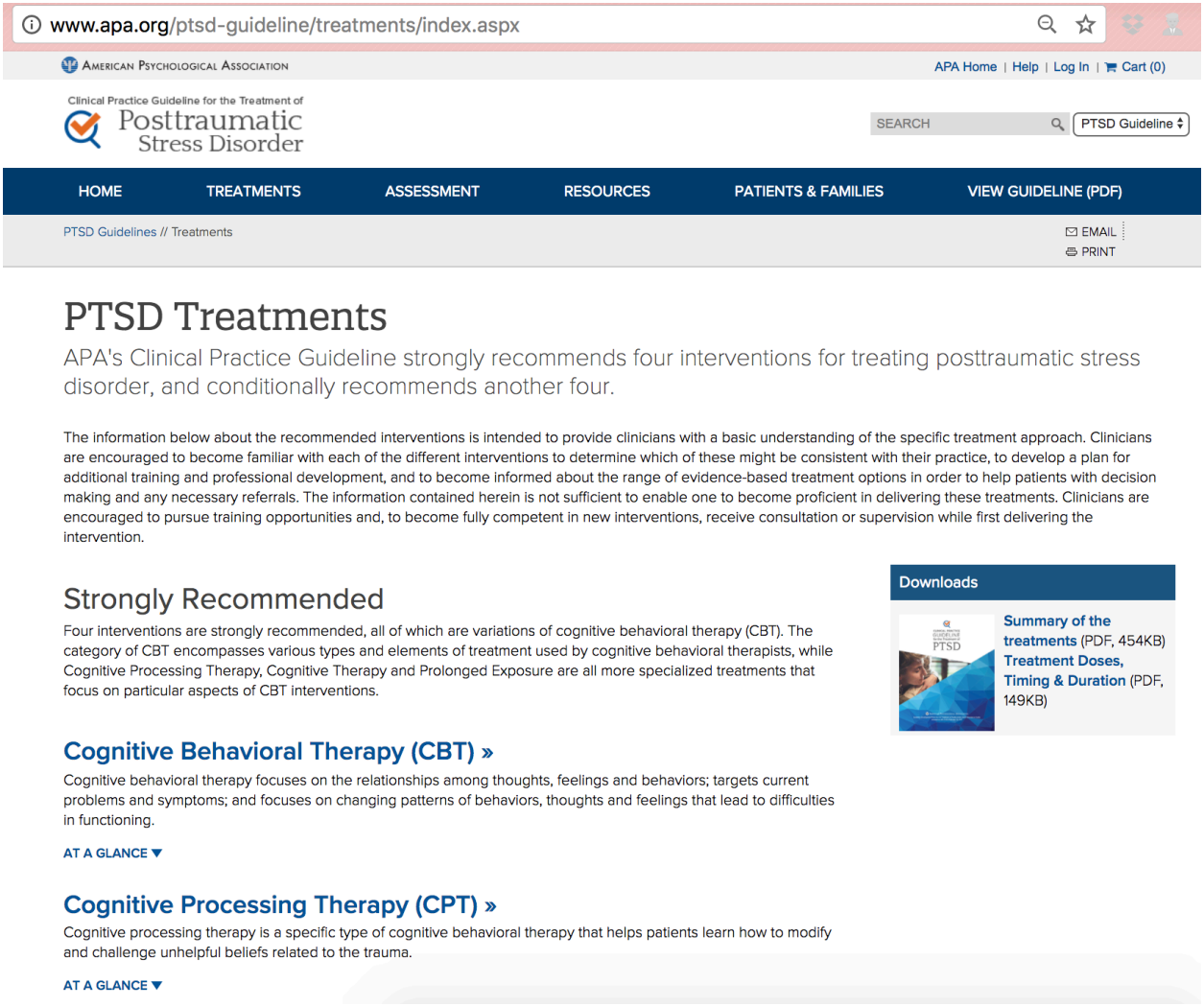


Figure 3. Original version of the PTSD Treatments page

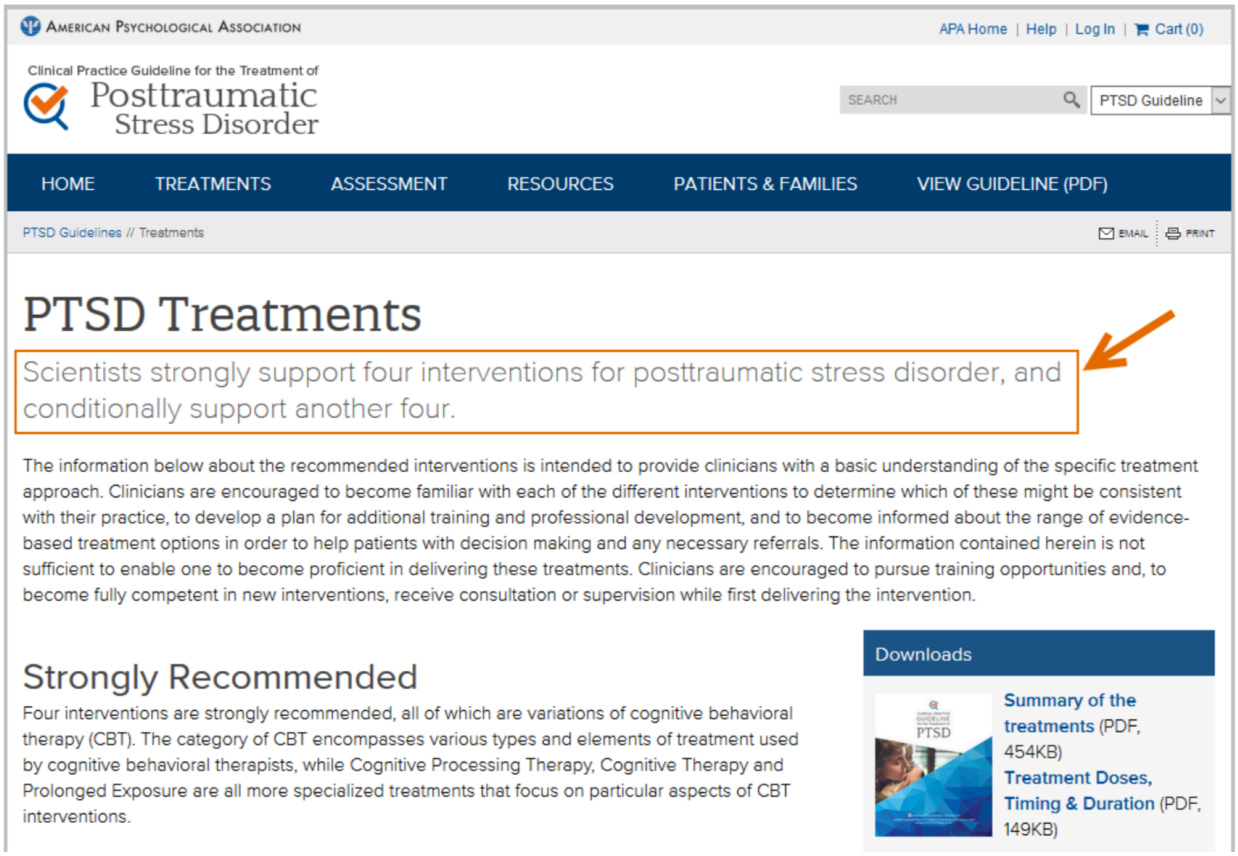


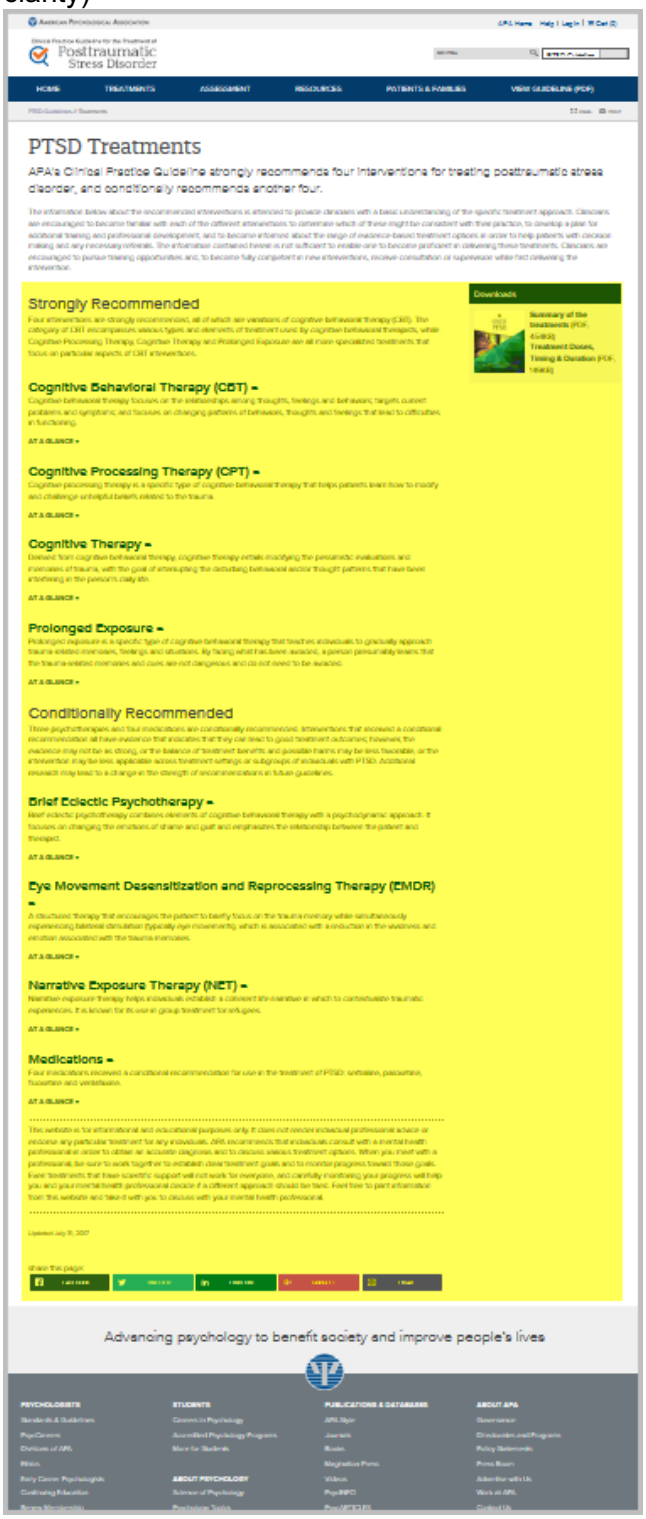
Figure 4. Treatments page with one variant of Experiment B (highlighted for clarity).

Subheadings (and theoretical frameworks) tested in Experiment B:

Subheading	**Framework/Factor**
[Original version]	
Research shows strong support for four interventions for posttraumatic stress disorder, and conditional support for another four	Trust in scientific experts
Scientists strongly support four interventions for posttraumatic stress disorder, and conditionally support another four	Trust in scientific experts
Patients can take back their lives	Gain-framework
Patients can say goodbye to symptoms	Gain-framework
Patients don't have to suffer with posttraumatic stress disorder	Gain-framework
Patients are getting better. Find treatments that work to help you	Describing norms
Those with PTSD don't have to suffer alone	Attitudinal barrier to therapy of wanting to handle problems on one's own

Experiment B objectives:

- Main objective: Clicking any of the links in the yellow section below (highlighted for clarity)



- Secondary objective 2: Bounce rate
- Secondary objective 3: Session duration

Experiment C:
Launched August 23, 2017

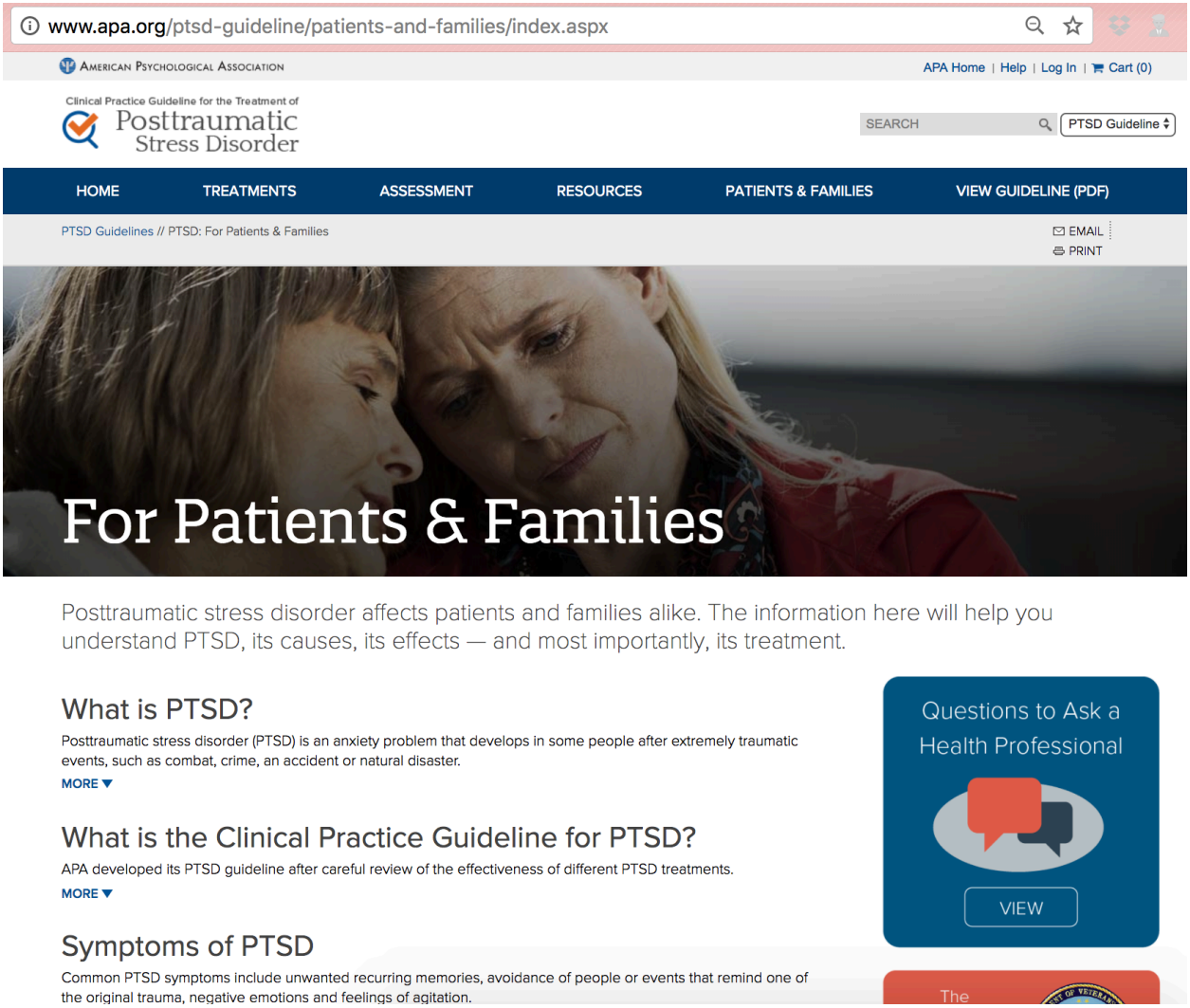


Figure 5. Original version of the For Patients & Families page.

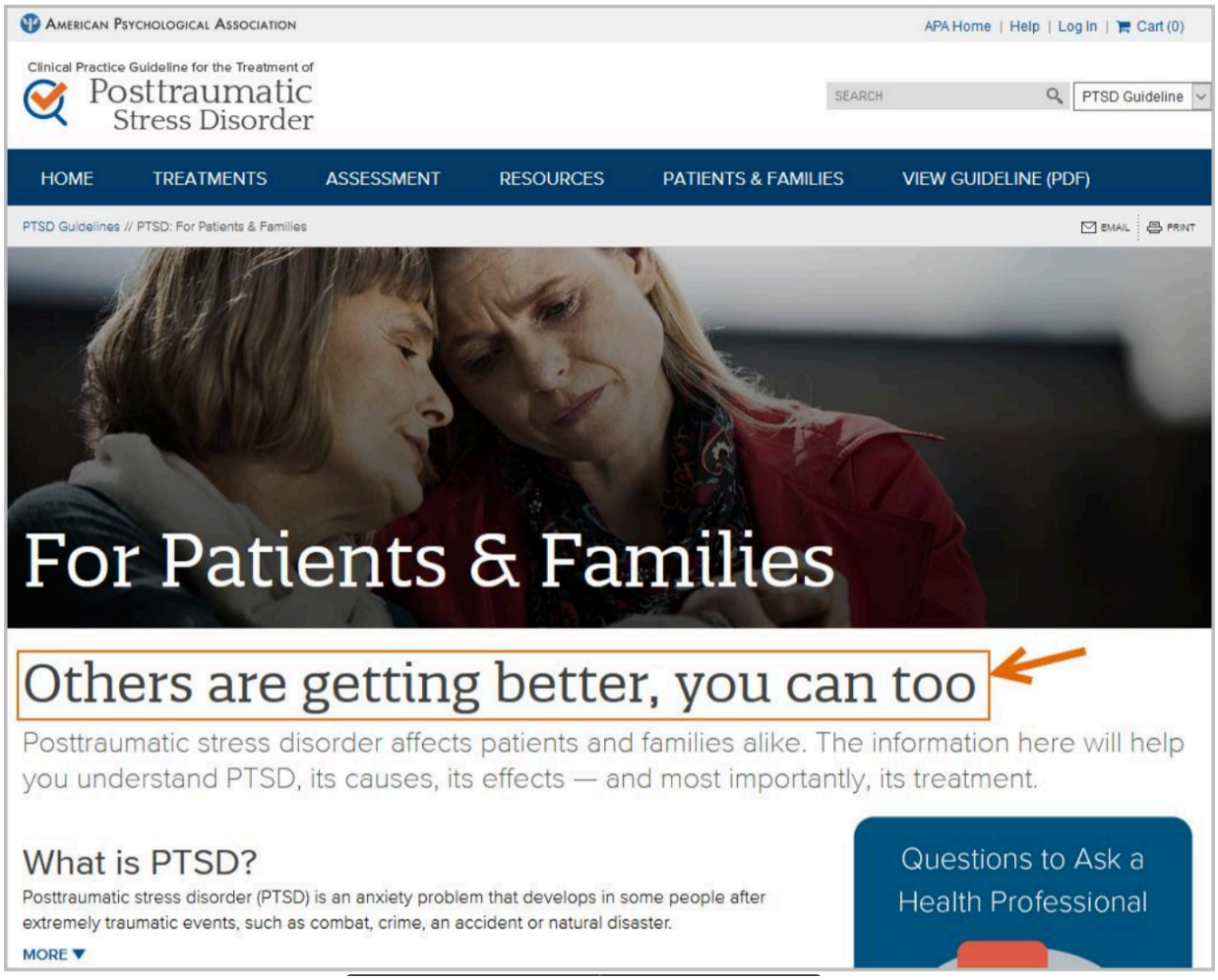


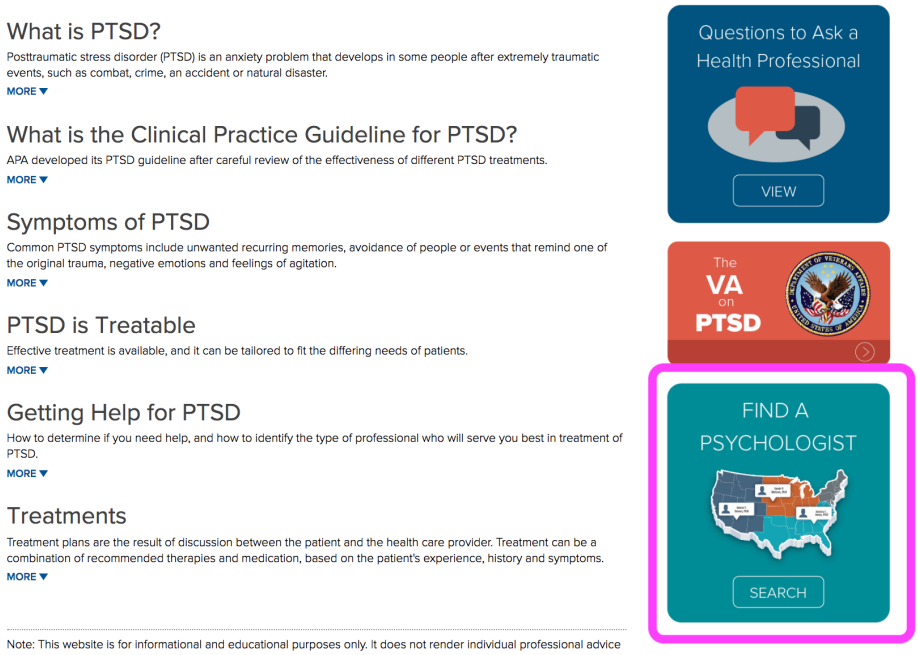
Figure 6. One variant of Experiment C (highlighted for clarity).

Subheadings (and theoretical frameworks) tested in Experiment C:

Subheading	**Framework/Factor**
[Original]	
Treatment works: Feel like yourself again	Gain-framework
Treatment works: Say goodbye to symptoms	Gain-framework
Science says, treatment works	Trust in scientific experts
Research shows, treatment works	Trust in scientific experts
The APA supports these recommended treatments	Organizational support
Others are getting better, you can too	Describing norms
Treatment works: No one has to go through PTSD on their own	Attitudinal barrier to therapy of wanting to handle problems on one's own

Experiment C objectives:

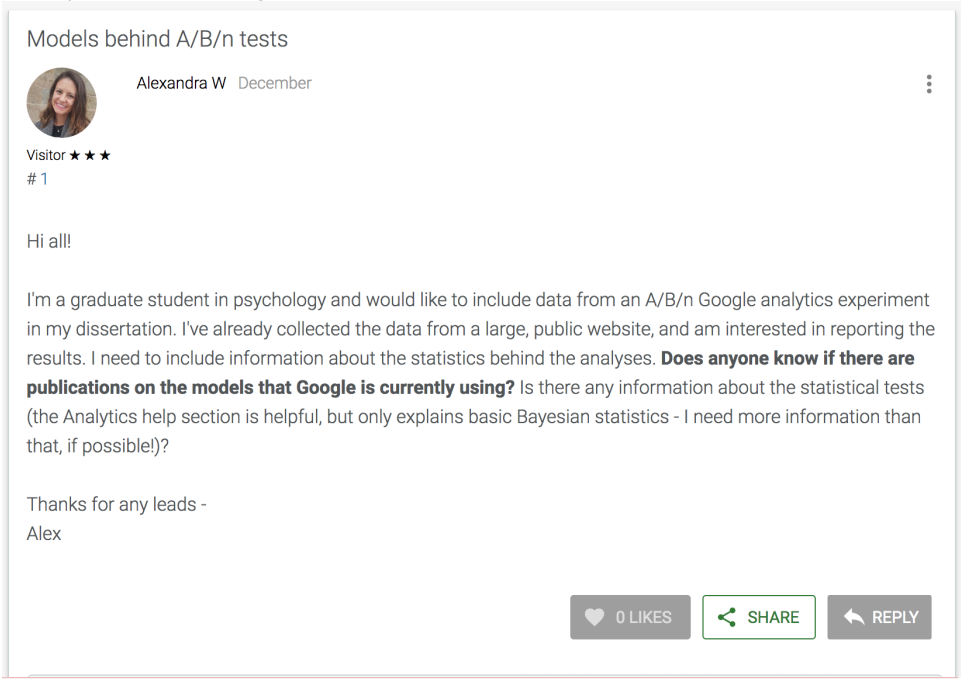
- Main objective: Clicking on the Find a Psychologist image on the right rail (highlighted in purple below)



- Secondary objective 2: Bounce rate
- Secondary objective 3: Session duration

Appendix C. Study 1: Efforts to find information regarding Google Optimize and Analytics

1) Post to Google discussion board



Models behind A/B/n tests

Alexandra W December

Visitor ★★★

1

Hi all!

I'm a graduate student in psychology and would like to include data from an A/B/n Google analytics experiment in my dissertation. I've already collected the data from a large, public website, and am interested in reporting the results. I need to include information about the statistics behind the analyses. **Does anyone know if there are publications on the models that Google is currently using?** Is there any information about the statistical tests (the Analytics help section is helpful, but only explains basic Bayesian statistics - I need more information than that, if possible!)?

Thanks for any leads -
Alex

0 LIKES SHARE REPLY

Re: Models behind A/B/n tests

Robin J December

Follower ★★☆

2

Wow! That is a topic I would have never expected to research myself. Thanks for posting. I am definitely no expert in this field but I have gathered a few links for you that might help you further with the research or discovery process:

- This is Steven L. Scott (Steven L. Scott is a statistician primarily interested in the development and application of Bayesian methods. He received his PhD from the Harvard statistics department in 1998, and served on the faculty of USC's Marshall School of Business until 2007. After a brief stint in banking he joined Google in 2008.) Maybe you can read his papers and find more.
- These are the research papers published by Google. Maybe that will help you further to analyse and answer your related needs.
- INFERRING CAUSAL IMPACT USING BAYESIAN STRUCTURAL TIME-SERIES MODELS : this is a research paper published that has the keywords you mentioned.
- Overlapping Experiment Infrastructure
- Focusing on the Long-term

I hope it helps or at least points you to the right direction!! Good luck with your dissertation.

2) Post to Society for a Science of Clinical Psychology listserv

Published using Google Analytics? Inbox x

Alexandra Werntz <ajw3x@virginia.edu> 9:48 AM (6 hours ago)
to sscpnet

Hi all,

Does anyone on here have any experience publishing (or trying to publish) using data from experiments run through Google Analytics? A piece of my dissertation (I'm a grad student working w/ Bethany Teachman) uses Google's platform to examine how varying text on web pages leads to increased site engagement. However, Google seems to be fairly secretive on their exact algorithms for running the stats, and so we're curious if anyone has had any success publishing results using their platform.

I've dug into Google's FAQ and have a good idea of the Bayesian models behind the algorithms, but just wanted to know if anyone has any more specific information.

Thank you very much for any leads!

all best,
Alex

No helpful responses.

3) Email to Dr. Steven Scott at Google

Dissertation using Google Analytics methods and results Inbox x

Alexandra Werntz <ajw3x@virginia.edu> 3:49 PM (22 minutes ago)
to stevescott, bcc: Bethany

Hi Dr. Scott,

I'm a clinical psychology doctoral student at the University of Virginia preparing to propose my dissertation. Part of my dissertation focuses on an A/B/n experiment on a website using Google Analytics. Although I've gone through the FAQs and help pages, there are very few concrete resources for the exact models. I've seen that you've published a lot on the simulations and models related to the A/B/n tests through Google Analytics (you're cited frequently!), however it isn't clear which of your papers are the ones that I should be citing. Specific questions include, is it possible to learn more about other factors accounted for in the model, in addition to "account time, user context, result consistency, and other factors?" Also, how can I interpret my results when there isn't one clear "winner" out of 7 variants of an experiment?

As you know, students should have a solid understanding of the stats in their dissertation in order to defend the methods/analyses, and I really would love to include this data in my dissertation. However, at this point, I'm worried that by including in the dissertation a comment about how there isn't enough public knowledge about the analytics behind the statistics, I'll be at a disadvantage. Moreover, I would love to be able to publish these results in the near future, and so any cites that would give reviewers more confidence in the methods would be greatly appreciated.

Thank you very much for your time -

all best,
Alex Werntz

Re: Dissertation using Google Analytics methods and results Inbox x

stevescott <stevescott+noreply@autoreply.mail.google.com> 3:49 PM (22 minutes ago)
to me

Steve Scott is no longer with Google. If your enquiry needs a response from the team, please re-send to stevescott-email@google.com.

Note that this email address also bounced.

4) Email to Dr. Botvinick at Google

Dissertation using Google Analytics methods and results

Alexandra Werntz <ajw3x@virginia.edu> 4:09 PM (2 minutes ago)
to botvinick, bcc: Bethany

Hi Dr. Botvinick,

I'm a clinical psychology doctoral student at the University of Virginia preparing to propose my dissertation. Part of my dissertation focuses on an A/B/n experiment on a website using Google Analytics. Although I've gone through the FAQs and help pages, there are very few concrete resources for the exact models. I know that this isn't your area of study, however given you're someone who has straddled both the academic and Google worlds, I wondered if you'd be able to provide any assistance.

Specific questions include, is it possible to learn more about other factors accounted for in the A/B/n experiment models, in addition to "account time, user context, result consistency, and other factors?" Also, how can I interpret my results when there isn't one clear "winner" out of 7 variants of an experiment?

As you know, students should have a solid understanding of the stats in their dissertation in order to defend the methods/analyses, and I really would love to include this data in my dissertation. However, at this point, I'm worried that by including in the dissertation a comment about how there isn't enough public knowledge about the analytics behind the statistics, I'll be at a disadvantage. Moreover, I would love to be able to publish these results in the near future, and so any cites that would give reviewers more confidence in the methods would be greatly appreciated.

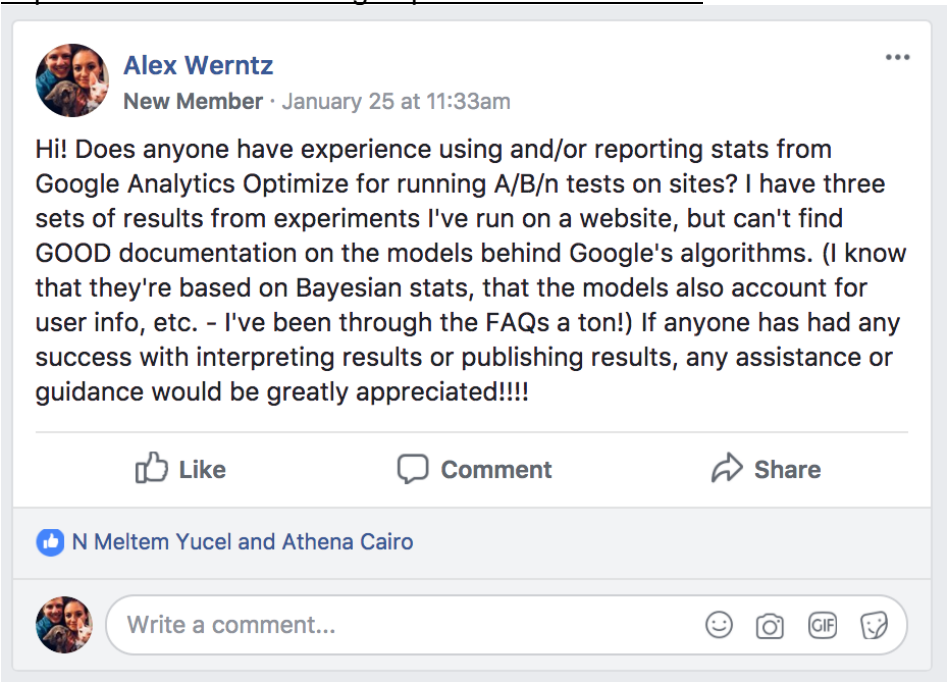
Thank you very much for your time -

all best,
Alex Werntz

Matt Botvinick 9:56 AM (55 minutes ago)
to me

Dear Alexandra -- Thanks for your message. I'm sorry to say that I really don't have any personal experience with this sort of thing, and so don't have much to offer in terms of useful advice. I do wish you the best in pursuing other potential sources of information. Sincerely -- Matt

5) Post to Psychological Methods Discussion Group on Facebook, https://www.facebook.com/groups/853552931365745/



6) Email exchange with Cynthia Tong, PhD in UVA Quantitative Psychology area

Quick Bayesian stats question

7 messages

Alexandra Werntz <ajw3x@virginia.edu> Wed, Feb 14, 2018 at 4:26 PM
To: xt8b@virginia.edu
Cc: Bethany Teachman <bteachman@virginia.edu>

Hi Cynthia,

I'm a 4th year clinical student working with Bethany Teachman and have a (hopefully quick!) question regarding output from Bayesian models.

Part of my dissertation is examining whether seeing different headlines on a website leads users to differentially click on areas of interest. We ran the experiments using Google Optimize, which randomly assigned site visitors to see one of the headlines when visiting the site. Google Optimize uses Bayesian approaches, and includes a lot of different parameters into their models, so I don't have access to everything that is accounted for. However, the output that they provide is credible regions for each of the variants. **I'm curious if there is a way to compare credible regions across variants.** Essentially, if I know that 95% credible region for X does not contain the median of Y, are they "statistically significantly different?"

I've been doing some digging online, but I'm not familiar enough with Bayesian statistics and credible intervals to be confident that I know how to interpret them.

Thanks so much for any insight!!!!

all best,
Alex

Hi Alex,

Are you able to get the credible interval for X-Y? I'm not familiar with Google Optimize, but in Bayesian software, you should be able to get the CI for X-Y instead of CIs for X and Y separately. Then by looking at whether the CI for X-Y covers 0 or not, you should be able to tell whether X is significantly different from Y.

Feel free to let me know if you have more questions. I'm happy to help.

Best,

Cynthia

Oh, interesting - thanks so much! Google doesn't give us the difference, only the credible intervals for each variant... Is there a way to calculate a difference score w/out other information about the models?

Thank you SO much!

Alex

The idea of Bayesian estimation is to sample parameter values from their posterior distributions and then make inferences based on the sampled parameter values. So, the CIs are obtained based on those sampled values. Bayesian software can provide you the sampled values, based on which you can calculate anything. Does Google provide you those values? It probably doesn't give those to you directly, but there might be some option to obtain them.

Cynthia

Thanks so much - unfortunately, Google doesn't give us much of anything, aside from the CIs, Google only gives us the raw conversion rates (in our case the number of times a participant clicks on a part of the webpage we're interested in).

Since we don't have any of the values, my guess is that we can't calculate the difference. I'll just make sure that's clear in my dissertation proposal. Thank you SO much for the help (and sorry for the delay in responding!)

Thanks!
Alex

Appendix D. Study 3: Recruiting flyer

Are you or a loved one feeling anxious?

Seeking adults with anxiety or family members and close friends of an adult with anxiety to participate in a focus group discussion about seeking treatment for anxiety.

This study is conducted by Alexandra Werntz, MA, in the Psychology Department at the University of Virginia.

2 hours of time required after phone screening
Participants receive $25 for participating

For more information, please contact: Principal Investigator Alexandra Werntz, MA at ajw3x@virginia.edu

IRB approved, #XXX

Appendix E. Study 3: Depression, Anxiety, and Stress Scales-Anxiety subscale
Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I was aware of dryness of my mouth.	0	1	2	3
2	I experienced breathing difficulty (e.g,, excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
3	I experienced trembling (e.g., in the hands).	0	1	2	3
4	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
5	I felt I was close to panic.	0	1	2	3
6	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	0	1	2	3
7	I felt scared without any good reason.	0	1	2	3

Appendix F. Study 3: Qualification Survey

Are you or do you know someone who is currently struggling with anxiety?
Anxiety can be characterized by ongoing feelings of stress, frequent worry, extreme fear and avoidance of specific things or situations (like heights, spiders, or public spaces), or fear of social interactions. While all of us experience anxiety sometimes, for some people the anxiety is severe, occurs frequently, and gets in the way of people doing the things they want to do or enjoying themselves. We're asking about that more serious anxiety.

Yes - I am struggling with anxiety
Yes - someone I'm close to is struggling with anxiety
No

Have you been diagnosed with anxiety by a healthcare professional? (*Note, this item was shown if someone endorsed that they were struggling with anxiety, and was added after data collection started, so only two participants completed this item*.)

No
Yes. Type of provider (e.g., primary care doctor, therapist): _____

How is that person related to you? (If you have more than one person in mind, select the person who you would likely encourage to seek treatment.) (*This was only shown to individuals who reported knowing someone with anxiety*.)

Family member
Friend
Co-worker
Other (please describe) _____

Anxiety causes different problems in different people's lives. Based on what you know about your Family member/Friend/Co-worker/Other's anxiety, which of the following statements are true? Select all that apply. (*This was only shown to individuals who reported knowing someone with anxiety*.)

- INTERFERING: The anxiety is interfering with the person's life. It gets in the way of important activities, like work or socializing. Examples might include: someone being too afraid to go to a party for fear of meeting new people, someone being so afraid of airplanes that they drive even for long trips, or someone always taking the stairs because they are so afraid of using an elevator.
- SEVERE: Their anxiety is severe. The person is frequently anxious or scared. They may feel their heart racing, feel short of breath, feel dizzy, tremble, or feel nauseous in anxiety-provoking situations.
- INAPPROPRIATE: Their anxiety is sometimes inappropriate. Sometimes anxiety is normal. Getting nervous in a risky situation may be normal and appropriate (for example, getting nervous before giving a talk to 300 people that determines whether you get a job is appropriate). However, sometimes people can feel anxiety when it is inappropriate or unnecessary, or are unable to get their anxiety under control.
- None of the above.

How old are you? (age in years)

Please indicate your gender.
- Male
- Female
- Other

Please indicate the highest level of degree that you have.
- elementary school
- junior high
- some high school
- high school graduate
- some college
- associate's degree
- bachelor's degree
- some graduate school
- master's degree
- JD
- MD
- PhD
- other advanced degree
- MBA

What is your ethnicity?
- Hispanic/Latino
- Not Hispanic/Latino

Please select your race (select as many as apply).
- American Indian/Alaska Native
- Asian
- Black/African American
- Native Hawaiian/Pacific Islander
- White
- Other _____

What is your approximate annual household income? (US $)
- less than 25,000
- 25,000 - 49,999
- 50,000 - 74,999
- 75,000 - 149,999
- greater than 150,000
- Don't know

Appendix G: Study 3: Handout with Headlines
Imagine you were looking for information about treatment for anxiety online for yourself or a loved one. Below are potential headings for websites or advertisements that would describe information about **cognitive behavioral therapy** (CBT) for anxiety.

Cognitive behavioral therapy (CBT):

- **Typically short-term (8-16 sessions)**
- **Trained therapist**
- **Can include being gradually exposed to something anxiety-provoking, learning ways to challenge negative thinking, and learning how thoughts, feelings, and behaviors interact**

1) CBT works.
2) CBT works: Feel like yourself again.
3) CBT works: Say goodbye to symptoms.
4) CBT works: No one has to go through anxiety alone.
5) Say goodbye to anxiety symptoms.
6) Science says, CBT works.
7) Research shows, CBT works.
8) The American Psychological Association recommends CBT.
9) Others are getting better with CBT. You can too.
10) Others with anxiety have gotten better with CBT.
11) Without CBT, you're still anxious.
12) Without CBT, you're still worrying.
13) People who don't get CBT don't get better.
14) You don't have to struggle with anxiety on your own.
15) Over half of people who get CBT get better. [1]
16) CBT may help with anxiety more than medication. [2]

[1]Loerinc, Meuret, Twohig, Rosenfield, Bluett, & Craske, 2015
[2] http://www.abct.org/Help/?m=mFindHelp&fa=CBT_Or_Medication

Appendix H. Study 4: Demographic Items and Mental Health History Questionnaire

Demographic items collected through Project Implicit

1. Gender: m or f
2. Birth month: January through December
3. Birth year
4. Education
5. Political ideology: strongly conservative to strongly liberal
6. Religiosity: very religious to not at all religious
7. Zip code
8. Religion
9. Race
10. Ethnicity
11. Family income
12. Occupation
13. Country of citizenship
14. Country of residence

Mental Health History

1. Mental health history – edited version of MT's mental health history questionnaire
    a. **Are you *currently* struggling with any of the following mental disorders? Please select all that apply.**
        i. Generalized anxiety disorder (GAD)
        ii. Obsessive-compulsive disorder (OCD)
        iii. Panic disorder
        iv. Agoraphobia
        v. Posttraumatic stress disorder (PTSD)
        vi. Social anxiety disorder
        vii. Specific phobia(s)
        viii. Dementia or other cognitive disorder
        ix. Substance use disorder
        x. Schizophrenia or other psychotic disorder
        xi. Depression
        xii. Bipolar disorder
        xiii. Eating disorder
        xiv. Personality disorder
        xv. Other (please specify)
        xvi. Not struggling with a mental disorder
        xvii. Prefer not to answer
    b. **Have you *previously* struggled with any of the following mental disorders (in other words, did you struggle with one of these in the past and it is no longer a problem)? Please select all that apply.**
        i. Generalized anxiety disorder (GAD)
        ii. Obsessive-compulsive disorder (OCD)
        iii. Panic disorder
        iv. Agoraphobia
        v. Posttraumatic stress disorder (PTSD)
        vi. Social anxiety disorder
        vii. Specific phobia(s)
        viii. Dementia or other cognitive disorder
        ix. Substance use disorder
        x. Schizophrenia or other psychotic disorder

xi. Depression
xii. Bipolar disorder
xiii. Eating disorder
xiv. Personality disorder
xv. Other (please specify)
xvi. Have not struggled with a mental disorder in the past
xvii. Prefer not to answer

c. **Are you currently receiving help for any of the previously listed disorders, or other emotional or psychological difficulty (e.g., couples therapy)? Please select all that apply, or "I am not receiving help."**
    i. **Therapy** (talking with a trained professional)
        1. Examples: psychologist, licensed mental health practitioner (LMHC), school counselor, social worker, marriage and family therapist, group therapist
    ii. **Prescription medications**
        1. Examples: Psychiatrist, medical doctor
    iii. **Seeking social support** (talking with non-professionals)
        1. Examples: Teacher, family member, friend, religious leader, coach
    iv. **Self-guided help**
        1. Examples: Self-help book, blogs, online intervention, mobile applications
    v. **Over-the-counter medications and/or supplements**
    vi. **Other (Please specify)**
    vii. I am not receiving help
    viii. Prefer not to answer
d. **In the past, have you ever received help for any of the previously listed disorders, or other emotional or psychological difficulty (e.g., couples therapy) that you are not currently receiving? Please select all that apply, or "I have not sought help in the past."**
    i. **Therapy** (talking with a trained professional)
        1. Examples: psychologist, licensed mental health practitioner (LMHC), school counselor, social worker, marriage and family therapist, group therapist
    ii. **Prescription medications**
        1. Examples: Psychiatrist, medical doctor
    iii. **Seeking social support** (talking with non-professionals)
        1. Examples: Teacher, family member, friend, religious leader, coach
    iv. **Self-guided help**
        1. Examples: Self-help book, blogs, online intervention, mobile applications
    v. **Over-the-counter medications and/or supplements**
    vi. **Other (Please specify)**
    vii. I have not sought help in the past
    viii. Prefer not to answer
e. Do you have a close family member or friend currently struggling with anxiety? Select all that apply.
    i. Yes, a family member.
    ii. Yes, a close friend.
    iii. Yes, someone else close to me.
    iv. No.
    v. Prefer not to answer.

Appendix I. Study 4: Attitudes Toward Seeking Professional Psychological Help Questionnaire

	Item	Correspondence to Original Version	Scoring
1.	If I believed I was having a mental breakdown, my first inclination would be to get professional attention.	Same as Item 12	S
2.	The idea of talking about problems with a psychologist strikes me as a poor way to get rid of emotional conflicts.	Same as Item 19	R
3.	If I were experiencing a serious emotional crisis at this point in my life, I would be confident that I could find relief in psychotherapy.	Same as Item 23	S
4.	There is something admirable in the attitude of a person who is willing to cope with his or her conflicts and fears *without* resorting to professional help.	Item 24 (change of personal pronoun)	R
5.	I would want to get psychological help if I were worried or upset for a long period of time.	Item 18 (slightly modified)	S
6.	I might want to have psychological counseling in the future.	Item 25 (modified)	S
7.	A person with an emotional problem is not likely to solve it alone; he or she *is* likely to solve it with professional help.	Item 16 (change of personal pronoun)	S
8.	Considering the time and expense involved in psychotherapy, it would have doubtful value for a person like me.	Same as Item 6	R
9.	A person should work out his or her own problems; getting psychological counseling would be a last resort.	Item 26 (change of personal pronoun)	R
10.	Personal and emotional troubles, like many things, tend to work out by themselves.	Item 9 (modified)	R

Note. Straight items (S) are scored 3-2-1-0, and reversal items (R) 0-1-2-3, respectively, for the response alternatives *agree*, *partly agree*, *partly disagree*, and *disagree*.

Appendix J. Study 4: Patient Health Questionnaire - 4

PHQ-4

Over the <u>last 2 weeks</u>, how often have you been bothered by the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Little interest or pleasure in doing things	0	1	2	3
4. Feeling down, depressed, or hopeless	0	1	2	3

Appendix K. Study 4: Screenshots from Headline Rating Questionnaire
Page 1:

Headlines for a webpage

Instructions: On the next page, you will see a website describing a type of therapy for mental or emotional difficulties called cognitive behavioral therapy. You will be asked to rate the page for how appealing the treatment is to you.

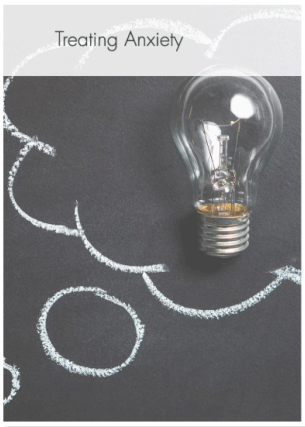
On the following page, you will see different versions of headlines for that page, and we are interested in learning whether adding a headline makes the treatment description more or less appealing. You will be asked to rate each of the headlines.

During this task, please imagine that you are looking for information online about anxiety treatment for you or someone close to you. Please answer the questions below each webpage. There are no right or wrong answers.

Click twice to continue

Page 2:

Please rate how appealing this webpage makes CBT as an anxiety treatment.



Home Treatments Getting Better More Information

Cognitive Behavioral Therapy (CBT)

CBT is a type of psychotherapy that is typically short-term (8-16 sessions) and involves talking to a trained therapist. CBT has been found to be a treatment that works to help people feel better from their anxiety symptoms.

CBT is tailored to fit an individual's needs, but could include:

- being gradually exposed to situations that were upsetting to you (also called exposure therapy)
- learning to challenge your negative thoughts (sometimes involving writing down your thoughts and thinking of new, more balanced ones)
- learning how your thoughts, feelings, and behaviors all interact

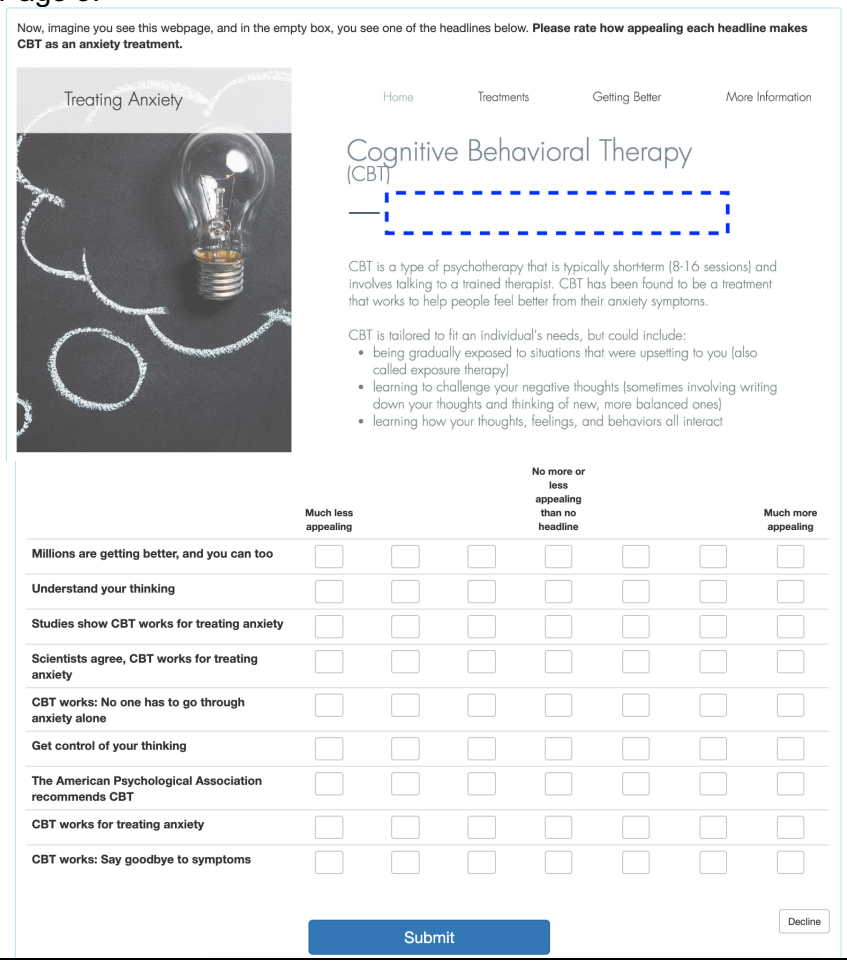
Extremely unappealing
Moderately unappealing
Slightly unappealing
Neither unappealing nor appealing
Slightly appealing
Moderately appealing
Extremely appealing

Selecting an answer once colors it blue.
You can change your answer by selecting another option.
To confirm, click the selected (blue) button a second time.

Submit

Decline

Page 3:



Headline	Framework
1 - CBT works for treating anxiety	Gain framework – highlighting positive consequence of engaging in tx
4 - Understand your thinking	Suggested by focus group member; gain framework – highlighting positive consequence of engaging in tx
5 - Get control of your thinking	Gain framework – highlighting positive consequence of engaging in tx
6 - CBT works: Say goodbye to symptoms	Gain framework – highlighting positive consequence of engaging in tx
2 - Studies show CBT works for treating anxiety	Trust in science/research
3 - Scientists agree, CBT works for treating anxiety	Trust in science/research
7 - CBT works: No one has to go through anxiety alone	Counter to common attitudinal barrier: should handle on one's own
8 - The American Psychological Association recommends CBT	Organizational support
9 - Millions are getting better, and you can too	Descriptive norms