

Cognitive Dissonance and Disaster Risk Communication

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Abstract: Much of effective disaster risk communications practice is based on the equitable distribution of crisis messaging to the target population. Priority is given, for example, to getting an evacuation message to the most people possible using a language and medium appropriate to that audience. Cognitive dissonance (CD) studies, however, show that well-intentioned disaster management messaging not only can produce an undesirable public reaction, but can also solidify public sentiment to resist or deny that very message. This focused literature review of a modest-sized body of research on the effects of cognitive dissonance on disaster management risk communications will produce two results. First, the research will demonstrate that a basic understanding of CD could help

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disaster communicators craft more effective messaging and, second, it will introduce a preliminary cognitive dissonance index (CDI) that can be easily plugged into existing crisis communication models. This “upgrade” to existing risk communication frameworks represents an efficient method to close the theory to practice loop and begin to account for the power of CD in our national and international disaster communications.

Keywords: Risk communication; disaster management; risk analysis; crisis communications; cognitive dissonance; vulnerability index.

1. Introduction

Risk is not created by the occurrence of a flood, hurricane, or other natural or human-made disaster event. “The origins of disaster lie not in nature, and not in technology, but rather the everyday workings of society itself.”¹ Effectively communicating risk to a population directly impacts the number of lives saved and amount of property preserved in a disaster whether it be human-made, natural, fast-onset, or slow. It is generally understood that government has a responsibility to alert and warn the public of impending danger and much effort is expended by those organizations attempting to create messages that the public will act on. The most well-rehearsed and refined risk communications message is ultimately evaluated by the reaction elicited from its audience.

This study defines a *disaster communicator* as a professional (e.g., emergency managers, public officials, or public information officers) who communicates to the public during a disaster or public crisis. These disaster communicators hone their skills with a set of commonly accepted tenets that have been shown to support a favorable public response. Lundgren and McMakin,² whose work is one of the most widely used texts on the topic, demonstrate why risk messaging must be transparent, relatable, simple, straight-forward, and clear.³ The source of the communication must be trusted, and it is vital to engage the public in a dialog — not a monolog. “Audience perceptions and concerns must be considered if risk decisions, and their communication, are to be successful.”² Public communication has evolved from a paternalistic model to the present-day one, where the audience feels it must somehow influence the outcome. This refers to the consensus-building approach and getting the public involved at every level

of risk communication.² It is also vital that crisis messaging accounts for the target population's intrinsic biases.⁴

Barriers to risk communication include an ongoing lack of confidence in government's ability to manage public safety issues.⁵ Expert communication of risk can be met with differing perceptions of authority and result in messaging that is either overly amplified, trivialized,⁶ or skewed depending on a person's experience or availability.¹ Groups within a population can have heightened responses to known communication obstacles as well. For example, a predominant hurdle to evacuation warnings and other crisis communications among minorities is a general distrust of the official government notifications.⁷⁻⁹ Some argue that a deeper understanding of individual and group psychology might advance the state of disaster communications.¹⁰⁻¹³ Bostrom *et al.*¹⁴ submit that a checklist that accounts for audience behavior during specific threats and when exposed to different types of message content does not exist but would be beneficial. Beginning to understand specific psychological traits that govern why people adopt risk messaging would be a powerful asset to the disaster management community.¹² Steckelberg *et al.*¹⁵ went as far as to question whether the nature of risk information was itself an obstacle to an audience making an informed choice. "We suggest that the phenomenon of cognitive dissonance is inherent to risk communication."¹⁵

2. Methodology

A focused, qualitative literature review of relevant work supports this study. It is common in the literature to use a focused review to establish a foundation for a novel concept, a theoretical model, or to encourage future research.¹⁶⁻¹⁸ This approach is like a theory generated from the data, which, in this case, came from the literature review.¹⁹ The central research question of the study was: *How could the awareness of cognitive dissonance's (CD) role in disaster risk communication begin to impact risk communication models?* The process began by harvesting and reading 39 abstracts and conclusions of potentially related articles. Articles that were deemed even "slightly relevant" or "likely relevant" were read completely for further assessment.

Next, only 18 core, peer-reviewed articles were retained for being significantly relevant to this subject matter. This indicates a scarcity of direct research on this topic. Articles that touched upon cognitive dissonance but,

for example, revolved around eating disorders or high cholesterol were generally eliminated. Finally, the 18 core articles expanded the list of citations by, first, searching those core articles' citations to look backward in time for additional relevant sources and, second, looking more recently at where those core works had themselves been cited. Three citations were added outside of this matrix to support the use of a focused literature review for this type of study. With five expert book author additions, this resulted in a total of 50 citations (see Figure 1).

The core literature was largely responsible for identifying prevalently discussed factors that could overcome the negative effects of CD on risk communication and therefore be a plausible part of the proposed cognitive dissonance index (CDI). Once more than two peer-reviewed citations referenced a factor like this, it was considered by the authors for inclusion in the proposed CDI. Initial keyword searches included the phrases or words cognitive + dissonance, risk+communications, and/or disaster(s), and/or crisis alternated in various Boolean arrangements but generally with the term *cognitive dissonance* as the lead. Examples of databases accessed through a university library included Academic Search Planner, ProQuest

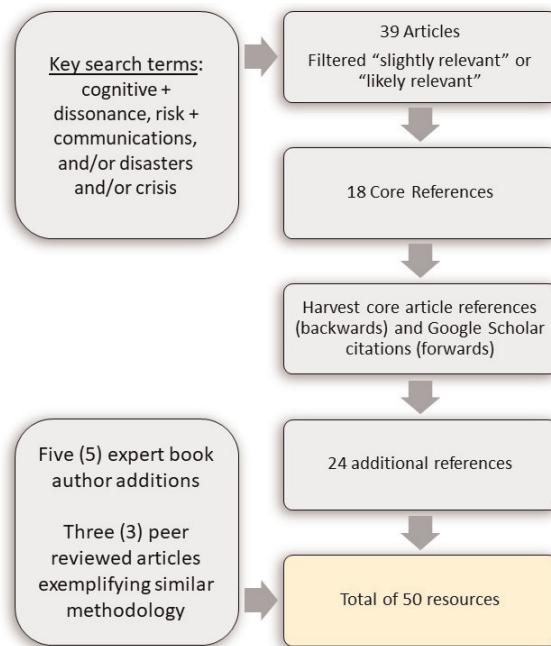


Figure 1. Methodology workflow.

Central, and Emerald Intelligence. Google Scholar was primarily utilized to see where the core articles had been cited, but also to double-check a university search engine for maximum results.

3. Focused Literature Review

3.1. Overview

Festinger²⁰ introduced the theory of cognitive dissonance asserting that human beings tend strongly toward consonance (i.e., normalcy or congruence) and resist dissonance, or that which is psychologically uncomfortable. “When dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase the dissonance.”²⁰ This study suggests that instead of simply improving known and accepted qualities of risk communication prevalent in the science, like transparency and accountability, researchers must explore and include influential cognitive factors at all levels of risk communication frameworks.^{21–23}

Akerlof and Dickens²⁴ felt that the potential impact of CD on the field of economics was so great that they produced a matrix of CD factors to operationalize its influence in that sector. Harmon-Jones *et al.*²⁵ added the term *generative cognition* which became known in the science as an individual’s cognition that is most resistant to change of behavior, attitude, or even a future commitment, while Fischer and Greitemeyer²⁶ reframed CD as a basis for an individual’s selective exposure. This supporting concept of selective exposure is the center point of a literary discussion on the need for accuracy when receiving information — coined the “accuracy motivation” of the audience.^{21,26,27}

Several other studies suggest that another vital component of CD related to successful communications is fear. Introducing a reasonable degree of fear into a message can stimulate audiences to look beyond their personal dissonance.^{13,22,28–30} “The higher the fear and the more concrete, effective, and doable the recommendation, the more likely it is that people will comply. But research has also shown that if you scare the hell out of people and fail to provide them with all three of those factors, then fear will produce denial.”²⁸ This same study by Aronson²⁸ suggests that audience dissonance is correlated with the timeline of the communicated fear. The shorter the timeline, the less audience dissonance occurs. The longer the

timeline, the more dissonance. Renn and Levine⁶ suggest that there is a direct correlation between the intensity or level of commitment to a person's attitude or values and the potential level of dissonance that occurs when receiving facts. Deeper seeded values can create higher levels of dissonance.⁶ "When reality clashes with our deepest convictions, we'd rather recalibrate reality than amend our worldview. Not only that, but we become even more rigid in our beliefs than before."⁹

3.2. Applying Cognitive Dissonance

Timar *et al.*³¹ found that cognitive dissonance masked danger or warnings when people were attracted by conflicting opportunities (e.g., low-priced housing in a flood or earthquake zone). This same study found that perceptions of risk from previous hazards diminished over time. "This pattern is consistent with predictions of the cognitive dissonance approach and/or of the existence of amnesia bias or optimism bias."³¹ Indeed, lack of historical context is difficult to overcome in messaging or in policy. Depoorter³² found that CD could eliminate low-probability threats from public consideration, thereby excluding them from mitigation policy as well. Hatori *et al.*³³ cite the differences in language used by disaster policymakers and their audience as a key component of CD. Although both parties "communicate with each other concerning the same management issues, they recognize these issues using different language".³³ Nigg and Mileti³⁴ added that varying degrees of public dissonance could result in the face of disasters. These included when the public grew accustomed to the threat over time, unfounded public optimism clouding risk perception, and the most acute form of CD which is outright denial of risk. Similarly, Farber³⁵ considered CD a root cause for ignoring low-probability, high-risk events and labeled this a function of probability neglect that resulted in *disaster blindness*. "Before the BP Oil Spill, officials and industry actors also argued that the risk of a major blowout was too small to be a concern with respect to deep water drilling."³⁵ In this example, CD facilitated the plausible impossibility of such a disaster and allowed those who could have foreseen such an event to maintain their professionally responsible self-image.³⁵

Kahan and Braman¹⁰ discuss the need for identity affirmation opposite a difficult public communications issue like gun control. In this scenario, these researchers suggest a bounty (tax rebate) for individuals who register their handguns voluntarily. "A bounty of this sort would affirm the cultural

identities of both gun control supporters and gun control opponents simultaneously because both could see it as an effective and fair collective action problem.”¹⁰ Kahan¹¹ viewed the practical implementation of cultural cognition concepts within the science of risk perception as a path toward more sound public policies relating to diverse populations.

A review of behavioral theories related to risk perception by Shreve *et al.*²² concluded that multi-hazard response theory should consider cognitive factors like risk perception in its modeling. One such disaster-related study that used CD as a foundation to derive an actionable model was Ref. 36. These researchers conducted a mixed-methods investigation across 64 districts in Bangladesh and uncovered three distinct factors rooted in cognitive dissonance theory that impacted attitudes in disaster management supply chain communications and logistics. These predispositions included Professional Growth, Administrative Conflict, and Political Biases.³⁶ While these factors may not be directly related to disaster communication, it is notable for the purposes herein that these researchers employed the theory of CD to generate a practical matrix that could positively influence their study focus of supply chain efficiency.

Multiple studies do indicate that CD-based dispositions like this can be mollified with crisis messaging that is presented as a scenario or framed as a story.^{37–39} Additionally, when crisis messaging encourages even the slightest audience participation, dissonance is reduced, and adoption rates of the message increase.^{2,3,12,25} One can begin to imagine the positive impact of combining CD factors — like framing a risk communication into a story that also asks the audience to participate in some way.

Typical disaster warnings recommend actions that outline an approaching event that is out of our control with recommended actions (e.g., boarding up windows or evacuating) that are resource-intensive. Most residents’ first reaction will be to resist, deny, claim immunity, and then seek out even less-credible sources of information that confirm their reaction or bias.¹³ The development of disaster mitigation messaging receives far less attention than the response-centric focus of treating harm once it has arrived. “The focus is more on maximizing the infrastructure than on message content or how that content is likely to be received by the public.”¹³ Applying psychological CD research directly to the context of crisis communications may not be as simple as cutting and pasting concepts from one field of study to another. Renn and Levine⁶ maintain that public risk

perceptions can vary widely from those found in professional analysis. “Risk communicators have to face the institutional problems of coping with the new change of stochastic reasoning and at the same time with the intrinsic conflict between the perspectives of the scientific community and the public in general. Both reasons justify the already established practice to isolate risk communication from other forms of communication and to treat it as a separate entity.”⁶ Furthermore, programs and resources that focus on disaster risk reduction (DRR) through insight from the psychological community could have a noticeable positive impact on loss prevention — including the loss of lives.¹²

4. Discussion: Actionable Factors from Cognitive Dissonance

Disaster researchers should continue to explore audience-based research that produces tangible, applicable data that can be used by emergency managers and government agencies.²³ According to Vermeulen,¹³ the attempts to model factors like cognitive dissonance to close the theory to practice loops for emergency managers have failed. Framework like the *Conflict-Theory Model of Emergency Decision-Making*⁴⁰ or the *Protective Action Decision Model*⁴¹ “results in complexity that makes each theory virtually impossible to actually apply in crafting a specific warning”.¹³ The aim of this paper is to explore where the influence of CD has the greatest impact on known risk perception factors to create a more effective and practical guide for disaster communicators. The resultant CDI (see Figure 2) will allow disaster managers to connect their risk communication standards to the science on CD in a meaningful and approachable manner. The CDI factors shown in Figure 2 are subsequently expounded in the remainder of this section. Each of these index factors was derived from the cited literature and they presented themselves as plausibly influential when more than two peer-reviewed works included them. Subsequent comparison of each factor to the known literature on CD led to the five most dominant risk communication influencers for this initial study to focus on.

4.1. Storytelling

Scenario modeling is a type of storytelling method that brings together multiple stakeholders with differing backgrounds. This approach does not

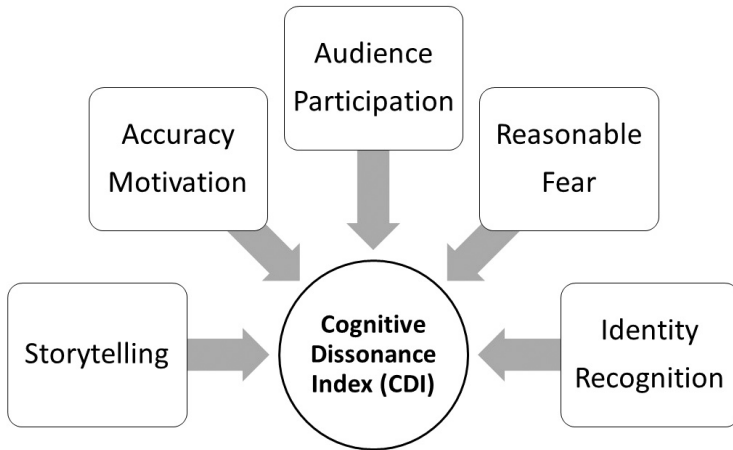


Figure 2. Preliminary CDI for disaster risk communication applications.

attempt to produce a single prediction or outcome but aims to show several substantiated possibilities which can be more relatable to a diverse community. “Articulating possible futures in narrative format makes the abstract issue of climate change into concrete examples that are place-based and meaningful to the participants.”³⁹ For example, the Climate Change Scenario Planning Project (CCSPP), a scenario planning case study from Alaska, embraced the diverse community, differing knowledge levels, and the inherent uncertainties of climate change in its communication methods.⁴² “Because each group of participants arrived at these ideas independently, without the influence of the scientists or organizers, they had a sense of ownership to the stories and scenarios that were created.”³⁹ While this example relates to the effects of climate change, the principles demonstrated are readily applicable to slow- or fast-onset disasters.

Jones and Song’s³⁸ research emphasizes the “importance of stories in shaping cognitive patterns about policy issues”. Relating strongly to cognitive dissonance, this study concluded that the story behind the message is as important as the content of the message itself. Combining the structure of the message (i.e., story frames or models) with the body of knowledge surrounding cognitive reasoning would allow messaging sources to tap into the power of storytelling.³⁸ Modern technology allows for robust visual storytelling, which allows the audience to see the story as it is being explained. The Weather Channel now routinely uses visual displays of storm surge when discussing the topic as part of hurricane messaging,

allowing the audience to visualize storm surge engulfing a home and personal property.^{43,44} Scenario modeling and story narratives get to cut to the front of the line in terms of the sources of information the audiences favor. "Narratives seem to offer intrinsic benefits in each of the four main steps of processing information: motivation and interest, allocating cognitive resources, elaboration, and transfer into long-term memory."³⁷ The power of the story or scenario model opposite the power of CD should alert disaster communicators that disseminating facts in a timely manner will only be as effective as the story delivering the information. Combining the content and facts of a risk message with a locally relevant storyline could help quiet an audience's inherent dissonance and improve overall message adoption.

4.2. Accuracy

When a government source of information elicits confidence from residents, preparation rates are higher. Conversely, when government is considered an inaccurate or untrusted source, people tend to prepare less.⁵ Fischer and Greitemeyer²⁶ found CD was the basis for what they termed *selective exposure* to risk information. Selective-exposure theory maintains that people prefer information that is consistent rather than inconsistent with their existing set of decisions or choices. These researchers posited that the most important means to mitigate selective exposure was by addressing the audience's "accuracy motivation" at the initial phase of communication. If that first risk communication volley does not bring a high level of perceived accuracy with it, the audience is likely to seek alternative sources of information, at which point, reducing CD becomes even more difficult.^{21,26} "Accuracy motivation can be defined as a drive to attain objective, unbiased standpoints and decisions. Several studies show that accuracy motivation can reduce the selective-exposure effect when processing decision-relevant information."²⁶

Furthermore, multiple studies have demonstrated that when communications or circumstances dictate that an outcome (e.g., the hurricane made landfall, but the community was safe) is involved then the need for accuracy is heightened. "Outcome-relevant involvement has been shown to foster accuracy concerns and objective processing of available evidence."²⁷ Messaging accuracy in this context, which directly impacts an audience's accuracy motivation, might encourage a disaster manager to weigh the

speed at which a communication is disseminated to the public opposite the accuracy of the content. Disaster communicators are taught that if accuracy is not achieved, they can “own it” and appear more transparent in the process. However, if accuracy is treated as a secondary goal to releasing information quickly (especially at the beginning of a crisis), then CD and the theory of selective exposure indicate that the audience will not tune in for the communicator’s follow-up.

4.3. Audience Participation

Ter Huurne and Gutteling³ discuss multiple studies that find a strong correlation between risk perception and self-efficacy which is a person’s judgment of how effectively they can follow a recommended course of action. These researchers concluded that a key to improved communication is creating an actionable foundation to the message. “Risk information provided to the general public should combine messages highlighting possible threats or potential outcomes with the promotion of recommended protective action or preventive behaviors.”³ Recommended actions that include “participatory processes” not only will result in a higher rate of message adoption, but will also increase the audience trust in the source of the message.¹²

Harmon-Jones *et al.*²⁵ demonstrated through their own work and a review of the literature on cognitive dissonance that individuals prompted to take some level of action tend to simultaneously reduce dissonance. This finding adds substance to the commonly taught risk communication tenet that the audience should be included in some task or action (e.g., check in with your elderly neighbors) that allows them to feel like they are actively participating in the solution.^{2,12} A critical takeaway, however, is that action must be consistent with the crisis communications content if the goal is to reduce dissonance within the audience.²⁵ Practically speaking, an emergency spokesperson would not want to, for example, center their message on sheltering in place and then end their message by asking people to come to a community center for more information. This type of inconsistency will create dissonance that immediately leads people to seek alternate information sources while dramatically increasing the likelihood that they will take the opposite action requested of them. If the message is to shelter in place, then including an action (no matter how small) that the public needs

to take that reinforces sheltering in place will ultimately produce a higher rate of message adoption.

4.4. Reasonable Fear

Risk communications that elicit an emotional response (e.g., fear or dread) more effectively influence personal risk perception, improve preparation rates, and encourage discussion about the content of the message.^{22,29,30} “Empirical evidence suggests that perceptions of risk are strongly associated with the degree to which a hazard evokes feelings of dread.”²⁹ Donahue *et al.*⁵ found that a threat at a personal level (something that may be eminent and in your own backyard) promotes individual preparedness more so than something that is framed as being further away. Vermeulen¹³ contended that a primary component of disaster warnings should include modestly scaring the audience to help counteract the potential negative effects of cognitive dissonance. “The emergency professional’s task here is not simply to scare people about the impending event, but to add weight to the benefit side of the analysis in order to convince residents that as unpleasant as the protective action is definitely going to be, the cost of not doing it is likely to be even worse.”¹³ Dunlop *et al.*²⁹ agree with this contention, adding that a lowered perception of risk produced by cognitive dissonance could be countered by appealing to personal feelings of vulnerability.

The disaster communicator’s takeaway here is not simply to scare an audience to gain its attention but to strategically and reasonably add fear to a message to direct the audience to the lesser of two less-than-ideal choices. As Vermeulen¹³ indicated, risk messaging may involve “unpleasant” options (e.g., evacuating to a safe location instead of riding out the storm) but using fear to direct an audience to the safer and “less-unpleasant” option could be an effective tool. It is important to note here that while multiple studies confirmed the efficacy of fear in shaping a person’s attitude and actions, those same studies pointed out that anger had the opposite effect.^{45,46} This is a caution sign for a disaster communicator to not overplay the fear component.

4.5. Identity Recognition

Disaster communicators are taught the importance for crisis messaging to account for the cultural and ethnic composition of the community being

served.² Among minorities, for example, one of the most significant barriers to adherence to evacuation warnings and other crisis communications is a disproportional distrust of the official government notifications compared to other populations.^{7,8} Others warn that stereotyping communities based on their background or color of their skin is a dangerous tenet to blindly embrace as a disaster communicator. "The diversity of a community does not account for its collective lack of ability to trust. Instead, it is the inequities and inherent vulnerabilities of that community that are to blame."⁴⁷ Robust data and research, however, are widely available for specific communities, like Latinos, who tend to inherently evacuate and process warnings differently based on their cultural background.^{2,8,48-50} Yet, the comprehensive study of Eisenman *et al.*⁸ (cited over 300 times according to Google Scholar) on this topic concedes that their research was limited by not considering cognitive dissonance factors as well.

"Empirical data that contradict one's prior belief is likely to be especially pronounced when that belief is strongly connected to an individual's cultural identity, for then the forces of cognitive dissonance avoidance that explain biased assimilation are likely to be most strongly aroused."¹⁰ This example demonstrates that if an individual's identity (cultural or otherwise) is affirmed rather than dismissed or diminished, then facts communicated by an official source will be accepted more readily.¹⁰ For a disaster communicator, this is about knowing, not only simple facts like a table displaying demographic breakdown, but also the aggregate culture and values of the diverse community that is being served. The idea of identity recognition enhances the concept of "knowing your audience" by encouraging a deeper understanding of that audience as those values might make the difference between message resistance and message adoption. To further this idea of cultural and identity-related cognitive dissonance, Kahan's study¹¹ related to risk perception concluded that having the overarching goal of bombarding the target population with information can be highly counterproductive when it threatens the audience's cultural identity. "Don't try to convince people to accept a solution by showing them there is a problem. Show them a solution they find culturally affirming, and then they are disposed to believe there really is a problem in need of solving."¹¹ Applying this CD layer of identity recognition has the potential to broaden a disaster communicator's understanding of its audience while helping to

avoid overly simplified stereotypes for vulnerable population message targeting.

5. Conclusion

This focused review of the literature on cognitive dissonance and risk communication yielded two primary results. First, the literature revealed a highly plausible and influential connection between the theory of CD and the study of crisis messaging within the field of disaster management. Second, this research found common factors within this concentrated body of literature that could facilitate the uncomplicated adoption of CD principles by disaster communicators within their existing communication frameworks. Disaster management is a multi-disciplinary field of study.⁵¹ Therefore, the comprehensive efficacy of its policies is reliant on crossing silos of thought to build more effective disaster response, recovery, mitigation, and planning. “Enlisting a psychologist or other mental health professional to work with an emergency response organization not only may help to address distress after traumatic events occur, but also could act as a kind of force multiplier to help staff prevent or mitigate exposure in the first place, which benefits everyone.”¹³

A limitation of this study is synonymous with its importance. There is a current lack of empirical data supporting the impact of CD on crisis communications. Aside from introducing the first CDI of its kind that accounts for the presence of cognitive dissonance in risk communication frameworks, this study is calling upon the psychological, sociological, and disaster management communities to provide more robust (but actionable) cognitive dissonance data for disaster communicators. With the increase in frequency and intensity of natural disasters from climate change, a deeper understanding of cognitive dissonance applied to communicating with the public in a crisis will carry the potential of saving more and more lives each year.

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