Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Review

Cause and effect: On the antecedents and consequences of conspiracy theory beliefs

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Abstract

Since 2008, hundreds of studies have been published about conspiracy theories, many of which were in reaction to the COVID-19 pandemic. These studies are often motivated by concerns about the influence of exposure to conspiracy theories on beliefs, and the impact of conspiracy theory beliefs on behaviors. Numerous studies identify supportive correlations, concluding implicitly or explicitly that exposure causes belief and that beliefs subsequently cause behavior. We argue that while these causal relationships may exist, such conclusions currently lack robust evidence. We present an alternative model of the relationship between exposure, beliefs, and behaviors that accounts for other potentially causal factors and pathways. We encourage further work into the causal effects of exposure to, and beliefs in, conspiracy theories.

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Introduction

Even though researchers invested heavily in identifying the psychological *antecedents* of beliefs in conspiracy theories from 2008 to 2019 [1], efforts to specify the consequences of conspiracy theories were sparse until the COVID-19 pandemic [2], when hundreds of associations were identified between exposure to conspiracy theories, beliefs in conspiracy theories, and non-normative behaviors [3]. Much of this literature puts significant causal weight on exposure to conspiracy theories when explaining beliefs in those theories, and on beliefs in conspiracy theories when explaining non-normative behaviors [4].

While the veracity of the associations identified in the literature is not in question, many studies suffer from limitations that affect how those associations should be interpreted. First, most studies in the past two years rely on observational, cross-sectional——that is, correlational——evidence and, therefore, cannot illuminate causal relationships (for a review and exceptions, see Ref. [3]). Second, many studies model exposure to conspiracy theories as exogenous to beliefs in those conspiracy theories, or model beliefs in conspiracy theories as exogenous to non-normative behaviors, when both exposure and beliefs might be endogenous to what they are intended to explain. Third, many studies fail to properly account for how individuals' underlying psychological, social, and political motivations simultaneously interact with or affect their information environments, beliefs, and behaviors.

A competing body of literature challenges the presumption of causal linkages, arguing that individuals' predispositions, worldviews, and identities often predict their exposure to conspiracy theories [5], their willingness to believe conspiracy theories [6–8], *and* their behaviors [9], simultaneously. Here, we review these different perspectives in the literature, arguing that beliefs and behaviors are the outcomes of complicated and multifaceted processes that defy simplistic causal explanations and that researchers should consider alternative causal pathways in explaining conspiracy theory beliefs and non-normative behaviors.

The correlates of conspiracy theory beliefs

The psychological and informational correlates of conspiracy theory beliefs

Numerous characteristics are correlated with, and *potentially* causal to, specific conspiracy theory beliefs [1]. Most importantly, a stable worldview——commonly referred to as conspiracy thinking or conspiracy mentality——appears to predispose people to such beliefs [10], with high levels being associated with more conspiracy theory beliefs. Socioeconomic characteristics (such as

income [11]) and particular attitudes (such as Manicheanism [12]) also tend to be associated with *the number of* conspiracy theories one believes. Group identity and related factors, such as partisanship [13], tend to be associated with *which* specific conspiracy theories one believes. Personality characteristics, such as dark triad traits, are also correlated with beliefs in some conspiracy theories [8]. While some short-term factors are associated with the adoption of conspiracy theories (e.g., emotional [14] and environmental conditions [15]), much of the literature links conspiracy theory beliefs to entrenched, durable factors [1].

That said, during the pandemic scholars often focused on social media exposure because limited editorial controls have allegedly allowed conspiracy theories to flourish online [4,16,17]. Most importantly, studies often find that the use of social media containing conspiracy theory content is correlated with conspiracy theory beliefs [4,18].

Within this emerging literature is a tendency to put significant causal weight on exposure and beliefs, presuming causal relationships based on correlations. For example, some studies claim that "unregulated social media may present a health risk" [17], and is "one of the larger threats to human well-being" [16] because "social media radicalizes beliefs," and translates those beliefs into "real-world action" [4]. Some researchers have, therefore, called for policy action on the part of "scientists and regulators" [16], and for social media platforms "to be more aggressive in downgrading, blocking, and counteracting" conspiracy theories [19]. In other words, one's perspective on the causal relationship between conspiracy theory beliefs, exposure to conspiracy theories, and non-normative behaviors has tangible downstream consequences for policy recommendations.

Altogether, in terms of the potential causes of conspiracy theories, there are differing views within the literature. On the one hand, a large body of evidence suggests that conspiracy theory beliefs are best accounted for by durable predispositions, worldviews, and identities [1], which predate the adoption of specific beliefs [8]. Such a perspective tends to put less weight on random exposure as the explanation for conspiracy theory beliefs or associated behaviors [6,7]. On the other hand, many recent studies conceptualize conspiracy theories like a virus (e.g., an *info*demic), which spreads from person to person [20], starting with exposure [21], which then leads to beliefs and behaviors.

The behavioral correlates of conspiracy theory beliefs

Extant studies demonstrate correlations between conspiracy theory beliefs and a range of intentions and behaviors [22], including support for political violence [23] and criminal behavior [24]. During the COVID-19 pandemic, conspiracy theory beliefs were found to be associated with many deleterious behaviors, including stockpiling weapons, eschewing social distancing, and vaccine refusal [3,25,26]. While some of this work uses experimental or panel designs, much is of it is cross-sectional or correlative [3], leaving open the possibility that conspiracy theory beliefs are more endogenous than exogenous to unsettling behaviors.

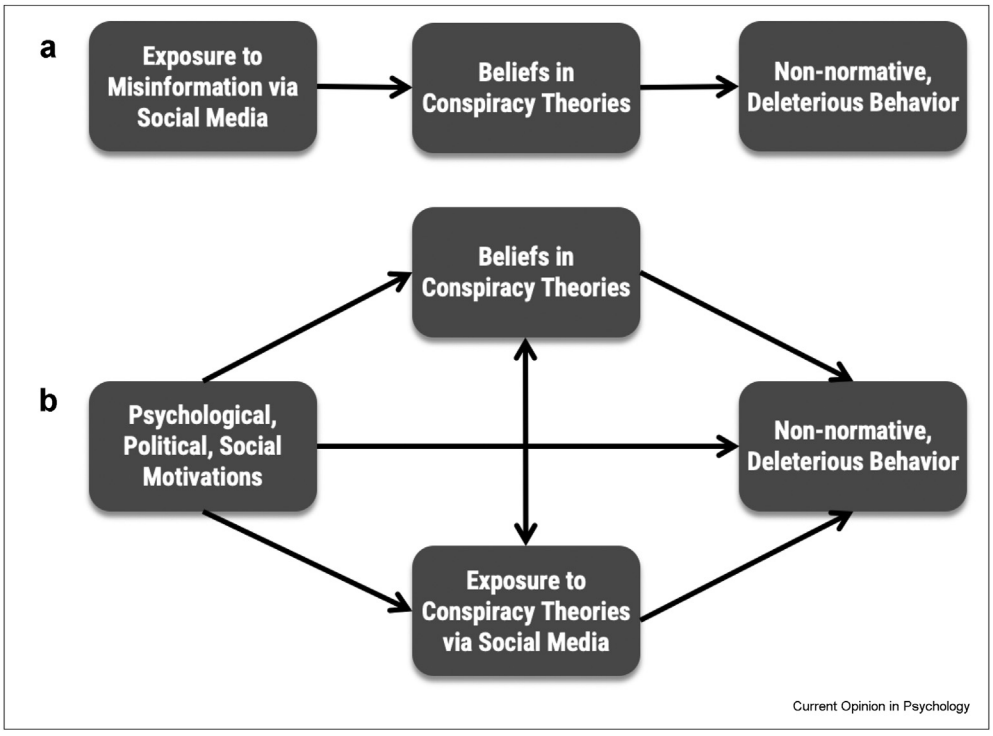
In short, the literature demonstrates correlations (1) between social media use or the use of particular media sources and conspiracy theory beliefs and (2) between beliefs in specific conspiracy theories and particular behaviors. This has led to the assumption, depicted as Model A in Figure 1, that exposure promotes belief, and that belief, in turn, promotes deleterious behaviors [4].

An alternative model of conspiracy theory beliefs and non-normative behaviors

A competing strand of literature suggests that Model A is either missing critically important causal factors or precluding crucial causal pathways. Model B in Figure 1 accounts for these factors and potential causal pathways and, in doing so, is more congruent with longstanding bodies of research into belief formation and media effects. In this model, behaviors are motivated primarily (but not exclusively) by psychological, social, and political predispositions and characteristics, which simultaneously shape exposure to conspiracy theories and the formation of specific beliefs. Hence, Model B puts less weight on exposure, and views both exposure to and beliefs in conspiracy theories as the downstream products of more foundational motivations, ideologies, worldviews, and identities. While leaving open the possibility that Model A may be correct in some instances, Model B suggests that exposure to conspiracy theories and conspiracy theory beliefs are often symptoms of underlying motivations and can even serve as rationalizations for actions that one is already predisposed toward.

A long and growing body of literature supports this alternative model, which better captures the complexity of factors shaping non-normative behavior. First, it is increasingly clear that while incidental exposure to conspiracy theories does happen, people have significant control over their information environments [27,28]. As such, audiences often seek out pro-attitudinal content [5,29], and content suppliers attempt to meet audience demands with such content [30]. Thus, algorithmic recommendation systems may have less influence on users than popularly argued [31,32]. Second, conspiracy theories and misinformation do not appear to be increasing in quantity and may be attracting less interest over time [33,34]. While developments in communication technology have made conspiracy theories easier to access, they have also facilitated access to quality

Figure 1



Two conceptual models of the relationships between conspiracy theory beliefs, media exposure, and non-normative behaviors.

information. Perhaps it is unsurprising, then, that beliefs in specific conspiracy theories are often found to be either stable [18] or decreasing in popularity [35] over time. Such findings challenge contemporary claims about "infodemics" or "spread" [36].

Third, studies of media effects and information-seeking behavior show that people tend to selectively engage with information that coincides with their existing worldviews and reason away incongruent ideas [37]. Selective exposure and avoidance fueled by motivated reasoning affects conspiracy theories just as it does other forms of information [38]: while social media use is correlated with beliefs in conspiracy theories [17], these correlations are conditional on users' levels of conspiracy thinking [39] and other worldviews, predispositions, and identities [7]. Those who are not predisposed toward conspiratorial explanations or the subject matter of a particular conspiracy theory are unlikely to seek out that theory or be influenced by it on exposure.

Finally, behaviors are the result of a complex set of idiosyncratic experiences, exposures, and traits [9,40], and beliefs and behaviors are often not altered by exposure to ideas [41]. Beliefs and behaviors are, of course, related, and sometimes the former is responsible for the latter; but both share common antecedents. Dark triad traits, for example, could predispose individuals to certain conspiracy theories and, simultaneously, predispose believers to act non-normatively [8]. Therefore, what might appear to be a causal relationship might not be [9]. Moreover, deleterious actions, like extremist violence, are difficult to forecast. Tens of millions of Americans, for example, regularly perceive conspiratorial machinations behind election results [13], yet only thousands have participated in election-related violence, and only when other factors were involved (e.g., top-down elite messaging and organization, political polarization). While any association between conspiracy theory beliefs and extremist behavior is disconcerting, the former does not necessarily cause the latter. Furthermore, other factors may be more proximal causes of extremist behavior than conspiracy theory beliefs.

This is not to imply that exposure to conspiracy theories has no effect but rather that those engaging with conspiracy theories (or related misinformation) might already be disposed toward such content [5,39]. Thus, effects tend to be more "minimal" than "hypodermic" in nature——exposure alone is usually insufficiently persuasive [42,43].

Of course, all models are simplistic and ignore potentially relevant factors. In Model B, there are likely to be

reciprocal relationships between beliefs in specific conspiracy theories and underlying motivations and situational factors can affect both motivations and beliefs, aggravating the relationship between the two. However, our criticism of Model A amounts to more than a recognition of complexity——it has direct, substantive implications for how the conspiracy theory belief literature is interpreted and used. Consider, for example, the previously identified correlations between online exposure to a vaccine conspiracy theory, belief in that conspiracy theory, and vaccine hesitancy. Model A would suggest limiting exposure, perhaps by censoring those conspiracy theories online, to reduce vaccine hesitancy. However, if, as in Model B, underlying motivations (e.g., conspiracy thinking) are simultaneously affecting exposure, beliefs, and behaviors, then content moderation would do little to improve vaccination rates. In short, Model B provides very different guidance about not only the causes and consequences of conspiracy theory beliefs, but how they should be addressed through policy change and other interventions.

Conclusion

We see two important challenges reflected in the literature. The first regards a reconciliation of findings. Well-evidenced theories of belief formation and media effects suggest that both beliefs in conspiracy theories *and* non-normative behaviors are the product of deep-seated motivations (e.g., identities, ideologies); these motivations are the foundational ingredients of belief formation that guide which information we integrate into our belief systems [1,44]. Scholars sometimes fail to account for these underlying motivations in modeling conspiracy theory beliefs and behaviors. Discrepancies such as this must be reconciled if we are to achieve a better understanding of conspiracy theories.

Second, we urge a greater emphasis on believers rather than on specific beliefs, as well as more careful recognition that behaviors——especially non-normative ones——are motivated by a complex array of factors. Even though some conspiracy theories attract large audiences, few act on those beliefs. It is, therefore, important to not conflate those who act with the much greater contingent of those who have been exposed to or believe conspiracy theories but have not acted. Furthermore, conspiracy theories can be sought out and adopted to justify existing behavioral intentions [45]; similarly, factual, non-conspiratorial ideas can motivate those same intentions [46]. Thus, believing the "right" set of facts does not guarantee the "right" behaviors. A deeper understanding of the causes and consequences of conspiracy theories is needed——one that makes use of experiments and panel data in making causal claims and models exposure, beliefs, and behaviors in a way that accounts for the literature on belief formation and media effects.

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Conflict of interest statement

Nothing declared.

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