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Ignoring Theory and Evidence: Commentary on Kok et al. (2018)

Jeff Niederdeppe, PhD and Deena Kemp, MA

Department of Communication, Cornell University, 450B Mann Library Building, Ithaca, NY, USA, 14853

Kok, Peters, Kessels, ten Hoor and Ruiter (2018) make a forceful argument that researchers have ignored and/or misinterpreted scientific evidence on the effectiveness (or lack thereof) of fear appeals in shaping health behaviors. In doing so, they spend considerable time criticizing the use of graphic warning labels in efforts to reduce rates of cigarette smoking. They rely heavily on a published meta-analysis that, in their view, offers the only relevant evidence on the conditions under which fear appeals influence behavior (Peters, Ruiter, & Kok, 2013).

We strongly disagree with Kok et al.'s (2018) perspective and argue that their article ignores theory and evidence essential to addressing this important policy issue. We emphasize alternative theories about how communication interventions work, evidence for behavioral effects in population-level studies, and theory on action tendencies associated with other negative emotions evoked by graphic warning labels and evocative campaign messages related to cigarette smoking.

Ignoring Theories of Campaign Diffusion and Effects

Kok et al. (2018) treat randomized controlled designs as the gold standard for health psychology research. Perhaps this is true when the researcher's goal is to identify discrete psychological processes. But that is not Kok et al.'s stated objective—they seek to identify the conditions under which fear appeals are effective in changing behavior. In many cases, randomized trials may not offer the highest evidentiary standard for achieving this goal.

Theories of campaign diffusion and effects emphasize that communication is a complex and diffuse social process, one that does not lend itself so nicely to the tightly controlled randomized designs that Kok et al. exclusively value (e.g., Hornik, 2002; Rogers, 2003). Both theory and evidence from population-based studies make clear that communication interventions can change behavior, but only tend to work when they (a) generate substantial levels of message exposure among the target audience, (b) diffuse through social networks, and (c) activate institutional changes that support the targeted behavior (e.g., Hornik, 2002; Wakefield, Loken, & Hornik, 2010). The trouble is that social networks, media use patterns, and institutional affiliations are not randomly assigned, so those who seek to design and implement randomized communication interventions often do so in ways that limit the likelihood of widespread exposure and diffusion of treatment. As a result, efforts to carefully

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randomize respondents to discrete message conditions (e.g., high fear/high efficacy messages for one group; high fear/low efficacy messages for another) and ensure that there is no group contamination in exposure can impede the very process that makes a communication intervention effective in the first place – getting people to talk about a message and making sure that message gets reinforced throughout the social and institutional systems in which people live, work, and play.

Ignoring Evidence of Behavioral Effects in Large-Scale Population Studies

A closer look at the accumulated body of evidence from longitudinal field studies evaluating communication interventions to reduce tobacco use, using methods that are sensitive to the complex process of social and institutional diffusion described above, offers a useful contrast to the body of evidence cited by Kok et al. (2018). The meta-analysis that forms the evidentiary base for Kok et al.'s argument limited their analysis to six randomized studies involving 459 total respondents (Peters et al., 2013). Four of these studies relied on college student samples, 3 were published before 1977, all involved fewer than 100 participants, none followed respondents longer than 12 weeks, and all reported on small-scale communication interventions with very limited volume of exposure. In contrast, a 2008 systematic review reviewed evidence from dozens of national, regional, and/or local population-based studies of anti-tobacco mass media campaigns and concluded that well-funded versions of these campaigns are effective in reducing rates of cigarette smoking (Davis, Gilpin, Loken, Viswanath, & Wakefield, 2008). The studies included in this review involved tens of thousands of youth and adults from several countries, and most measured aggregate changes in behavior over an extended period of time. Most evaluated campaigns featuring emotionally evocative messages on the risks of tobacco. A few studies were randomized trials, but the vast majority were not. Similarly, another systematic review identified 32 studies from 20 countries and 812,363 participants which tested the effect of strengthening cigarette pack warnings (usually moving from text to graphic images) on cognitions, emotions, and behavior (Noar, Francis, Bridges, Sontag, Ribisl, & Brewer, 2016). Thirty different analyses focused on behavior change as the outcome; of these, 19 offered evidence of behavior change, usually in the absence of strong, complementary appeals to increase efficacy to quit smoking.

In isolation, none of these non-randomized population studies can fully rule out all possible confounders, as campaigns and warning labels are often implemented alongside other interventions. However, potential confounders differ across study and intervention contexts. In the aggregate, the sheer volume of evidence from these studies would seem difficult to ignore altogether, particularly relative to the limitations of the evidence offered by Kok et al. (2018).

Ignoring Theory on Action Tendencies Associated with Other Negative Emotions

Kok et al. (2018) describe the recent global trend toward requiring graphic warning labels on cigarette packages as embodying a fear appeal. The accumulated body of evidence, however, makes clear that health messages evoke multiple emotions. To illustrate this point, Table 1

presents previously unpublished analyses using data from two papers our research team has published on tobacco product graphic warning label effects on youth (ages 10–13) and adult smokers (Byrne et al., 2017; Skurka et al., 2017). We report on responses to pictures of cigarette packs with graphic warning labels on the top half to packs. In each case, we asked respondents how much they felt afraid, scared, grossed out, disturbed, sad, guilty, angry, and/or annoyed, on a scale of 1 (not at all) to 5 (extremely), after seeing the images (Watson & Clark, 1999).

Adult smokers reported that graphic warning labels made them feel as grossed out (disgusted), sad, and guilty as much as they made them feel afraid, while youth reported significantly higher levels of sadness and disgust than fear in response to the labels ($p < .01$). Thus, contrary to Kok et al.'s (2018) characterization, one might consider graphic warning labels as sadness appeals or disgust appeals as much as one might characterize them as fear appeals.

Functional emotion theories posit that disgust and sadness influence message outcomes differently than fear (Nabi, 2010). Disgust psychologically contaminates associated objects, such as unhealthy behaviors, and triggers avoidance and rejection responses. In addition to framing smoking as socially undesirable (Rozin & Singh, 1999), there is a considerable evidence that disgust makes smoking less appealing and less enjoyable (Clayton, Leshner, Tomko, Trull, & Piasecki, 2017). Sadness motivates withdrawal and reflection. As a message-evoked emotion, research shows sadness predicts deeper information processing (Yoo, Kreuter, Lai, & Fu, 2014) as well as perceived message effectiveness and changes in attitudes toward health behaviors. Kok and colleagues' emphasis on the relationship between fear and efficacy is valid. However, existing theory and research has not implicated efficacy as a necessary condition for disgust and sadness to influence behavioral responses. This may explain why population-based studies make a strong case that graphic warning labels influence smoking behavior (Noar et al., 2016).

Conclusion

Policymakers and researchers must weigh various inputs in deciding the best course of action to address public health issues like smoking. It is tempting to rely on seemingly clear-cut evidence of the variety that randomized studies purport to provide. Randomized trials indeed provide one form of evidence relevant to the topic. But communication interventions and human emotions are complex social phenomena. To make sense of them, researchers need to engage with multiple levels of theory and many different kinds of evidence. Throwing out this complexity in exchange for easy answers does a disservice to both science and public policy.

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Mean Levels of Self-Reported Emotions in Response to Graphic Warning Labels on Cigarette Packs in Data from Byrne et al. (2017) and Skurka et al. (2017)

Table 1

	Adult Smokers			Youth		
	M (SD)	t	n	M (SD)	t	n
Afraid	2.76 (1.43)	--	--	2.55 (1.50)	--	--
Scared	2.77 (1.45)	0.17	139	2.43 (1.46)	-1.39	143
Grossed out	2.94 (1.41)	1.44	139	3.25 (1.40)	5.86***	142
Disturbed	2.85 (1.38)	0.87	139	2.94 (1.40)	2.94**	143
Sad	2.76 (1.37)	0.07	139	2.89 (1.40)	2.61**	143
Guilty	2.73 (1.38)	-0.18	139	1.42 (0.98)	-8.46***	142
Angry	2.10 (1.26)	-5.99***	139	1.94 (1.34)	-4.72***	142
Annoyed	2.10 (1.29)	-5.11***	139	2.09 (1.34)	-3.22**	142

Note. t-value for mean difference compared to “Afraid” as a measure of fear

p<0.001;

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p<0.01