Shrieking Sirens

Schemata, Scripts, and Social Norms: How Change Occurs

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Abstract: This paper investigates the causal relationships among scripts, schemata, and social norms. The authors examine how social norms are triggered by particular schemata and are grounded in scripts. Just as schemata are embedded in a network, so too are social norms, and they can be primed through spreading activation. Moreover, the expectations that allow a social norm's existence are inherently grounded in particular scripts and schemata. Using interventions that have targeted gender norms, open defecation, female genital cutting, and other collective issues as examples, the authors argue that ignoring the cognitive underpinnings of a social norm doom interventions to failure.

Keywords: script, schema, norms, social norms, gender, interventions, spreading activation

1. Introduction

"Labels of primary potency… act like shrieking sirens, deafening us to all finer

discriminations that we may otherwise perceive" (Allport 1954)

The social rules to which one adheres are largely dependent on how one interprets a situation and the actors' behavior within it. How one reads people's behavior, speech, general appearance, and the environment in which they are embedded informs one about how to appropriately respond. Upon recognizing a situation to be of a particular type (e.g., a wedding, a soccer game, a play), one simultaneously recognizes that certain actions are acceptable (or even praiseworthy) and others are not (Bicchieri 2006). Social learning teaches people that they should not wear the tag of their shirt facing outwards while in public, urinate in an elevator, or say "I love you" when greeting a stranger. As we learn the nature of particular situations and environments, we simultaneously learn which behaviors are appropriate, expected, or prohibited within them.

These behaviors often crystallize into shared behavioral rules that prescribe or proscribe behaviors within large classes of situations. These shared rules are what we call social norms (Bicchieri 2006; Coleman 1990; Elster 1990). Social norms, as they are defined by Bicchieri (2006) can be understood as a sort of "grammar for social interactions" and are grounded in scripted sequences of behavior (Bicchieri & Muldoon 2011, para. 1). Like any linguistic grammar, social norms function as prescriptive rules. However, instead of dictating the way in which words are formed and ordered, social norms dictate the behavior that people are expected to engage in while in particular situations. All the behaviors regulated by norms are

interdependent: the individual choice to adhere to a particular norm is conditional on what one expects others to do (empirical expectations) and what one expects others to think a person should do in such a situation (normative expectations). In fact, one prefers to follow a norm on condition of having such social expectations (Bicchieri 2006, Chapter 1). Having conditional preferences for following a norm implies that, were our social expectations to change, our conditions for following a social norm would cease to exist.[1]

Bicchieri (2006) has already made it clear how important these social expectations (empirical and normative) are for the existence of a social norm. Once a group of individuals hold the aforementioned prerequisite social expectations and preferences conditional on them, then it is possible for a social norm to exist. But what triggers the prescriptive behavior that people follow once these conditions are met? What focuses people on a social norm relevant to their particular situation (as discussed by Cialdini et al. 1990)?

Most importantly, where do these critical social expectations come from? We do not constantly reform new expectations upon encountering any new situation. Such a task is unrealistically daunting. We already have relevant expectations stored in memory that we activate with the use of particular cognitive structures to new situations upon encountering them. This ability to call upon existing expectations when encountering novel situations allows for the existence of social[2] norms and their activation. In this paper, we aim to show the deep relationship that exists between social norms and certain cognitive structures. This relationship can explain the cognitive dynamics of norm change that has, up until now, been left unexamined.

What cognitive processes take place when one encounters a new situation that allows for a norm's activation? First, an agent must categorize her situation as being of a particular type, which in turn prompts the activation of a relevant schema, or, in the case of behavioral rules, a relevant script. As we will discuss later, scripted interactions comprise social expectations, both empirical and normative. In any new situation, once a schema or a script is activated, expectations about typical behaviors (empirical expectations) will in turn be activated as well as expectations (if relevant) about appropriate behaviors (normative expectations). The social expectations that social norms are based on are grounded in these scripts.

The process of categorizing a new situation, and eliciting a script or a schema is extremely sensitive to subtle environmental clues that tip one off to its nature. In a rich variety of work with economic games, which we will soon discuss, variance in behavior can be easily explained by the fact that different labels and descriptions may elicit different scripts or that the game itself is interpreted through a particular schematic lens. Behavioral economists are often quick to assume that variance in behavior in very similar games is due to the elicitation of different norms. Our approach goes beyond this simple assumption and investigates the cognitive dynamics which drive the activation of different scripted interactions (and hence different norms).

Understanding the cognitive structures within which norms are embedded is crucial to understand how norms can change. The dynamics of norm change is highly complex and involves many moving parts. We focus on one important and necessary element of such change. The novelty of our work lies not only in the proposed connection among social norms, schemata, and scripts, but also in providing guidance for how to enact a change, at least from a cognitive

viewpoint. Even seemingly small changes to scripts and schemata can have a major impact on catalyzing broader norm change. We argue that in order to be truly effective, interventions aimed at changing harmful or maladaptive collective practices (such as child marriage, racial discrimination, corruption, or codes of silence) should take into account the cognitive underpinnings of social norms in their designs.

In the coming sections, we first discuss literature on scripts, schemata, and the semantic networks in which they are embedded to better understand their relationship with social norms. In doing so, we explore norm activation in more detail. We next discuss insights on schema change to highlight specific mechanisms by which norms themselves may be changed. To demonstrate the relevance of the relationships among scripts, schemata, and social norms, we end by discussing the cognitive relationships we have outlined in relation to past interventions (both intentional and incidental) and how their impact (or lack thereof) on scripts and schemata heavily influenced their efficacy. Current and new policy interventions are increasingly aware of the importance of understanding the nature of social norms, since norms can enhance or prevent effective social, political, and economic interventions (World Bank 2015). In this respect, our analysis offers insights into how effective social norms interventions should be designed.

2. Schemata and Semantic Networks

In what follows, we will discuss the nature of schemata and the cognitive networks in which they are embedded and how their nature has implications for how norms are activated. Schemata are generic knowledge structures that help people interpret the world around them (Fiske & Taylor 1991; Piaget 1976; Rumelhart 1980; Rumelhart 1998; Rumelhart et al. 1986). The more elements

of a schema that we observe, the more likely that schema will be activated (Nadkarni & Narayanan 2007; Rumelhart et al. 1986). The fewer elements relevant to a schema that one observes or the less prototyptical the elements are, the less likely the schema will be activated. A prototype is the "standard" conceptualization of a particular kind, category, or phenomenon (Rosch 1975; Rosch 1978). The closer something is to its prototype, the more input variables would be present for the affiliated schema, and the more likely the schema would be activated (Rosch et al. 1976).

An understanding of prototypes is useful when understanding how to measure or change a schema. Even if something is relatively far from the prototype, we still are quite capable of processing it through existing schemata, up to a certain point (Piaget 1976; Rumelhart et al. 1986). For example, when one encounters an unfamiliar breed of dog, people with a well-established "dog" schema will be quite capable of identifying the creature's species.

Schemata serve as tools that people use to extract the maximal useful information from an environment using the least amount of effort (Rosch 1978). When certain elements of a person, object, environment, or event are not readily observable, the remaining information is "filled in" based on any schemata that are used to process the situation (Rosch 1978; Crocker et al. 1984). Often times, objects, people, and events can be viewed through multiple schematic lenses, and which lens one opts for will shift one's interpretation of future stimuli (e.g., Crocker et al. 1984). Imagine a young child who wishes to show off an animal she has just drawn. The creature has a tail, pointy ears, and whiskers. All of the other scribbles are indiscernible. If one determines that the creature is a cat, then all of the other elements of the drawing which had previously been

uninterpretable will be processed anew through the "cat" schema. If there was a circle next to the creature, and one had settled on the "cat" schema, then it would most likely be interpreted as a ball of yarn. However, if one had settled on the "dog" schema instead, the circle could be instead seen as a tennis ball.

The capacity for multiple schemata to be activated in response to the same stimuli has a direct relationship with the capacity for multiple social norms to be activated in response to the same situation. In a trust game, trustees might be motivated to reciprocate out of a motivation to either reciprocate or to create equality (Xiao & Bicchieri 2010). Depending on how one interprets the situation, subjects could either decide that reciprocation or equality is more important, ultimately resulting in completely different decisions. In this respect, changing these schematic lenses can serve to alter how norms are activated.

As is implied by the connectionist underpinnings of schema theory (see McClelland et al. 1986; Rumelhart et al. 1986), individual scripts and schemata do not exist in isolation; they are inherently linked to each other to varying degrees, and the activation of one influences the activation of another. The entirety of one's interconnected schemata is termed a semantic or associative network (Collins & Loftus 1975; Collins & Quillian 1969; Woods 1975). A semantic network is a model of conceptual interconnectivity, with each individual schema serving as a node, and each relationship between schemata represented as a link of varying strengths. Chronic activation of multiple schemata in tandem will increase the strength of their associative links.

The interconnected nature of schemata and the semantic networks in which they are embedded influences both perception and behavior. When one schema is activated, other schemata with which it is associated are simultaneously primed for activation (Lerner et al. 2012). This process is known as spreading activation (Collins & Loftus 1975). This interconnected nature of schemata implies that social norms, which may be triggered by schemata, may in turn be indirectly activated through spreading activation, as we will discuss in a coming section.

3. Cultural Schemata, Social Schemata, Scripts, and Social Norms

Social interaction and shared experiences drive people within a culture to construct certain schemata in similar and converging manners (Casson 1983; D'Andrade 1981; Strauss & Quinn 1997). Technically, anyone's schemata are unique unto him or herself, but many lay schemata are largely shared within a culture. Schemata that are shared within a culture are more resistant to change, as they are continually reinforced through social interaction (Strauss & Quinn 1997). Whether or not a schema is shared is an important factor to take into consideration when attempting to change it. The degree to which a schema is collectively held will strongly influence how effective (and necessary) an intervention designed to change it will be.

Evolutionary-driven propensities and cultural pressures drive people to attend to and process certain clusters of stimuli over others (Rosch 1973). One example of this tendency that is particularly relevant to social norms is social schemata. Allport once described social categories[3] as "exceedingly salient and powerful. They tend to prevent alternative classification, or even cross-classification… 'labels of primary potency'… act like shrieking sirens, deafening us to all finer discriminations that we might otherwise perceive" (1954, p. 179). In fact, not only are

people sensitive to what group they and others belong to, but they exaggerate the boundaries between social categories (Dawes 1966; Saltz & Medow, 1971; Sigel et al. 1967).

The schemata through which we cognitively process individuals also have a considerable influence on how we perceive people and their actions. Consider gender roles. If women are associated with characteristics such as nurturing, caring, selflessness, and so forth, people will expect that they act in line with these characteristics, and any deviation from what is considered 'normal' will be accompanied by specific causal attributions, emotional reactions, and appropriate actions. Domestic violence is not necessarily the result of a male's sudden, irrational outburst of rage. It is often instead the result of a chain of inferences that are triggered by the violation of a schema that is perceived as natural and "right." If a prototypical "good wife" is expected to take care of her husband, obey him, have children and take good care of them, be nurturing and compliant, any violation of the schema will elicit a causal attribution. If the "abnormal" behavior has no other explanation, a woman might be perceived as rebellious, disrespectful, and mean. The husband's perceivably "legitimate" (normative) expectations have been violated, and anger is the appropriate emotion. Domestic violence is thus "justified" by the violation of what appear to be legitimate and normal expectations. It is important to explicitly note how social expectations can be grounded in a social schema (in the previous example, a "good wife"). We have expectations about what particular groups of people do, and what they think one should do; when we identify someone to belong to a particular group, these expectations are elicited.

In addition to their relationship with schemata, social norms are also grounded in scripts (Bicchieri 2006). A script is, in its most basic form, a schema for an event, with varying levels of specificity (Abelson 1981; Schank & Abelson 1977). We engage in scripts upon the activation of situational triggers that inform us what chains behaviors to engage in. We identify and process these triggering factors through other schemata (Bicchieri 2006). For example, the "good wife" schema incorporates several scripts having to do with sort of specific behaviors are expected from a wife: how and when she should prepare food, how often she should have sex with her husband, the things she should say, how she should interact with the neighbors, and so on.

The "appropriate behaviors" that are expected of a "good wife" are the elements of a script that are tied to social norms. Empirical expectations inform us of what people usually do and expect us to do, and normative expectations inform us what people think we "should" do. These expectations help shape the strength of how prescriptive a scripted set of behaviors is. Without normative expectations, a script could be seen as a sequence of actions in which one *could,* and typically does, engage. With the presence of both empirical and normative expectations, the same script in the same situation becomes a sequence of actions in which one *should*, and typically does, engage. In these respects, specific scripts have the capacity to harbor social expectations, just as broader social schemata do.

People's implicit sensitivity to such social expectations drives them to conform to shared behavioral scripts (Bicchieri 2006). An American eating at a restaurant in a foreign country where tipping is not expected might tip her waiter, not out of generosity, but simply because her "restaurant" script had been activated. The American's "restaurant" script could easily feature

"tipping the waiter" as a vital action-element. Failing to tip the waiter would mean an explicit deviation from an ongoing behavioral script. Additionally, most Americans consider "tipping the waiter" to be an action element that one *should* engage in (given adequate service), rather than an action in the restaurant script than one simply *could* and often does engage in.

If someone were to fail to tip the waiter while engaged in a "restaurant" script while in a culture in which most people think one *should* tip the waiter, then a third party's disdain or indignation in reaction to the script deviation would feel justified, just as a man who feels that his wife has violated his "good wife" schema might feel justified in getting angry at her. However, if a restaurant-goer were to deviate from the "restaurant" script by failing to "read the menu" or "sit down," (both common action elements in the "restaurant" script in which one *could*, rather than *should*, engage), it might seem strange to third parties, but they would not react to it with the same emotional intensity as they would if the restaurant-goer were to deviate from a *should* element.

As in the case with schemata, the same situation can often be responded to with a variety of potential scripts, especially when the situation is ambiguous. Bettenhausen and Murnighan (1985; 1991) discuss this process in relation to economic games. They show how different players may interpret the same game in different ways, depending on what the game reminds them of most. More colorful evidence of this phenomenon is provided by Liberman, Samuels, and Ross (2004) in which they demonstrate that when playing a simple dictator game, subjects were much more likely to behave selfishly when told that they were playing the "Wall Street Game," but they were much more likely to be generous when told that they were playing the

"Community Game." The provision of these two different labels for the same game served to activate completely different scripts. The abstract process that the dictator game entails was seen through dramatically different schematic lenses for subjects in each condition.

Henrich and colleagues (2004) provide particularly compelling evidence of the effect that different schematic interpretations can have on behavior. They recruited members of many small-scale societies across the world to engage in a series of economic games, and respondents' behavior varied wildly from culture to culture. The participants were not treating these games as the abstract exchanges that they were – instead, they were attempting to process them through the most appropriate schematic lenses that they had available. As these schematic lenses varied from society to society, so too did participants' behavior. The Orma, for example, recognized that the public goods game was similar in nature to the *harambee*, a community-driven way to contribute to a public good, and thus contributed generously. On the other hand, the Au and Gnau of Papua New Guinea both provided *and rejected* large offers in the ultimatum game. For them, gift-giving is a status-seeking mechanism, and accepting gifts entails a strong obligation to reciprocate (with unrepaid debts resulting in a diminished social status), so a simple monetary proposal in the ultimatum game was rebranded by the heavy cultural baggage of obligation and reciprocation.

Recognizing the rich variety of ways that different schemata can lead us to interpret out world is very important, and failing to do so has doomed past interventions designed to change harmful practices to failure. For example, Yoder (1995) discusses how the nature and treatment of certain childhood diseases for residents of Lubumbashi, Zaire (now the Democratic Republic of the

Congo) differs considerably from the contemporary biomedical approach. What a doctor might consider to be diarrhea could be classified as one of six distinct diseases by locals, depending on their perceived symptoms. Though all six disease classifications featured loose stool as a central symptom, only "Kuhara" was equated with what a doctor would diagnose as "diarrhea." When health organizations attempted to inform residents of Lubumbashi about the appropriate treatment for diarrhea, locals likely interpreted the advice to be only relevant to Kuhara, and not to the others. Indeed, respondents readily reported giving the appropriate diarrheal treatment to cases of Kuhara, but not to in response to the other five diagnoses.

Situational trigger cues may orient people towards different expectations (which may be empirical or normative), and by extension, different norms. As demonstrated by Cialdini and colleagues (1990), particular environmental cues can make a littering norm salient, to varying degrees. In one of their experiments, they stuffed flyers into the mailboxes of students and fixed up a mailroom so that the floor was either littered with trash, completely clean, or clean with the exception of a single partly eaten watermelon rind. In the messy condition, people tended to throw their own unwanted flyers on the ground (likely as it was obvious that the cleanliness script was not appropriate), while in the clean condition, people followed suit and were reasonably clean themselves. Interestingly, subjects were the cleanest in the condition where the mailroom was clean except for the half-eaten watermelon.

Though the clean and dirty environments served as cues for how collectively important a norm of cleanliness was, the watermelon rind was the most effective trigger cue of all. The single piece of garbage stood out in such contrast to the otherwise clean environment that it was likely

difficult *not* to think about the behavior of the one messy person who ruined the whole mailroom – this violation called the strongest attention to the *should* element in a cleanliness script (recall how particular expectations, which are relevant to norms, are fundamentally grounded in scripts). Not only does this particular experiment serve as a demonstration that not all trigger cues are "created equal," but also that a norm can be activated in a variety of ways.

Just as a schema can be primed for activation via the activation of an associated schema, so too can a social norm be "primed" for activation through the activation of relevant schemata and scripts in its semantic network. For example, seeing someone shout obscenities at a beggar could have the contrary effect of boosting the likelihood of donating for an observer. Viewing a norm transgression calls attention to the norm itself, thereby making it more likely to be activated in the observer (Bicchieri 2006; Harvey & Enzel 1981). Such a norm transgressor can indirectly serve as a triggering cue for a norm of, say, beneficence (Macaulay 1970).

Harvey and Enzel (1981) discuss how social norms, like schemata, might be cognitively organized in a network, and thus the activation of one will influence the activation of another. Cialdini and colleagues (1990) provide support for this idea experimentally by placing flyers on the windshields of strangers returning to their car. The flyers advertised a variety of messages, and the semantically closer each individual message was to the norm of not littering (e.g., a flyer encouraging recycling as opposed to a flyer encouraging voting), the less likely the recipient was to throw the flyer on the ground. The stronger the association between the flyer's message and littering, the more likely one's norm of not littering was to be activated via spreading activation.

Aarts and Dijksterhuis (2003; see also Joly et al. 2008) provide further support for the hypothesis that norms can be activated via spreading activation. They told subjects to scrutinize an image of one of two locations. Some were told that they were going to have to visit the location later in the experiment. Subjects were later presented with a series of 24 words and asked to decide as fast as possible which words were real and which were made up. After being both shown the image of a library *and* told that they were going to visit it, subjects were able to identify words more quickly if they were linked to the normative behavior of being silent (words like *silent, quiet, still,* and *whisper*). More interestingly, subjects under these same conditions also spoke with a significantly lower volume than other subjects, providing behavioral evidence that their "library" schema and associated scripts had been activated. Being told that they were going to visit a library (as opposed to just looking at an image of one) made the subjects activate their "library" schema and associated scripts more effectively.

It should be clear that norms share a close and complex relationship with scripts and schemata. By changing the scripts and schemata through which people understand social interactions or reconfiguring the semantic networks in which such schemata are embedded, one could theoretically change what people consider "appropriate" and thereby change the associated social norm(s). Examples from behavioral economics (though they do not openly theorize about social norms and related scripts' influence on behavior) provide evidence of this phenomenon with respect to different interpretations of fairness (e.g., Frey & Bohnet 1995; Hoffman et al. 1994). This change in perception of what is appropriate could similarly be accomplished by creating novel schemata and shifting what scripts and schemata one typically relies upon when understanding social situations.

4. Script and Schema Change

"There is nothing so obdurate to education or criticism as the stereotype" (Lippmann 1922, p. 99). The same can be said of schemata in general. Most research on social schemata has emphasized schemata's ability to assimilate schema-discrepant information and resist change (e.g., Brown 2011; Crocker et al. 1984; Hilton & von Hippel 1996). As we argue that social norms are embedded into scripts, the possibility of changing scripts and schemata is of foremost importance in an analysis of norm change. Fortunately, schema change is possible. Certain schemata are easier to change than others, and there are several theoretical models of how it can be accomplished.

Piaget believed that people strive to maintain an equilibrium between the outside world and the internal mental systems through which they process the world (1976). When perceived stimuli and existing schemata do not match perfectly, there are two ways to resolve the conflict: assimilation or accommodation. As it first develops, a new schema is loose and vague (Piaget 1964). For example, the internal structure of a new schema for "dog" might consist of just a few vague elements, like "a living creature" and "has four legs." As we accumulate new experiences, some of which defy our schematic interpretations of "dog," we either assimilate the new information and cast aside the discrepancies or accommodate it by refining the schema and change its boundaries. Information that confirms an existing schema reinforces it and makes it even more difficult to change in the future (Mandler 1984). The more nuanced and well-established a schema is, the better able one is to ignore disconfirmatory evidence.

Some schemata can easily be disconfirmed through simple observation. However, not all elements of schemata are so objectively verifiable (Crocker et al. 1984). Social schemata, in particular, are highly subject to interpretation, more capable of assimilation, and thus more resistant to change.[4] Stereotypes[5] are a classic example of this. For example, if one held a stereotype for "city people" that included the element of "unfriendly," one could easily interpret a range of behaviors exhibited by a "city dweller" as unfriendly, especially if such behaviors are ambiguous in nature.

In addition to the subjective nature of social schemata, there are several biases that can hamper the process of schema revision. Due to biases like the confirmation bias and motivated reasoning (e.g., Devine et al. 1990; Nickerson 1998; Kunda 1990), people often attend to and remember schema-consistent information (with some exceptions), especially when one finds it undesirable to reject the schema. A similar process hamper social norm change. As people might have personal investments in particular maladaptive norms (as will be discussed later), anticipating and taking steps to avoid potential biases like motivated reasoning and confirmation bias will help keep an intervention to change a norm effective.

4.1. Specific models of schema change. There are several theoretical models of schema change, and there are certain circumstances under which schema change is more likely than others (Brown 2011; Crocker et al. 1984; Hilton & von Hippel 1996; Hewstone et al. 1992; Hewstone et al. 1992; Poole et al. 1989; Queller & Smith 2002; Rothbart 1981; Weber & Crocker 1983). Most empirical work on schema change has been performed in the specific realm of stereotype

change. Understanding these models will help inform how schemata that guide and trigger social norms can arise and change.

The most prominent models of schema change are the bookkeeping model, the conversion model, and the subtyping model (Crocker et al. 1984). Certain models are thought to be more appropriate under certain circumstances. The most intuitive model (given a basic understanding of schemata) is the bookkeeping model. It asserts that people continuously update their schemata whenever they encounter discrepant information (Rothbart 1981; see also, Rumelhart & Norman 1976). A few instances of discrepant information will not change one's schemata much, but in aggregate, many instances will.

The conversion model of schema change provides a more dramatic alternative to the bookkeeping model. This model asserts that a few highly salient instances of discrepant information will catalyze the process of schema revision (Rothbart 1981). Instead of many instances of mildly schema-discrepant information resulting in many minor revisions to one's schema, the conversion model asserts that the observation of a few highly salient schema discrepant instances will trigger a single, sudden revision.

Finally, there is the subtyping model. The subtyping model asserts that the observation of schema-discrepant information will not cause one to revise one's overall schema at all but rather induce one to create a new, subschema that is capable of "explaining" the discrepancy (Hewstone et al. 1992a). This new schema is a specific subcategory of the original schema, and it

is specifically tailored to the class of observed information that is discrepant with the original schema.

Empirical evidence has been found to support all three models of schema change to varying degrees. Support for the conversion model is provided in a study by Gurwitz and Doge (1977) in which they provided subjects with descriptions of three members of the same sorority. In one condition all three members were described to be mildly discrepant from the common "sorority" stereotype, or, in another condition, just one was described to be highly discrepant, depending on the condition. When subjects rated a fourth member of the sorority on her likely qualities, being presented with the single "glaring exception" resulted in less stereotypical ratings than being presented with all three mildly discrepant members.

Weber and Crocker (1983) compared all three models and found empirical support for the bookkeeping and subtyping model but little support for the conversion model (for similar results, see Hewstone et al. 1992a). In their first experiment, subjects were presented with descriptions of either lawyers or librarians in groups of either 6 or 30. Schema-discrepant information was either concentrated in a few individuals or dispersed across many individuals. Subjects rated how typical each characteristic was of the overall group and provided an open-ended description of a new, unknown lawyer or librarian. When many example individuals displayed non-stereotypical behavior, subjects exhibited the strongest stereotype reduction, especially when presented with 30 rather than 6 examples, indicating that the bookkeeping model was at work. In a follow-up experiment, the authors varied the "extremeness" of a schema-discrepant piece of information. This variation had little impact on how stereotypical the recalled information was, suggesting

that subjects explained the unusual behavior away as "exceptions to the rule" through subtyping. Weber and Crocker (1983) acknowledged that the conversion model might apply when subjects do not have well-established schemata (see also Queller & Smith 2002). That is, when one is unsure of the general characteristics of a prototype, a single piece of evidence could be treated as highly informative.

It is important to address why subtyping prevents schema change in some circumstances and not others. One proposed explanation is that the discrepant members in some cases are simply *too* atypical, thereby making the classification of them as "exceptions" more reasonable (Johnston 1992). In support of this prospect, a multiple regression analysis conducted by Johnston (1992) found that the perceived typicality of stereotype disconfirmers mediated the degree to which an overall stereotype changed. In Johnston's (1992) study, subjects judged slight disconfirmers to be more typical than strong disconfirmers, and thus the slight disconfirmers had a greater impact on the subjects' overall stereotypes.

Given schema theory, the proposed relationship between the prototypicality of a disconfirmer and the degree to which a schema changes makes sense. If something is only mildly prototypical, the associated schema will be activated less fully. The observation of a new pattern of behavior that only partially overlaps with an existing schema may give rise to a related yet separate schema. This reasoning explains why raising the extremeness of the discrepant qualities in Weber and Crocker's (1983) second experiment failed to lead to further schema revision—the discrepant members were likely seen as more atypical (and thus easier to subtype), thereby preserving the overarching schema of "librarian" or "lawyer." For this reason, when attempting

to change a schema (or, by extension, a related social norm), measuring a prototype will be an important early step to take.[6]

Another dimension that influences a schema's susceptibility to change is how homogenous the associated class is perceived to be. Recall how in Gurwitz and Doge's study (1977; see also Hewstone et al. 1992b), the description of one highly discrepant individual had a bigger impact on the degree to which subjects revised their stereotype, yet Weber and Crocker (1983) found the opposite result. In Gurwitz and Doge (1977), subjects had more difficulty "explaining away" the concentrated discrepant behavior than subjects did in Weber and Crocker (1983). One proposed explanation is that the members of the sorority in Gurwitz and Doge (1977) were perceived to be more homogenous than the social categories used in other experiments (e.g., Brown, 2011; Hewstone et al. 1992b). The increased homogeneity made perceiving the discrepant case as "an unusual category member" difficult—after all, a homogenous group has few "unusual members" by definition. If the perception of group homogeneity does not change, then logically, either the outlier must be perceived to be a member of a separate class (that is, be processed through separate schemata) or the schematic understanding of the class as a whole must change.

In addition to the perceived typicality of a schema-discrepant instance and the perceived homogeneity of the class to which it belongs, the saliency of the discrepant instance influences the instance's potential to induce change (Crocker et al. 1984; Rothbart 1981). This point may be intuitive, but it is worth noting. One will never be motivated to revise one's schemata if one never notices a discrepancy between one's schematic models of the world and the world itself. In addition to schema-defiers needing to be salient, the schema of interest must be accessible before

it can change (Crocker et al. 1984). One would never notice a discrepancy between the observations and the schema of interest, if the schema of interest is never activated.

Although the activation of alternative schemata can prevent a schema of interest from changing, the availability of alternative schemata can be used to one's advantage when attempting to induce schema change. Crocker and colleagues (1984) discuss how schemata (especially in the case of religious and scientific beliefs) are abandoned, rather than revised, only when there is an available alternative to replace it.[7] This makes sense—even if one is aware that a mode of understanding a phenomenon is flawed, one still needs to understand it, and a flawed understanding is better than no understanding.

4.2. The role of semantic networks in norm activation and change. In addition to changing the schemata that, when activated, serve as trigger cues to particular social norms, one can also theoretically influence a social norm's activation by creating new links between existing schemata in its semantic network. Little theoretical work has been conducted on the relation between norm activation and associated elements within its semantic network. Regardless, we believe such expansion of the semantic network is possible.

This expansion could be made possible by creating a novel schema and associating it with the social norm of interest, thereby creating a new trigger cue for the norm. In creating a new trigger cue, one would expand the circumstances under which a norm applies. Take the example of the debate about whether a firm is only responsible towards its shareholders or also to stakeholders who the firm may harm through negative externalities (e.g., pollution). Initially, the firm may

only believe that a norm of responsibility applies to shareholders, but protests and governmental interventions make it clear that the firm also has a responsibility to communities that it affects. Effectively, these protests and interventions serve to form a new link between the norm of responsibility and a population of stakeholders. Conversely, one could disassociate an existing trigger cue with a social norm, thereby destroying an existing trigger cue and restricting the circumstances under which a norm is activated.

Similarly, the association of two originally unrelated norms could influence their respective likelihood of activation. As mentioned earlier, Cialdini and colleagues (1990) demonstrated how the activation of one norm (e.g., "recycling" and, to a lesser extent, "voting") primes a related norm ("not littering") for activation. Creating associations between two otherwise unrelated norms should yield similar results.

4.3. Script change. Unfortunately, less research has been conducted on how to change a script as compared to how to change a schema. However, as a script is, by definition, a type of schema, the lessons learned from the literature on schema change should generally apply to script change.

Anderson (1983) conducted research on how to manipulate script adherence. In his study, subjects were asked to draw cartoons of a character either engaging or not engaging in a series of scripts. For example, in a "blood donation" script, subjects drew characters who either ended up donating blood or refusing to donate blood. Depending on the condition, subjects were instructed to treat the main character as themselves, a close friend, or a disliked acquaintance, and they drew each script one, two, or three different times, with different versions of the cartoon each

time. Before and after drawing the cartoons, the subjects rated how likely they thought they were to engage in each script if given the opportunity.

The more times subjects were instructed to draw themselves following the blood donation script, the more likely they were to predict themselves engaging in it. The opposite was true for subjects who were instructed to draw themselves rejecting the script. Drawing a friend or a disliked acquaintance engaging or not engaging in a script had no impact on subjects' intentions. Interestingly, in a follow-up study, Anderson (1983) found that the impact of drawing oneself engaging (or not engaging) in a script remained unchanged three days later, indicating that the manipulation *sustainably* influenced subjects' perceived likelihood of following the script. People did not forget the alternate reality once they had learned of it.

5. Script and Schema Change and the Efficacy of Past Social Norm Interventions

There have been many attempts to curb or change maladaptive collective practices, especially those linked to social norms. Too many of these attempts have been unsuccessful (e.g., Sanan & Moulik 2007; Toubia & Sharief 2003). Changing the grammar of a society is not so easy. Nevertheless, there are several interventions that have been successful in changing norms. We will discuss the success (or lack thereof) of these interventions in light of the model of norms being embedded into scripts and triggered by schemata. We will discuss how the successful ones achieved meaningful progress precisely because they effectively shifted adherence to particular scripts or schemata.

5.1. Abandonment of Female Genital Cutting: The Saleema Initiative. In Sudan and many surrounding countries, female genital cutting (FGC)[8] is a dominant social norm in many communities. Women who undergo FGC tend to suffer from numerous health problems throughout their lives and during childbirth, and many consider the practice to be a human rights violation (e.g., Althaus 1997). In 1990, FGC rates in young girls were as high as 92% in Sudan, and by 2006, these rates had only dropped to 89%, despite attempts to end the practice (Helmore 2012).

In Sudan, an uncut woman is commonly termed "ghalfa," a pejorative word that carries connotations of prostitution, promiscuity, and impurity. Even if parents are aware of the negative health consequences of FGC, they often continue to cut their daughters in order to protect them from the negative social consequences of "being ghalfa" (Toubia & Sharief 2003). The Saleema campaign was designed in large part to rebrand women who have not undergone FGC as "Saleema." Saleema is an Arabic name that means "whole, intact, healthy in body and mind, unharmed, pristine, untouched, in a God-given condition, [and] perfect" (Helmore 2012, p. 18). The campaign's primary tactic was to encourage FGC abandonment by rebranding uncut women in a positive, socially acceptable light.

Prior to the Saleema campaign, there was no alternative term for an uncut woman. In other words, the "ghalfa" schema was the only one through which one could process an uncut woman. As mentioned earlier, even if one is aware of the flaws present in an existing schema, an insufficient schematic understanding is functionally superior to no schematic understanding at all. Instead of taking on the difficult task of completely reversing the deeply pejorative "ghalfa"

schema, the designers of the Saleema campaign decided to orient the Sudanese people towards the novel and positive "Saleema" schema. This tactic required no change to the "ghalfa" schema at all—only the creation of an alternative one.

The initiative featured both educational elements that informed people of the nature of being "Saleema" (which serve to create the novel "Saleema" schema) and elements that spread the belief that many people endorsed the Saleema perspective (which help combat pluralistic ignorance; Helmore 2012). The initiative was public in nature and was broadcasted via radio, television, and poster advertisements. The media discussed the many benefits of being Saleema and how change is a good thing, thereby promoting Saleema without directly damning or discrediting what many consider to be a venerable tradition.

Many Sudanese public figures and celebrities have come out in support of the campaign, helping to establish its legitimacy. In their declarations of support, these figures wear traditional clothing in the Saleema colors, mainly orange, red, yellow, and green (Helmore 2012). Men and women who support the campaign are similarly encouraged to wear this Saleema "uniform" to signal their support for the Saleema perspective. In public maternity hospitals and health centers, Sudanese women are told about the benefits of being "Saleema" and are invited to join in the campaign. Those who join agree to not cut their daughters and sign a pledge of their support that is prominently displayed at the hospital. All these clear signals of collective support serve to inform the unconvinced about a shift in perspective that is taking place.

Without these outward signals of support, it would be possible that Sudanese people privately embrace the Saleema perspective, but outwardly say nothing out of the fear that their fellow citizens retain the traditional understanding of FGC. FGC is typically a taboo topic to bring up in casual conversation (Behrendt 2005; Tostan 1999), so without the overt signals of collective support, people may never adjust their empirical and normative expectations of how their peers feel about FGC. In other words, these repeated, highly salient displays of support for the Saleema perspective all serve to defy the traditional conceptualization of "a Sudanese person" (the relevant reference group) as someone who endorses FGC. Changing a population's attitudes towards a practice is a good first step, but if such a population's behavior is contingent upon what they expect their peers think one does and should do, then changes in personal perspective will not be sufficient to change behavior.

These signals shift the target population's conceptualization of the average Sudanese person and, by extension, what they expect from the average Sudanese person. This change would likely best be modeled by the bookkeeping model of schema change. Every time one hears a publicized endorsement of the campaign, every time one sees someone wearing the Saleema clothing, and every time one sees a pledge of support or hears someone talking about the Saleema perspective positively, the old conceptualization of a Sudanese person who endorses FGC is challenged. These are not a handful of highly discrepant instances (which would imply the conversion model), but a multitude of mild to moderately discrepant instances. Recall that the more prototypical a schema-defiant piece of information is, the more difficult it will be to explain the discrepant information as an "exception" (Johnston 1992).

The Saleema campaign appears to have been fairly successful so far: as of 2013, over 600 communities had joined the Saleema campaign and signed a document pledging to boycott FGC (Abbas 2013). In West Kordofan (a province of central Sudan), the local commissioner even petitioned the authorities to change the name of the village to "Saleema" (Helmore 2012). If anything, this is an indicator of just how positive a signal the novel "Saleema" schema is sending to those who adopt it.

5.2. Tostan's community approach to combating FGC. Another intervention strategy to combat FGC is the Community Empowerment Program (CEP) run by Tostan, which is designed to encourage positive behaviors and lifestyles (Diop et al. 2003; Diop & Askew 2009; Monkman et al. 2007).[9] The CEP typically lasts about three years and has many goals, and one of them is to impart community members with a formal understanding of "human rights" (Diop & Askew 2009; Monkman et al. 2007). Over the course of a year and 100 discussion sessions, villagers are encouraged to think about their fundamental wants and needs with the intention of ultimately developing a conceptualization of what people are fundamentally entitled to (i.e., specific "human rights"). As their "human rights" conceptualization develops, community members are encouraged to consider whether or not existing communal behaviors violate or are in line with such rights. For example, rather than being told that FGC is "wrong" and that they should stop it, community members decide for themselves whether FGC violates their right to health and if they should stop engaging in it. All of what occurs in the CEP is conducted in a very public, transparent, and self-directed manner, and any decision-making is explicitly community driven.

Assuming that the typical participants of the CEP indeed do not have a formal conceptualization of human rights, then the many discussion sessions should serve to develop a new set of schemata for "human rights." After such schemata are first developed, we predict that they would be further refined through the bookkeeping model of schema change: Each discussion session can gradually add further depth and nuance to the emerging schemata.[10] Additionally, discussing human rights in the context of specific relevant behaviors serves to connect the "human rights" schemata with behaviors in community members' semantic networks. For example, asking questions like, "does FGC violate your right to health?" would help facilitate a negative associative link between the schemata for "FGC" and "right to health." Such a new schematic link functionally rebrands FGC as a violation of human rights. The fact that this cognitive reframing is transparently happening at a collective level means that community members recognize that their peers are experiencing the same shift in perspective that they themselves are (Bicchieri & Mercier 2014).

Even if some community members decide not to involve themselves with the CEP, the facilitators of the CEP encourage more involved participants to start discussions about the program's material with the rest of their community. Uninvolved members should update their schemata via such diffused discussion. These repeated interactions also serve to disconfirm the element of "supporting FGC" within the "fellow community member" schema in a bookkeeping-style mechanism of schema change. Discussing human rights and how practices like FGC violate them clearly signal that members of the community are dropping their support for the practice.

There are many other elements in Tostan, Saleema, and other interventions that point to other necessary conditions for successful norm change (Bicchieri 2015). We are not discussing them here because our goal is simply to highlight that a powerful avenue for successful social norm change is the creation of a new schema or change to an existing one that leads people to re-conceptualize traditional practices in a different light. Alternatively, a social norm may also change by reconfiguring the structure of the script(s) into which it is embedded. These changes may be simple or they may be broad in scope.

5.3. Ineffective FGC interventions. While the Saleema initiative and interventions led by Tostan have found some success in reducing adherence to the FGC norm, many other attempts have been unsuccessful. One of the most common methods of attempting to reduce FGC rates is to simply inform a target population about the negative health consequences that stem from FGC and hope that they respond accordingly (Toubia & Sharief 2003). Such methods have merely caused target populations to hire trained health professionals to perform the cutting operation. While hiring people with medical experience may lead to safer surgeries, such a behavioral shift yields no actual reduction of FGC rates, and the majority of negative health consequences may persist. Indeed, Toubia and Sharief (2003) review survey data that reveal that 97% of Egyptian girls and women have still undergone the surgery, despite 20-30 years of health information-based interventions. While informing people about physical risks of a maladaptive practice is important, it is insufficient—such methodology ignores the social pressures that drive people to engage in them. Even if one were to reframe FGC as a dangerous practice, it is still linked to many positive elements, such as purity and virginity, that are so socially important that they overwhelm any health-related considerations in the decision-making process. We want to stress

that when practices are interdependent (as those that are or are supported by social norms), it is necessary to target the entire network of norm-followers. In this sense, successful interventions are effective precisely because they target people's collectively held *social* schemata or scripts (thus changing social expectations).

Legal interventions on their own have similar limitations in that they ignore the important cognitive underpinnings of certain practices. Legal norms that act contrary to social norms typically result in little behavioral change (Bicchieri & Mercier 2014; Kahan 2000; Stunz 2000). Just as how bribery persists in countries where it is explicitly illegal, FGC persists in countries where practicing it has been made illegal and carries the risk of heavy penalties (Toubia & Sharief 2003). Even if one is aware that cutting risks incurring a monetary fine, such sanctions are difficult to enforce, and following the law would mean that one's daughter could be devalued by her community, and she would have a more difficult time finding a husband.

5.4. Combating open defecation with Community Approaches to Total Sanitation. Other effective social norm interventions are the Community Approaches to Total Sanitation (CATS) and specifically the Community-Led Total Sanitation (CLTS)[11] program, which together are designed to combat open defecation or OD (Galbraith & Thomas 2009; Kar & Chambers 2008). OD is practiced by 1.2 billion people in the world and is the cause of many severe health issues, including diarrhea, acute respiratory infections, and other diseases via the contamination of ground water and agricultural products (Galbraith & Thomas 2009). The CLTS approach appears to effectively motivate people to abandon OD by changing existing schemata and prompting the development of novel scripted behavior.

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In many societies, feces are not always associated with disease, and OD is not always looked upon in a negative light (Mukherjee et al. 2012; Wateraid 2008). Similar to Tostan's approach, the CLTS is designed in such a manner to encourage community members to develop these associations, and do so on their own (Kar & Chambers 2008). People have a harder time discounting their own reasoning and conclusions than the arguments of a stranger, and so this design is sensible. Additionally, the first thing an intervention leader does when implementing the CLTS is establish a sense of trust and rapport with the target community to encourage them to take his or her messages seriously (Galbraitht & Thomas 2009; Kar & Chambers 2008).

Once a rapport has been established, then what is known as the "triggering process" begins, in which the community is exposed to problems associated with OD (Kar & Chambers 2008). For example, in the "transect walk" the intervention leader escorts the entire community through OD fields and has them analyze the fields in detail (Kar & Chambers 2008, p. 27). These walks are implemented so as to make everyone feel as much collective embarrassment and disgust[12] as possible and to attribute it to OD.

In addition to the transect walk, CLTS intervention leaders teach how OD can lead to disease by visually simulating the disease transmission process (Kar & Chambers 2008). For example, a facilitator can put food down next to a pile of feces and wait for flies to start travelling between each pile. When asked to eat the food, community members inevitably refuse to do so, pointing out how the travelling flies are infecting the food with fecal matter. Through realizations like this one, community members independently form the link between OD and eating one's own (and

one's neighbors') excrement. Many similar connections can be made in the CLTS between OD and disease transmission (see Kar & Chambers 2008).

Once the triggering processes are complete, and assuming people are effectively convinced that OD is an unhealthy practice and needs to be stopped, people are encouraged to discuss how to go about stopping OD (Kar & Chambers 2008). By discussing what is often a taboo subject in these collective forums, people will not have to fear the kind of social whiplash that they might otherwise experience if they were to broach the topic on their own (Bongartz et al. 2010). People in many such communities are very hesitant to talk about defecation, and CLTS facilitators use a range of tactics (such as jokes and songs) to make people more comfortable talking about it. Without these tactics, even if someone were to independently identify OD's problems, he might never bring it to public attention as such topics are unfit for public discourse.

The kind of schema change that is being induced by the CLTS would likely best be captured by the conversion model of schema change. The handful of triggering processes collectively serve as a small collection of highly salient, schema-discrepant observations. Each example is so explicit and intense that only a few of them are necessary to induce schema revision.

Each triggering process is designed to link "open defecation" with negative nodes (e.g., disgust, disease, and shame) in its semantic network (Kar & Chambers 2008). Additionally, the CLTS does not induce the association of these elements with the script[13] of "private defecation," thereby elevating it above "open defecation" by comparison. At the beginning of the intervention, the ideas of OD and private defecation were likely largely equivalent concepts. The

change that "open defecation" experiences throughout the intervention process serves to disassociate it from "private defecation."

The fact that all community members experience the triggering processes collectively serves to evenly distribute the blame of OD. People are made to feel that OD is both everyone's fault and everyone's problem, and issues of pluralistic ignorance are avoided. Not only will everyone associate OD with disgust and disease, but it will be apparent that one's peers are developing the same associations. All of this script and schema change eventually leads to a change and creation of normative and empirical expectations, and, by extension, the creation of a social norm of latrine use (Bicchieri 2015).

Not only is the CLTS appealing from a theoretical point of view, but it is also very effective. For example, in 2005, it was conservatively estimated that 2000 communities in Bangladesh were 100% open defecation-free as a result of CLTS interventions (Kar & Pasteur 2005). In Indonesia, the Ministry of Health found the CLTS to be so successful that they changed ongoing sanitation projects mid-stream and made the CLTS the primary tactic for improving rural sanitation (Robiarto et al. 2012). CLTS interventions in Zambia have also met success—between 2007 and 2008, sanitation increased from 38% to 93% in 517 villages, 402 of which have been declared 100% open defecation-free (Galbraith & Thomas 2009). In Sierra Leone, 754 communities were triggered in 2009-2010, but only 169 of them have been declared 100% open defecation-free.[14]

5.5. Simple latrine construction: an ineffective open defecation intervention. The low levels of complete abandonment in Sierra Leone may be disheartening, but keep in mind that

established customs are hard to change. Defecating in the open is simply more convenient than defecating in private—it can be done any time and does not require the construction of a latrine. In order to be willing to change their behavior, people must develop a preference for latrine use.

Traditionally, many organizations and governments have attempted to curb OD by simply subsidizing community latrine construction (Sanan & Moulik 2007). These attempts have been widely unsuccessful, with the toilets eventually being abandoned or used for storage. Without the preference for latrine use, people will not be motivated to use them (despite their availability). Other interventions have focused on teaching individual households about the dangers of OD (Sanan & Moulik 2007). These attempts have also not been as successful, as even if some households are convinced that OD is detrimental to their health (and thus should stop engaging in it), not all households will necessarily be reached or convinced. (Remember that 100% abandonment is necessary for any meaningful improvement in health conditions to take place). Additionally, learning about the health benefits of latrines is not as motivating as learning about such benefits in conjunction with outside social pressure. We have stressed how a major change to customary scripts and schemata relevant to OD is important for effective change. It should be noted that such changes induce the creation of normative and empirical expectations that are the hallmark of a new social norm of latrine use.

5.6. Litterbugs, tossers, and chauvinist pigs. The introduction of novel linguistic terms is a common way to motivate compliance to a particular behavior. New terms such as "litterbug" and "chauvinist pig" have historically been used to motivate compliance with emerging and shifting norms. With the resurgence of the feminist movement in the 1960s and 1970s, activist women

coined the term "male chauvinist" (which eventually evolved into "male chauvinist pig") to "derogate the conviction of men that they were better than women" (Mansbridge & Flaster 2005, p. 261). The phrase soared in popularity, and soon many women reported using the term as a form of everyday activism to combat male discrimination.

The introduction of "male chauvinism" and "chauvinist pig" was intended to demonize what was originally seen as benign discriminatory behavior. These terms achieved the opposite of the Saleema campaign: they provided a novel schematic lens through which to process existing people and behaviors, but this time in a negative light. Their application sent clear normative signals that sexism was not acceptable, likely changing men's normative expectations about what was acceptable (particularly for the feminist reference group, who would be more likely to use the terms; Mansbridge & Flaster 2005). Indeed, in phone interviews, many women who had used the terms to describe acquaintances reported that it really had "made the men think and sometimes change" (Mansbridge & Flaster 2005, p. 263).

New linguistic terms have also been systematically used to encourage many other prosocial behaviors, such as not littering. Though "litterbug" is one of the more memorable antilittering descriptors, its effectiveness has not been well-documented. Fortunately, similar campaigns have been found to be effective (e.g., DEC 2005). For example, in 2002, Australia's Department of Environment and Conservation targeted roadside littering by introducing the "Don't be a Tosser" campaign, in which advertisements on television, the radio, taxis, and billboards all blasted the slogan (DEC, 2005). Tying the negative label of "tosser" to someone who litters served to make the act more of a transgression. It appeared to have worked. After the campaign, the term

"tosser" was commonly used to describe litterers (indicating that it had become a shared concept), and many people reported community members calling litterers "tossers" to their face, suggesting the term was being employed as an informal social sanctioning device. Importantly, the campaign was effective. Nearly twice as many people (81% up from 44%) reported not throwing trash from their cars, and the number of people who felt that vehicular littering was not relevant to them decreased to 15% (from 51%). A similar campaign was replicated in London in 2003, after which the city experienced an estimated 39% improvement in road cleanliness (Campbell 2007).

These are all examples of new ways of perceiving and judging existing behaviors that became increasingly common. In this respect, the schema of "good man" (or a "litterer") was ostensibly changed. The new schema involved different normative expectations and even the introduction of new sanctions for newly transgressive behaviors. In this respect, one could claim that a new norm was created as part newly emerging scripts and schemata. We see this change as an example of the bookkeeping model of schematic change: the terminology was introduced and used continuously, spreading to more and more individuals so as to become a household term.

5.7. Soap operas: a catalyst of social change. Soap operas, what may strike many as a banal pastime, have been credited with the induction of a considerable range of behavioral and attitudinal change (e.g., Brown 1990; Brown 1992; Jensen & Oster 2009; La Ferrara et al. 2008; Paluck 2009a; Rogers et al. 1999; Trujillo & Paluck 2012). These shows present viewers with characters who are easy to identify with yet frequently deviate from maladaptive behavioral patterns. In many respects, the characters that viewers observe when watching certain soap

operas are the perfect instances of schema-discrepant information. They are largely prototypical to a particular social group, yet they often deviate in specific, unambiguous, and positive ways.

According to the narrative transportation theory, even though such characters and stories are obviously fictional, they can still feel real enough to the viewer to be persuasive (Green & Brock 2000; Green et al. 2004). When narratives are sufficiently immersive, they functionally replace the viewers' reality with the fictional one, thereby opening up the door to belief (and schema) change. When viewers identify with particular characters, they see "the character's perspectives as [their] own, [and] share his or her existence," and thus vicariously experience their discoveries (Green et al. 2004, p. 319). The more frequently particular characters are encountered, the more connected viewers feel with them (assuming they support the characters' moral agenda—the opposite may be true if they reject it; Green et al. 2004).

The behavioral impact of soap operas is typically both substantial and positive, impacting diverse social phenomena ranging from fertility rates in Brazil, to appreciation for women's rights and autonomy in India, to family planning and intergroup relations in Africa (e.g., Brown 1990; Brown 1992; Jensen & Oster 2009; La Ferrara et al. 2008, Paluck 2009a; Rogers et al. 1999; Trujillo & Paluck 2012). Here, we will present and review both theoretical considerations and empirical evidence to show that soap operas induce schema, script, and ultimately, social norm change.

Between 1960 and 2000, Brazil's total fertility rate dropped from 6.3% to 2.3% (Lam & Marteleto 2005). La Ferrara and colleagues (2008) convincingly argue that this drop in fertility is

largely due to a combination of increased television ownership (from 8 to 81% between 1970 and 1991) and increased soap opera broadcasting levels. Telenovelas, which are currently watched by between 60 and 80 million Brazilians of a range of socioeconomic classes, were (until quite recently) exclusively broadcasted by the Rede Globo corporation (La Ferrara et al. 2008). They were made available to watch on a region-by-region basis as Rede Globo coverage expanded. As their plots typically involve five or so families, the number of children each family has is unrepresentatively low in order to keep the number of characters manageable.

The advent of Rede Globo coverage in an area was followed by significant drops in fertility rates (La Ferrara et al. 2008). Additionally, the more time that had passed since Rede Globo started covering an area, the lower the birth rates tended to be. These effects were stronger for women of the same age as the telenovela protagonists (mostly women in the mid to late stages of their childbearing life) and from lower socioeconomic classes (for whom literacy rates are lower and television is one of the few accessible mediums of information transmission other than interpersonal communication).

This reduction in birth rates is not just due to television exposure, but to specific exposure to the reality portrayed in Rede Globo's telenovelas (La Ferrara et al. 2008). Specifically, if a family gave birth to a child in an area covered by Rede Globo, there was a 33% chance they would name him or her after one of the main novela characters, but if they lived outside such an area there was only an 8% chance. Additionally, increased coverage of other stations had no impact on birth rates.

These shows stress not only feature female protagonists with few children, but they tend to stress values including freedom, personal wealth, and female empowerment in the work world, amongst others (La Ferrara et al. 2008). They were presented in the form of an alternative lifestyle that featured few children and plenty of disposable income. La Ferrara and colleagues (2008) observe that "constant exposure to smaller, less burdened television families, may have created a preference for fewer children and greater sensitivity to the opportunity costs of raising children" (p. 9).

Not only do these telenovelas project prosocial messages and values, but audience members find the soaps' characters easy to identify with (Brown 1992; Tufte 2004). Brazilian telenovelas involve personally relevant and highly relatable everyday experiences, and this is true of many soap operas in developing countries (Brown 1992). In other words, the characters on the telenovelas appear to be largely prototypical of the particular segments of their viewer base that they portray. That is, they conform to schematic expectations for the most part, yet they deviate in several positive and unambiguous ways. The characters present lifestyles of relevant social groups that are similar enough to reality to be relatable, yet deviant enough to shift one's schematic expectations.

Assuming the soap opera characters are indeed largely prototypical with several notable exceptions (which appears to be the case), then they would likely induce schematic adjustment in the social groups with which they are associated rather than being subtyped and understood as "an exception to the rule." Recall that schema-defiant instances that are largely prototypical are harder to subtype. As there are many different telenovelas that people can watch that all feature

the same relevant qualities (relatable characters that deviate from expectations in similar positive ways) and these schema-defiant qualities are repeatedly observed each time one watches an episode, we contend that the type of schema change that is likely occurring would be best modeled by the bookkeeping model of schema change.

Recall that women in the later stages of their reproductive life were the ones who experienced the most pronounced drop in birth rates in La Ferrara and colleagues' (2008) study. We suspect that this disparity in birth rate change is due precisely to the fact that women who were and are featured on the telenovelas (who have few children) match this older age profile. Women of all ages who watch these shows likely update their schematic understanding of the type of woman featured in the shows, but such a schematic readjustment is not as relevant to the younger women. Indeed, women between the ages of 15 and 24 actually experienced no significant change in birth rates between 1970 and 1991 in La Ferrara and colleagues' (2008) study.

For the relatively older women, the alternate life path of having a career and fewer children would seem much more reasonable and appealing once they update their schematic understanding of the group with which they identify. Prior to this revision, if their schema for a woman like themselves exclusively featured a large family and no substantial career, then choosing to have a smaller family would defy those "legitimate" expectations. One might worry that engaging in such a lifestyle and choosing a career over a large family would be seen as deviant and incur a negative judgment from one's peers. Telenovela viewership both legitimizes and even idealizes such an alternative lifestyle. However this legitimization may be seen as relevant only to the older age group who the characters represent.

While the fertility changes reviewed by La Ferrara and colleagues (2008) occurred incidentally, other soap operas were explicitly designed to induce social change (Brown 1992; Tufte 2004). For example, in a study on Latin American attitudes towards the U.S. census, Trujillo and Paluck (2012) experimentally demonstrate similar findings by showing that a well-liked character's behavior in a soap opera (*Más Sabe El Diablo* or *The Devil Knows Best*) could influence both the audience's attitudes and behavior. Similarly, *Hum Log* (*We People*), a show that was developed in India to promote respect for women, acceptance of cultural diversity, and other values met with considerable success (Brown 1992; Singhal & Rogers 1989). Increased viewership fostered increasingly strong links among positive social figures, positive life outcomes, and positive ideologies in viewers' semantic networks.

By employing longitudinal survey data in several regions of rural India, Jensen and Oster (2009) found that the advent of cable television access was associated with lower female acceptance rates of spousal abuse, a diminished preference for sons, greater levels of female autonomy (as measured by levels of female household decision-making), and lower fertility rates. Similar to the Brazilian telenovelas described earlier, Indian soap operas typically feature both educated, urbanite families and liberated female characters who marry later and have fewer children. Unfortunately, Jensen and Oster (2009) did not indicate whether the audience members identified with the soap opera's characters. However, other authors have suggested that Indian audience members do indeed identify with the soap opera's characters and incorporate elements of what they observe on television into their own behavior and sense of self (e.g., Johnson 2001; Scrase 2002).

The elements of social change that Jensen and Oster (2009) investigate are particularly relevant with respect to the changes in acceptance of domestic violence, which were assessed by asking female participants whether they thought that a husband is justified in beating his wife in a variety of situations. Most women answered that they felt it was justified in at least one situation (such as when "she does not cook food properly" – see Jensen and Oster for further detail; 2009, p. 1068). Each instance in which they thought domestic violence was justified could be interpreted as both a violation of the "good wife" schema and a triggering cue for the "domestic violence" script. If after being exposed to cable television, women are decreasing the number of behaviors in which they believe domestic violence is an acceptable response, then either their "domestic violence" script is changing or their "good wife" schema is changing. This hypothesis is partly speculative (explicit script and schema measurement would be needed to ascertain the structure of the "good wife" schema and triggering cues of the "domestic violence script" with certainty), but it makes sense given the available data.

In support of a causal relationship between schema change and behavioral change, Rogers and colleagues (1999) demonstrate with a quasi-experimental field study that exposure to a radio soap opera (*Twende na Wakati* or *Let's Go with the Times*) effectively promotes discussion about, positive attitudes towards, and use of family planning practices in Tanzania. We suspect that these changes were largely driven by the formation of new links between existing schemata. Many Tanzanians (46%) listen to the radio at least once a week but have limited exposure to other media (Rogers et al. 1999), making the country a relatively controlled environment for a radio intervention.

In *Twende na Wakati*, unambiguously positive and negative role models are featured who respectively adopt or reject family planning practices and attitudes. For example, Mkwaju, a promiscuous, alcoholic, and chauvinistic truck driver has sex with many prostitutes, steals to support his many mistresses, and ultimately loses his job, wife, and even life after contracting HIV/AIDS (Rogers et al. 1999; Slater 2002). Most listeners identified with the positive role models but few identified with the negative role models. Identification with positive models increased over time, and the limited identification with negative models decreased over time. The longer listeners followed the show, the stronger their links between the sexually unsafe behaviors featured in the show and the negative life outcomes in their semantic networks became (e.g., between "unprotected sex" and "venereal disease" or "death" if such links did not already exist).

All the areas of Tanzania that Rogers and colleagues (1999) tested were exposed to government-sponsored informational messages in support of family planning, but only treatment areas received coverage of *Twende na Wakati*. Most listeners in the treatment area felt positively towards the show and indicated that they learned about family planning, how to prevent HIV/AIDS, the dangers of alcohol abuse, and the importance of spousal communication from listening to it. More importantly, self-reported family planning adoption by married women increased by roughly 10% in the treatment areas, and such levels decreased by 11% in the control areas over the experimental period. 25% of new family planning adopters at health clinics across the country indicated *Twende na Wakati* as their main reference in adopting family planning.[15]

By specifically comparing those who listened to *Twende na Wakati* to those who did not within treatment areas, the differences become much more pronounced. Forty-nine percent of married women who actually listened to the show adopted family planning practices as compared to 19% for those who did not listen, and adoption rates of female listeners increased to 64% if they talked about the family planning content of the soap opera with their spouses (similar increases Rogers et al. 1999). High levels of communication with spouses and general others (which was also reported, especially in response to discussion questions posed at the end of each episode) would make it easy to infer how relevant others feel about a particular matter, thereby facilitating a shift in normative expectations. Interestingly, exposure had no impact on awareness of family planning methods, which was already high at the beginning of the intervention. Here, we see how purely informational campaigns might not be enough to change important structural elements of family planning schemata. Instead, the availability of a long-term show that presented models of action and characters that easily fit into societal roles became crucial in changing the listeners' empirical expectations about the possibility and, indeed, advisability of adopting new practices. Not only were links between family planning and other elements of listeners' semantic network likely formed, but the public character these shows helped people realize that many others are listening and induced discussion among friends who follow the same program.

6. Conclusion

We have reviewed many instances of how the proposed relationship and dynamics among scripts, schemata, and social norms can be used to explain the efficacy of a range of

interventions. To enact norm change, it would be necessary to induce a shared, collective change to the trigger cue, the script, or to provide shared alternative schemata or scripts to process the situation (in the case of schemata) or guide one's behavior (in the case of scripts). We focus on the cognitive underpinnings of norm activation and change. Norm dynamics is a highly complex process that also necessarily involves a change in social expectations (empirical and normative). These social expectations are fundamentally grounded in shared social schemata for relevant reference groups. Providing an adequate model of norm change cannot avoid the scripts and schemata story, but it must also address the role of trendsetters in initiating change and the nature of the mechanisms that coordinate change (Bicchieri 2015).

We have considered interventions aimed at changing collective practices. Any such intervention should be supported by a meaningful theory. A particularly important theoretical element is the rich web of scripts and schemata in which these practices are embedded. Taking steps to understand this web and its elements should constitute a critical first step when designing effective behavioral interventions. Existing interventions that have inadvertently tapped into this intuition have met with considerable success. Just imagine how effective they could become if they were explicitly designed with script or schema change in mind.

Acknowledgements

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[1] This will not be the case with a moral norm, where preferences for following such a norm are typically socially unconditional.

[2] Most of what we say will also apply to descriptive norms (see Bicchieri 2006, Chapter 1).

[3] He was specifically referring to ethnic categories when he said this, but we think his quotation applies to social categories and social schemata in general.

[4] This proves to be particularly problematic for social norms, as the stimuli that activates a norm are often highly social in nature.

[5] Defined as "a cognitive structure that contains the perceiver's knowledge, beliefs, and expectancies about some human group" (Hamilton & Trolier 1986, p. 133)

[6] We consider a "prototype analysis" to be the best way to measure a schema. Such measurement will be important when attempting to determine the structure of a schema for a population and the degree to which such a structure is shared. (For relevant work on prototype analyses, see Fehr 1988; 2005; Le et al. 2008.)

[7] In fact, cognitive therapy largely relies on alternative schemata as replacements when attempting to reduce reliance on maladaptive ones (Padesky 1994).

[8] Also known as female genital mutilation (FGM).

[9] While the Tostan's initiative has been touted as very successful in Senegal, questions have been raised whether it is effective elsewhere. We will not be addressing the debate over their methods' efficacy, but rather just discussing their model, which is of interest from our theoretical perspective.

[10] We are thankful to Molly Melching, the founder of Tostan, for illuminating discussions on this issue.

[11] See also the School-Led Total Sanitation program (e.g., Adhikari & Shrestha 2008).

[12] It is worth noting that, from a psychological perspective, disgust (especially when elicited by exposing people to fecal matter) is a particularly motivating emotion and one that is effective at making something seem "wrong." That is, research has demonstrated that humans find fecal matter inherently disgusting, and disgust is an emotion that people readily associate with morality (e.g., Curtis 2007; Schnall et al. 2008).

[13] We say "script" here as we are specifically referring to private defecation as an event. Open defecation is also a loose script, without having highly ordered action elements. However, as we are more interested in open defecation as a general concept, we have referred to it as a schema—technically either term is applicable.

[14] Many more of these communities have experienced reduced but not entirely eliminated rates of defecation. It is critical that these communities experience 100% abandonment, as even a small number of people defecating in the open can trigger similar levels of disease transmission as if the whole community engaged in the practice (Sanan & Moulik 2007).

[15] Presumably, any measurable differences between the control areas (that did not receive *Twende na Wakati* coverage) and treatment areas were due to differences in exposure to the radio soap opera. The authors conducted interview surveys in all areas before the broadcasts began (1993) and at one-year intervals up through 1997. They also gathered additional data from 79 health clinics across the country, performed script analysis on the content of the 305 episodes, analyzed letters that listeners sent into the radio station (which they were encouraged to do at the end of each show), and analyzed annual content from Tanzania's Demographic Health Survey (TDHS).