

It's contagious: Rethinking a metaphor dialogically

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Abstract

“Contagion” appears frequently in peer-reviewed articles and in popular media to explain the spread of ideas, feelings, and behaviors. In the context of social science, however, we argue that this metaphor leads to magical thinking and should be described as a simile, rather than a metaphor. We review literature on “social contagion” using the dialogical paradigm and conclude that peer-reviewed claims tend to correspond with imagined realities from epidemiology rather than social science, including assumptions of passive and linear microbial spread, as well as pathology. We explore case studies on the spread of laughter, riot behavior, and “mass psychogenic illness,” and find that social contagion involves social meanings negotiated at the level of persons and groups that are uncharacteristic to the spread of diseases. Dialogism is presented as a correction to the epidemiological paradigm.

Keywords

Dialogical theory, contagion theory, psychogenic illness, spread, metaphor, riot behavior, laughter, Bakhtin, Afghanistan, dialogism

Introduction

In February 2012, the Le Roy School District in Le Roy, New York, reported a “twitching disease” that affected over a dozen teen girls and at least one adult. The New York Department of Health launched an investigation in search of environmental causes, and environmental activist Erin Brochovich sent a team

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to investigate. The school report concluded, "Extensive research, examination, and testing have revealed...no environmental or infectious cause for this ailment" (Cox, 2012, p. 1). Yet, doctors treating the girls reported that the tourette-type symptoms were evidence of "mass hysteria" that may have been "spread by social media" (Dube, 2012).

Language of "disease" and "epidemic" spread for social phenomena is nothing new. Rust (1999) reports that the Saint John's dance mania began in medieval Europe and appeared in multiple cities between the 14th and 18th centuries. It was characterized by groups of people, sometimes thousands at a time, dancing spontaneously through streets of towns, often until collapsing of exhaustion. Famous outbreaks include one in Aachen, Germany, in 1374 and the dancing plague of 1518. According to mid-19th century physician Dr. Justus Hecker (1837), who wrote a book on the pandemic, these were "propagated in epidemic fashion by sight":

It was a convulsion which in the most extraordinary manner infuriated the human frame. ...It did not remain confined to particular localities, but was propagated by the sight of the sufferers, like a demoniacal epidemic, over the whole of Germany and the neighboring countries to the northwest. (p. 12)

For Hecker, as well as other early theorists like Le Bon (1903), social contagion was akin to social pathology:

Peasants left their plows, mechanics their workshops, house-wives their domestic duties, to join the wild revels, and this rich commercial city became the scene of the most ruinous disorder. Secret desires were excited, and but too often found opportunities for wild enjoyment... Girls and boys quitted their parents and servants their masters, to amuse themselves at the dances of those possessed, and greedily imbibed the poison of mental infection. (Hecker, 1837, pp. 3-4)

An epidemiological paradigm attributes the abandonment of social duties, "Peasants left their plows," "Girls and boys quitted their parents," with "infection." It describes behavior that upsets or disorders social hierarchy with metaphors of sickness. The cause is deemed psychogenic and unknown.

In April 2012, journalist Matthew Aitkens (2002) used similar language to describe a series of incidents at girls' schools in Takhar province, Afghanistan. According to reports, 161 Afghan girls fell ill at a high school in Taloqan, reporting symptoms of dizziness, fatigue, and anxiety. School officials believed they were sick from something in the school's water well, and local female doctors were imprisoned on suspicion of poisoning the water. Samples of the water were sent to a North Atlantic Treaty Organization (NATO) laboratory in Kabul, where investigators found no traces of poison. Less than a month later, at Bibi Hajira girls' high school a few miles away, 127 girls again were taken to the hospital with symptoms of dizziness, anxiety, and cases of fainting. Local authorities were convinced that the Taliban had poisoned their

water. Again, however, medics could determine no “cause,” the lab results for poisoning were negative, and the girls were all released from the hospital. Local medics suggested this was a case of mass psychogenic illness. “Ground Zero,” they said, was a girl with epilepsy who suffered a seizure while fetching water from a school well. Her sudden illness triggered mass panic and social contagion.

The risks of a metaphor

Much has been published in academic journals using rubric of “social contagion,” as well as “infectious psychogenic illness” (see Table 1). This research uses metaphors borrowed from epidemiology to describe the spread of complex human behavior, beliefs, representations, and ideas (e.g. Sperber, 2000). Princeton University researchers Cannarella and Spechler (2014) recently claimed that precedents for using epidemiological models in other domains are “well established,” and cite as evidence Bartholomew (1984); Goffman (1966); Watts (2002) and Bettencourt, Cintern-Arias, Kaiser, and Castillo-Chavez (2006). “Ideas, like diseases,” they conclude, “have been shown to spread infectiously between people before eventually dying out, and have been successfully described with epidemiological models” (p. 1). The Princeton researchers further suggest that there may be ways to “immunize” a population “infected” with an idea through computational modeling of the contagion. However, these models only work if ideas spread the way diseases do, for the same reasons. They are not diseases and do not spread for the same reasons that diseases spread, through mere contact. Place Helen Keller in a room with two persons, one person with a contagious idea (or twitch, or laugh, or dance) and one person coughing from influenza, and the only thing she will catch is a cold. Place a group of dance-crazed Europeans in a Taliban-controlled district of rural Afghanistan, and no one will dance in the street with them. (Instead, the dancers might be arrested or stoned, and perhaps stoning behavior would spread like a contagion.) Ideas, beliefs, and behavior are normatively regulated and made up of meanings and symbols, whereas diseases are made of biological agents, and the mechanisms of transfer are different.

The word contagion is itself a symbol that has spread in the social sciences at rapid rate. In a recent edition of *Clinical Psychological Science*, for example, Haefel and Hames (2013) report findings that depression is “contagious” among college students. The mere presence of depression in one roommate increases the likelihood of depression in another, they say, and this is why it is called “contagious.” They further suggest that some individuals have more “cognitive vulnerability” to contagion than others, and that this research “opens the door for an entirely new line of research” (p. 81). However, it does not.

To illustrate, we review several applications of social contagion theory in social science. In doing so, we address two assumptions made in claims such as those by Haefel and Hames: (1) that contagion is a measurable phenomenon, an assumption based very much in the biological sciences, and (2) contagion spreads in a comparable fashion to the contagion of a sickness. Both assumptions are

Table 1. Illustrative studies of social contagion.

	Authors	Type(s) of social contagion	Research approach	Conceptual model (linear/dialogic/hybrid)
1	McDougall (1920)	Crime	Conceptual/theoretical	Linear
2	Blumer (1939)	Crazes, manias, fads, financial panic, patriotic hysteria	Conceptual/theoretical	Linear
3	Milgram, et al. (1969)	Crowd formation	Quantitative	Linear
4	Russel, et al. (1976)	Jaywalking	Quantitative	Linear
5	Stephenson and Fielding (1971)	Social rule violation	Quantitative	Linear
6	Kerckhoff and Back (1968); Cohen, et al. (1978); Colligan and Murphy (1982)	Psychogenic illness	Qualitative and quantitative	Dialogic
7	Goethals and Perlstien (1978); Wheeler and Levine (1967) Wheeler (1966)	Aggression in response to socially undesirable opinions	Quantitative	Linear
8	Freedman and Perlick (1979)	Expressions of appreciation	Quantitative	Linear
9	Pennebaker (1980)	Coughing	Quantitative	Linear
10	Freedman, Birsky, and Cavoukian (1980)	Expressions of enjoyment	Quantitative	Linear
11	Freedman, et al. (1980)	Applause	Quantitative	Linear
12	Kirby and Corzine (1981)	Stigma	Qualitative	Linear
13	Phillips (1983); Sheehan (1983)	Aggression in dispersed communities exposed to mass media	Quantitative	Linear
14	Rozin and Nemeroff (1990, 2002); Rozin, Millman, and Nemeroff (1986)	Disgust	Quantitative; conceptual	Linear
15	Crandall (1988)	Binge eating in sororities	Quantitative	Linear
16	Sullins (1991)	Mood convergence in a waiting room	Quantitative	Linear
17	Rowe, Chassin, Presson, Edwards, and Sherman (1992); Ritter and Holmes (1969)	Restraint reduction and teenage smoking	Quantitative	Linear
18	Rogers and Rowe (1993)	Sex among youth	Quantitative	Linear
19	Levy and Nail (1993)	Hysterical contagion, echo (or imitation) contagion, disinhibitory contagion	Quantitative	Linear

(continued)

Table 1. Continued

	Authors	Type(s) of social contagion	Research approach	Conceptual model (linear/dialogic/hybrid)
20	Behnke, Sawyer, and King (1994)	Anxiety	Quantitative	Linear
21	Rogers (1995); Bass, Mahajan, and Muller (1990)	Consumer behavior	Quantitative	Linear
22	Jones and Jones (1995)	Criminality	Quantitative	Linear
23	Ennett, Flewellin, Lindrooth, and Norton (1997); Rowe, Chassin, Presson, Edwards and Sherman (1992)	Substance abuse (alcohol, cigarettes, marijuana)	Quantitative	Linear
24	Gump and Kulik (1997)	Fear	Quantitative	Linear
25	Jones (1998)	Delinquency	Quantitative	Linear
26	Marsden (1998)	Self-Harm, Aggression, Social Rule Violation, Consumer Behavior, Financial Behavior, Hysterias	Conceptual/theoretical	Linear
27	Lux (1998); Temzelides (1997)	Financial investing	Conceptual/theoretical	Linear
28	Bakker and Schaufeli (2000); Bakker, LeBlanc, & Schaufeli (2005)	Occupational burnout among teachers, nurses	Quantitative	Linear
29	Rozin and Nemeroff (2002); Rozin, Millman, and Nemeroff (1986)	Perceived transfer of a physical, mental, or moral "essence" from a source to a target	Quantitative	Linear
30	Videan, Fritz, Schwandt, Smith, & Howell, et al. (2005)	Expressions of aggression or affiliation among chimpanzees	Quantitative	Linear
31	Beer (2007)	Political attitudes, ideas, and behaviors	Conceptual/theoretical	Linear
32	Loersch and DeMarree (2008); Henk, et al.(2004)	Goal contagion	Quantitative	Linear
33	Rozin and Wolf (2008)	Land attachment	Quantitative	Linear
34	Warren, et al. (2009); Provine (2000)	Laughter	Quantitative	Linear
35	Dezecache, Conty, Chadwick, Philip, Soussigan, Sperber, and Grèzes (2013)	Emotional contagion	Quantitative	Linear

incorrect. For the first, “contagion” is a metaphor used as an adjective, and not a scientific measure. Metaphor, Stanley Kune (1979) wrote, works by “creating or calling forth the similarities” between one thing and another (p. 533). One may say that depression spreads like a sickness, but the spread of a sickness can be measured in a Petri dish, whereas no cells carry depression, even if the condition of depression is embodied with correlates in cellular organization. If depression is not an epidemic infection, it therefore cannot be described mathematically using measures of epidemic threshold and critical mass dynamics for contagion, for example (see, e.g. Dietkmann & Heesterbeek, 2000; Dodds & Watts, 2004). Yet, models of social contagion continue to be used to explain the spread of disgust, fear and anxiety, and many other emotions and conditions that are not primarily microbial in origin. Both Haefel and Hames (2013) and Cannarella and Spechler (2014) further suggest that the spread of the idea can be contained the way biological agents are contained, such as quarantine or forms of immunity.

Metaphors are important in the social sciences (see Macpherson, 1999), but the problem is that while they reveal, they also conceal. The word metaphor is derived from the Greek *metaphora*, to transfer, and one of the functions of metaphors in communication is to transfer the qualities of one thing to another. To say, “All the world’s a stage” is to transfer the qualities of theatre to life, for example. But metaphors also convey assumptions from their original contexts that may not fit their new context. Natural science metaphors in particular have a half life when applied to the social sciences. Applying metaphors from the biological domain to the domain of culture, communication, and social interaction rarely increases the metaphor’s explanatory power and in many cases, weakens it. Bennett and Hacker (2003) illustrate the reverse of this in the mereological fallacy, where metaphors of human and social experience are applied to neuroscience. To say that the brain “thinks,” the hippocampus “remembers,” and neurons “talk,” is intuitively revealing, yet also conceals how the brain really works at the level of cells and biology. In the same way, depression is not contagious. Rather, depression spreads like a contagion. That small shift, from a metaphor to a simile, is enough to reduce the risk of magical thinking and imaginative leaps that metaphor tends to invite.

The second assumption of social contagion theory is that social contagion is comparable to microbial contagion. For this to be true, the objects of natural science models should be comparable to the subjects of social science. However, the comparisons are limited (see Power, 2015). Feelings, behaviors, and thoughts are not generated or replicated the way the HIV/AIDS virus is generated and replicated. There are elements in subjects that are absent in objects, such as meaning, language, and social context. A microbe is not conscious of itself. The contagious spread of Ebola requires only contact with bodily fluids, whereas the spread of laughter requires a complex combination of voluntary and involuntary behavior and shared affect. While it is nonetheless tempting to suggest that depression is spread “via contagion” (see Haefel & Hames, 2013, p. 81), it is also true that depression is not caused by a metaphor.

On the one hand, this appears to be mere semantic debate. All metaphors are imprecise, and to call something contagious is to suggest it can spread rapidly from person to person. On the other hand, the contagion metaphor continues to be taken seriously as a substantive claim in various journals and is used to explain the spread of speeding while driving (Connolly & Agberg, 1993), the spread of goals (Henk, Gollwitzer, & Hassin, 2004), the spread of emotions (Kevrekidis, Skapinakis, Damigos, & Mavreas, 2008; Lundqvist, 2008), and the spread of “psychogenic illnesses” through social media (Dube, 2012). One of the authors of the present article is complicit, having argued that laughter among children is “contagious” (Warren, Etkoff, Wood, Taylor, & Marci, 2009). Contagion is a metaphor that unnecessarily simplifies complex human behavior. As a metaphor, it appeals to the imagination. Metaphor is a language of romance and magic. Shakespeare’s Juliet would not have been wooed if Romeo had said to Juliet, “Thy eyes are. . . like eyes. And thy lips. . . like lips.”

These are neither new nor trendy, however, as biological metaphors of contagious spread have long held appeal in social sciences. One of the earliest uses appears in LeBon’s description of mass hysteria in 1903. Decades later, contagion was used to explain a wide array of phenomena in psychiatry (Redl, 1949), sociology (Blumer, 1939), and psychology (Levy and Nail, 1993; Marsden, 1998). What the metaphor conveys is a powerful image of spread and what it lacks is explanatory power. Many have written “toward a theory” (Wheeler, 1966), or to “revisit” a theory (Sullins, 1991) about contagion, and Doherty (1997) even developed a scale, but each time, same empirical and epistemological weaknesses resurface and so-called “lines of research” are dropped in the water. Contagion is a metaphor and not a measure. Microbes are objects, rather than subjects.

In this article, we argue that a wide body of research on ‘social contagion’ should be rethought using a new set of assumptions, designed for the social sciences. These assumptions are “dialogical,” a term introduced in the late 19th century by Mikhail Bakhtin in his work on literary theory, because they hold interactions to be more interesting than static one-way communications. Dialogical assumptions have been applied to the study of interactions within the self (e.g. Hermans, 2001), to interactions between individuals (e.g. Gillespie, 2011), to interactions between individuals and groups (see Bakhtin, 1981), and to interactions between groups (Power, 2011). These are increasingly used in social-psychological (Marková, 2003), neuropsychological (Thibault, 2000), and socio-logical (Camiac & Joas, 2003) analyses. While dialogic applications and approaches differ, we refer to this body of work collectively as the dialogical paradigm (see Gillespie & Cornish, 2014; Hermans, 2001; Linell, 2009; Marková, 2003; Märtsin, Wagoner, Aveling, Kadianaki, & Whittaker, 2011). The dialogical paradigm characterizes human thoughts, behaviors, and feelings as dialogues that take place between and within persons and groups. In simple terms, dialogue is characterized by communication and meaning-making, without specifying further whether these are conscious or unconscious, verbal or non-verbal, within a person or between persons. A dialogical paradigm approaches the contagious

spread of a behavior, such as laughter, and asks questions about how laughter is meaningful to those participating in it, who the laughter is performed for, and how the laughter is involved in meaning-making for those participating in it. This is important because the use of a pathologizing paradigm increases the risk that persons or ideas are represented as passive agents onto which meanings of victimhood or aggression can be assigned by in-power groups, such as media, police, or governments.

Theories within the dialogical paradigm include theories of inter-group analysis, such as the theory of dialogic action (Freire, 1970), theories of analysis between persons and groups, such as the theory of dialogic imagination and dialogic learning (Bakhtin, 1981; Koschmann, 1999), and theories focused on within-person, I–Me conversations, such as Dialogical Self Theory (Hermans, 2001; Soler, 2004). The dialogical paradigm corrects epidemiological metaphors because only persons and groups can dialogue. Viruses, bacteria, and biological agents cannot make meaning out of their social world the way persons do and do not negotiate and choose to participate in “contagion” the way humans do. To illustrate, we begin by reviewing the earliest applications of the contagion metaphor, demonstrating how an epidemiological paradigm regards “transmission” of behaviors and ideas as passive, linear, and pathological. We highlight how it has contributed to pseudo-science claims about sexual hysteria, the spread of mob behavior, and dancing crazes, for example.

Review of contagion claims

Observed contagion was documented in the late 19th century for “hysteria” and has been studied empirically in social science since in the mid-20th century. Research has largely focused on the spread of behaviors considered undesirable or problematic such as sickness, smoking, and rioting. With few exceptions, it has assumed a linear, passive, and pathological, microbial model for understanding contagious spread. These claims tend to coincide with quantitative, rather than qualitative, methods of analysis, as illustrated in Table 1.

When Le Bon (1903) proposed contagion as a topic in social psychology in his seminal book, *The Crowd*, he focused his analysis on the hysteria of angry mobs. Le Bon called it a “phenomena of a hypnotic order” (p. 33). Those experiencing contagion were under a kind of spell, hypnotized and therefore unable to control their own behaviors. Social contagion for Le Bon and a handful of thinkers before him, including Hippolyte Taine, was akin to transfer of a disease. Analysis therefore focused on understanding behavioral epidemics, and the goal or purpose was to devise a method of treatment. By transferring the metaphor from epidemiology to social science, LeBon transferred the assumption that a study of contagion is a study of disease. Also transferred was the idea that social contagion might be treated like a disease and explained using epidemiological terms like pathogen, sickness, quarantine, immunity, infection, and vulnerability.

Stott and Drury (2012) suggest that this epidemiological model helps explain why governments and right-wing political media use the contagion metaphor to explain the spread of behavior during rioting. In-power groups such as the government or police force can represent events such as the recent UK riots in August, 2011, as being senseless acts of “contagious violence” committed by “madmen” and “hoodlums” who are “sick” and have no justifiable or legitimate reasons for rioting. By representing rioters and the spread of violence during a riot using a pathological model, governments can distance themselves from any implication in the riots such as the creation and enforcement of negative or ineffective socio-economic policies. By implying that rioters are “sick” or “diseased,” this metaphor removes responsibility from the actions (or inaction) of government agents (e.g. the police) in the inception and proliferation of violent rioting (Reicher and Stott, 2011).

Behaviors (e.g. rioting, in Reicher & Stott, 2011) and ideas (e.g. “the world is flat,” in Russell, Wilkins, & Jenkins 1997) do not spread in a senseless manner (see also Drury and Reicher, 2009; Gillespie, 2008; Moscovici, 1976/2008; Reicher, 1996). If they did, we would not be able to explain why some “catch” them and others do not. We would be unable to explain how, and why, contagious behavior, such as rioting, eventually stops. Microbial metaphors of linear, passive, pathological spread are therefore sometimes antithetical to complex explanations. For instance, if a behavior is inherently contagious, it makes no sense to factor in social positioning theory (see Harré, Moghaddam, Cairnie, Rothbart, & Sabat, 2009), which assumes that social position, social meaning, and social norms play a role. The pathological model of spread is therefore overly simplistic and incomplete (Drury and Reicher, 2009; Stott and Drury, 2012). Researchers interested in “social contagion” should assume that socio-cultural and historical norms, meaning systems, and social position influence the interpretation, expression, and spread of contagion. We know, for example, that crowd behavior can be understood in complex terms of an individual’s “conformity to salient local [group] norms” using the social identity model of deindividuation effects (SIDE) (Reicher, Spears, & Postmes, 1995), and in response to pre-existing emotions and goals, both conscious and unconscious. A contagion model would identify members of the crowd as ‘infectors’ and those exposed as ‘infected,’ revealing nothing.

There are also errors in the attribution of cause. Underlying mechanisms of “cause” in natural science are often different than social science. Contagion is consistent with empiricist models of causation, such as advanced by David Hume, where “cause” is reduced to directly observable events that are immediately coincidental in time and locally proximate in space (e.g. one billiard ball making contact with another) (see Collingwood, 1938/1961; Hart & Honore, 1956/1961). A disease such as tuberculosis is contagious because person A coughs and person B becomes sick. Cause and effect are clear and passive. Yet, psychological behaviors, thoughts, and feelings involve meaning-making, and at multiple levels: within a person, between persons, between persons and groups, and between groups.

At each stage, human beings negotiate meaning in a way that biological agents do not. This is how we can explain why many appearances of contagion ultimately stop, and why some individuals “catch” the idea, feeling, or behavior more than others, if at all.

A dialogical paradigm, we argue, corrects the troubles caused by an epidemiological metaphor. It does this by assuming that relationships involved in the spread of a behavior, thought, or feeling, are dynamic rather than linear. This means that the actions of one group affect the response from the other (see Power, 2011; Power & Peterson, 2011). It also assumes that relationships are mediated by signs and assume alterity: the self is always bound to “others,” such that both mutually constitute each other (Bell & Gardiner, 1998; Marková, 2003; Märtsin, et al., 2011). To illustrate we briefly review two cases of behavior “epidemics”: riots and laughter. We first describe each case as originally represented in the literature, then we apply the dialogical paradigm to reconsider the findings. These are meant to be illustrative and not an exhaustive application of different theories within the dialogical paradigm.

Riot epidemics

According to Reicher and Stott (2011), the immediate governmental reaction to the UK riots in August, 2011 was to represent the rioters as “mindless”, “thugs” and “criminals,” who randomly attacked and burned buildings in English cities and had no legitimate cause for protest. It was assumed that violence spread contagiously in a linear fashion from one person to another and would need to be controlled by force or quarantine. However, Reicher and Stott explain that the initial riot, initiated on 6 August 2011, was perpetuated by the Tottenham police failing to adequately communicate with a group of protestors who had gathered outside their local police station. The protestors were seeking answers to the previous day’s shooting by police of an unarmed man named Mark Duggan. More recently, a similar series of events seems to have sparked the recent riots in Ferguson, Missouri, where an unarmed man named Michael Brown was shot by the police force. Police also are widely reported to have failed to adequately communicate with the family of the victim.

Reicher and Stott’s analysis suggests that the failure of the police to treat the protestor grievances as legitimate, rather than ‘senseless’ or ‘crazed,’ led to an in-group consolidation of protestor anger. When police tried to disperse the crowd, this in-group solidarity spilled out into violence. The crowds’ social identity changed from a heterogeneous group of protestors to a homogenous group of rioters. Reicher and Stott’s analysis further reveals how the rioters regulated the riots: certain buildings were targeted and others were not. When ‘legitimate’ buildings were set ablaze, the researchers suggest, rioters helped to evacuate people from adjoining apartments. This resonates with observations of the 1992 riots in L.A. when mostly Korean shops in a predominately black neighborhood were targeted,

far from random or meaningless patterns of behavior. Reports suggest that shops with the sign 'black owned' were left alone, and when they were targeted, there is evidence to suggest rioters told others not to target certain premises. This interpretation illustrates that rioting is dialogical, occurring between people in a context of meaning and norms actively changing in a specific socio-cultural context. These types of analysis of interactions between groups during riots reveal the importance of the dialogical paradigm to understanding complex social phenomena. Gillespie and Cornish (2014) have begun to develop a methodology for analyzing interactions in utterances, texts, and observations of video and related forms of media (see Appendix). These "sensitizing questions" are the types of questions already being employed by researchers using the elaborated social identity model (ESIM) to understand riots. The innovation by Gillespie and Cornish is to simply state a series of six interrelated questions (and 10 sub-questions) to guide future research using the dialogical paradigm. Researchers need to address the context of the utterance or phenomena; ask what the speaker is doing and who are they addressing; who is doing the talking (power-relations); what future is being constituted; what are the responses from the other. We believe these "sensitizing questions" can be modified not only to understand the spread of rioting, but other contagious behaviors and ideas too. It offers a broad framework that extends beyond the limited scope of the biological model of contagious spread. It has the potential to offer new explanations and insights for seemingly non-patterned behavior.

Social contagion theory, the idea that certain behaviors are contagious, is not really a theory, nor one suited for riots. Consistent with the dialogical paradigm, the ESIM is now the dominant theory in explaining the inception, proliferation, limits, and patterns of rioting in various socio-cultural contexts (Drury & Reicher, 2009; Reicher, 1996, 1984; Reicher & Stott, 2011; Stott & Drury, 2012). According to the ESIM, protestors often define themselves as a heterogeneous group, but are often identified by police as a homogeneous group who are a potential threat to public order. The power relation between both groups is asymmetrical, with police being the dominant force. As a consequence of police repositioning the protestors from a heterogeneous to a homogeneous group, there is also a subsequent shift in the protestor's identity. Associated with this new identity are new forms of (now) legitimate action in the form of violence.

Contagious laughter

According to Provine (2000), first symptoms of the 1962 outbreak of contagious laughter in Tanganyika (now Tanzania) reportedly appeared 30 January, when three girls began laughing in a missionary school for girls ages 12–18, in Kashasha village. Reports held that laughing, crying, and agitation quickly spread to 95 out of the 159 students, and school was soon after forced to close. Individual laugh attacks lasted from minutes to a few hours, recurring up to four times a day. In a few cases, the symptoms persisted for 16 days. Within 10 days of

the school closing, laugh attacks were reported in the nearby village of Nshamba, where several of the Kashasha girls lived. There, 217 out of 10,000 Nshamba villagers, mostly young adults of both sexes and schoolchildren, were reportedly afflicted.

The Kashasha school students spread the laughter even further to neighboring villages and affected other schools. In Bukoba, the Ramashenye girl' middle school was forced to close in mid-June when 48 of the 154 girls were overcome with laughter. Yet, another outbreak appeared in Kanyangereka village, 20 miles from Bukoba, where one of the Ramashenye girls lived. That girl's family also showed symptoms. The outbreak quickly spread to boys, affecting two nearby boys' schools, both of which were forced to close. The epidemic afflicted roughly 1000 people in tribes bordering Lake Victoria in modern-day Tanzania and Uganda. Overall, 14 schools were forced to close, temporarily, and the epidemic in total lasted over two and a half years. Government authorities intervened to control it by quarantining certain villages, and the behavior was labeled as having "hysterical" origins after alternatives such as toxic reaction and encephalitis were excluded.

What these conclusions overlooked was the dialogical meaning of the laughter: the who and the why, to whom. According to Provine (2000), the greater the relatedness between the "victim" and observer of a laugh attack, the more likely it was that the witness was affected. Laughter spread along the lines of tribal, family, and peer affiliation. Females were most affected, and boys affected later. But being exposed to someone during a laugh attack was not enough to "catch" the behavior. If mere exposure led to spread, then laughter would have spread indiscriminately, indefinitely, and globally. The authors of this article might still be laughing right now. Yet it did not. We do not know why it stopped, and it is possible that we do not know because the wrong questions were asked, based on the wrong metaphor. Laughter might have been a normatively acceptable way of releasing stress in the midst of environmental burdens such as poverty or social control. Or perhaps it functioned in some other meaningful way for the people who chose to participate in it.

The dialogical paradigm

Fundamental to the dialogical paradigm is an interest in human motivation and communication (Linell, 2009), intentionality and perceived audiences (Bakhtin, 1981), socio-cultural and historical contexts (Marková, 2003), and trust, tensions, and (mis-) understandings (Marková & Gillespie, 2011). Contagious spread of behavior, thoughts, and emotions can only be understood, we argue, as an interaction between motivated agents and their context, rather than a linear transmission between unconscious cells. Individuals experience and engage with behaviors, cognitions, and ideas around them, appropriating them entirely, partly or not at all. Some contagion may be more automatic and unconscious than others, but even automatic behaviors (e.g. yawning or laughter) are regulated by social norms,

which appropriate what is and is not socially acceptable in any given context. Individuals actively engage with the substance of contagion, accepting, altering or (ending) its transmission through dialogical (or dialogical inhibiting) interactions.

This interpretation resonates with the work of Moscovici (2008/1976) on the diffusion of psychoanalysis in French society. His study revealed how different groups accepted, appropriated or refuted psychoanalytic ideas from their social position. Catholics, for example, anchored psychoanalytic ideas in terms of confession, allowing them to objectify new ideas in terms of pre-existing ones, thus familiarizing the new ideas and concurrently strengthening the position on confession.

This interpretation also helps us understand how “contagion” may reflect a strategy for communication between groups. Consider, for instance, the 1962 case of “psychogenic contagion” at a Midwestern electronics plant in the United States (Cohen, Colligan, Wester, & Smith, 1978). According to reports, 51 workers claimed that they smelled a strange odor and complained of dizziness, headaches, weakness, and nausea. A careful inspection of the plant yielded no evidence of any agents that would cause the reported symptoms. Cohen et al. (1978) investigated the incident by conducting a questionnaire on affected and unaffected workers to study their work conditions and exposure to stress. Cohen’s team found that affected workers reported poorer interpersonal relations, more work pressure, more job-role ambiguity, and less control in their job situations than non-affected workers. This psychological stress, Cohen’s team hypothesized, had no other outlets for expression. Over a period of time, a socially acceptable means of expression was produced by one group of workers: a mass physical symptomology.

Colligan and Murphy (1982) later reviewed Cohen’s study and 22 other incidents of so-called contagious psychogenic illness and agreed with the underlying mechanisms suggested by Cohen et al. (1978) about the nature of psychogenic illness. They even cited additional factors believed to play a role, such as gender, boredom, presence of physical stressors, level of perceived job stress, adequacy of interpersonal communications, and labor-management relations. Where voicing negative feelings in the workplace or elsewhere may not be seen as socially unacceptable, feeling sick from the same thing that makes others sick is a normatively acceptable outlet for those emotions, as well as a strategy for building group solidarity. Questioning the context, and people’s positions within it, and their relationship to one another, offers interesting ways to understand how psychogenic illness can spread between co-workers.

Future directions

The application of the dialogical paradigm to studies on social contagion opens several exciting areas for future research. For instance, the ESIM can inform our understanding of the spread of rioting as seen during the Arab Spring, the response

to the Danish “Muhammad” cartoons around the Muslim world, as well as Syria, Egypt, and elsewhere around the world, like in Ferguson, Missouri. The axiomatic starting point for conceptualizing these, and future riots, must reject a passive and linear conceptualization as espoused by a pathological model of contagious spread. Instead, analyses sensitive to broad historical, cultural, social, and economic contexts; the individuals and their actions in relation to others within these shifting and complex contexts, both in the past, present, and future, should be considered in trying to understand the spread of culturally situated spread of behaviors, ideas, representations, and values. The ESIM researchers illustrate how this can be done in relation to analysis of interview and video-based data with regard to protests and rioting. We argue that the theoretical and methodological tools of the dialogical paradigm can best help us understand contagious spread in complex socio-cultural worlds.

The application has implications for increasingly popular research on the “contagious” spread of emotions as well. Now widely used are instruments for measuring the social contagion of depression (e.g. Christakis & Fowler, 2007) and happiness (e.g. Totterdell, 2000). Predisposition to contagion has been measured using the susceptibility to emotional contagion scale (ECS) (Siebert, Siebert, & McLaughlin, 2007) and has been used to test the spread of burnout, depression, and professional impairment among social workers, for example. Also used is the ECS, 15-item unidimensional measure of susceptibility to others’ emotions (Doherty, 1997), adapted by researchers in Japan (Kimura, Yogo, & Daibo, 2008) and Sweden (Lundqvist, 2006). These instruments would be made more useful with a dialogical paradigm, paying attention to social meanings and group contexts.

Of the twitching contagion of Le Roy, New York, one neurologist concluded that the contagion was “a subconscious effect that occurs in patients. . .prone to anxiety or mood disorders” (Dube, 2012). Whereas a microbial and interpersonal model envisions such spread as between a “few bad apples,” or “prone” individuals, the dialogical paradigm adds explanatory power by asking questions about the school environment, the social environment, and the nature of interactions with peers and teachers, for instance. Asking such questions about meaning and social relationships is therefore a necessary step for taking group-level patterns seriously.

Epidemiological metaphors will likely remain popular in social science for their imaginative appeal. This is not to suggest that natural science is responsible for the error. Indeed, the same risks from the transfer of metaphors of natural science origin to social science can also apply to metaphors of social science origin applied to natural science. Perhaps the most famous illustrations of this are in the mereological fallacy, but also in more informal applications such as language of “fighting cancer,” applying terms of war and agency to inherently biological processes (Periyakoil, 2008). Our advice, therefore, is to correct and appropriate the natural science metaphors already used in social science with the dialogical paradigm, a set of diverse theories that assume an interest in motivations and meaning. Doing so

for claims of “contagion,” we have argued, adds explanatory power for diverse social phenomena, from the nature of spread in riots, to laughter epidemics, to dance crazes, to cases of mass psychogenic illness.

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Appendix: Table from Gillespie, A., and Cornish, F. (2014)

Clues indicating when to ask sensitizing questions.

Clues	Sensitizing Questions
Utterance seems out of place	What is the context?
Contradictions, disagreements, tensions, perspective management ('but', 'however,' 'yet' etc.), caveats	Are there overlapping contexts?
Out of context, strong initiation	What is the speaker doing?
Perspective management ('but', 'however,' 'yet' etc.), implications, resistance	What prompted the utterance?
Connections between present and future	What is the alternative that is being argued against?
Hesitation, rephrasing	What is the speaker trying to set up?
Audience resistance	Who is being addressed?
Utterance seems disconnected from immediate context	What is assumed about the audience?
Utterance 'sounds foreign in the mouth'	Does the utterance address any third parties?
Direct quotes, indirect quotes	Who is doing the talking?
Common turns of phrase, out of context, different style	Does the utterance contain a quotation?
Repetition of pattern	How does the speaker respond to the quotation?
Change in the situation or genre of interaction	Is the utterance voicing a cultural trope?
Morally loaded words, identity implications, resistance	What is the genre of interaction?
Topic cut short, topic change	What future is constituted?
Possible proof of interpretation, plurality of meanings	How does the utterance make history?
Explicit responses to self, hesitation, truncation, rephrasing, subsequent actions seem out of place	How does the utterance position people?
	What responses are enabled or constrained?
	What are the responses?
	What is the response of the interlocutor?
	What is the response of third parties?
	What is the response of the speaker?