

# Contributions towards a positive epidemiology of compassion: Exploring the transmission dynamics of acts of microkindness

Tim Lomas · Tyler J. VanderWeele

**Abstract:** Recent years have seen enthusiasm for a “positive epidemiology,” extending the standard focus on disease in epidemiology to encompass positive health-related qualities and states, including an epidemiology of compassion. We seek to contribute towards the latter by considering a prosocial state that is closely related to compassion, namely kindness. More specifically, we advocate for attention to a form of kindness which has received minimal attention, but which we consider potentially important, namely microkindnesses: small gestures motivated by genuine warm feelings for others that benefit another, where small refers both to (a) duration (i.e., lasting less than five seconds) and (b) personal consequence to the actor (i.e., involving minimal personal harm or expense). In particular, we focus on the possibility of microkindnesses being transmitted among people, drawing on literature around collective emotions and research on kindness more broadly. We conclude by proposing an epidemiological approach to studying transmission dynamics of microkindnesses, concentrating on smiling and the potential for using AI and emotion recognition software to explore these dynamics.

**Keywords:** kindness, microkindness, compassion, epidemiology, flourishing

## 1. Introduction

Founded perhaps over 350 years ago, epidemiology has traditionally focused on negative health-related states of illness and disease (Connor, 2024). Recent years however have seen calls, inspired by the emergence of positive psychology, for a *positive* epidemiology, extending the field’s attention to also encompass positive health-related qualities and states (Levin, 2007; VanderWeele et al., 2020). These include the focus of the present issue: compassion. We seek to contribute to this topic by considering a prosocial state that is closely related to compassion, namely kindness. More specifically, our interest is motivated by a form of kindness which has received minimal attention, but which we consider important—both in itself, and in relation to understanding compassion—namely *microkindness* (MK). This we define as a small gesture motivated by genuine warm feelings for others that benefits another, where small refers both to (a) duration (i.e., lasting less than five seconds) and (b) personal consequence to the actor (i.e., involving minimal personal harm or expense). We elucidate this definition throughout the paper but acknowledge upfront that prosocial behaviours can have complex motivations, including not only altruistic but also self-serving strategic considerations (Böckler et al., 2016). As such, it may be too much to require that an MK be *only* motivated by genuine warm feelings for others; however, we can at least stipulate this be *part* of the motivation, and ideally the dominant aspect.

We also note that the beneficiary need not be another person: in parallel with work around self-compassion (Neff, 2023) and self-kindness (Neely et al., 2009), we also envisage the value of self-oriented forms of MKs.

We recognize of course that kindness is distinct from compassion, and so may not be a *precise* fit within the remit of this special issue. Both can be defined in various ways, but a useful framing is provided by Gilbert et al. (2019) in a paper specifically focused on elucidating their semantic differences. They define compassion as “sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it” (p. 2260). Kindness is then differentiated—drawing on a definition formulated by Curry et al. (2018)—simply as “actions intended to benefit others” (p. 2261). We would not want to *overdo* their distinction though, especially since—as Gilbert et al. note—the terms are often used interchangeably, at least by some people, or at least are conceptually similar. As such, a paper on kindness is still relevant to compassion, and hence to this special issue. Moreover, even though the paper concentrates on kindness, it also offers a basis for future work on *micro-compassionate* acts, which we define—synthesizing Gilbert et al.’s definition of compassion with our formulation of MKs—as “sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it through small gestures, where small refers both to (a) duration (i.e., lasting less than five seconds) and (b) personal consequence to the actor (i.e., involving minimal personal harm or expense).”

This idea has received even less attention than MKs. A Google Scholar search for “micro-compassion” in November 2025 only retrieved nine results (compared to 34 for “micro-kindness”), and even those only mention it briefly. Li et al. (2018), for instance, note in passing a Micro-Compassion Program initiated by the Tencent company (Wang, 2015). It is beyond our scope to draw out potential parallels between possible epidemiologies of MKs and micro-compassion: it is sufficiently demanding to, (a) establish the concept of MKs, and (b) discuss an epidemiology of MKs, without also seeking to do (a) and (b) for micro-compassion. For example, we argue here that smiling constitutes an exemplar of an MK, and moreover suggest that the contagious “spread” of smiling in social settings lends itself to an epidemiological analysis. By contrast, we struggle to identify a comparably clear example of a micro-compassionate act that would provide the basis for an epidemiology of micro-compassion. Nevertheless, we hope this paper will provide the foundation for just such an enquiry, and prompt future work on micro-compassion, including epidemiological considerations. Similarly, one could also envisage an epidemiology of other prosocial qualities, such as niceness (Bialobrzeska, 2024; Okur et al., 2024), including potential “micro” forms (micro-niceness?).

With these points in mind, this paper outlines a case for a positive epidemiology of MKs over six sections. First, we introduce the notion of MKs, which arose as a conceptual counterpart out of prior work around microaggressions. We then consider the literature around various forms of collective emotions, which provides some theoretical context for the potential for MKs to be transmitted among people. Next we consider what it might mean to take an epidemiological approach to MKs, adapting ideas and methods of “standard” epidemiology—which generally focuses on disease—to positive phenomena, while the fourth section focuses specifically on smiling as an exemplar of an MK that could be studied epidemiologically. The penultimate section offers some suggestions for how to actually conduct epidemiological research *vis-à-vis* MKs. We conclude by considering some potential implications of ideas explored in the paper. Finally here, it is worth emphasizing that this is an exploratory conceptual paper that argues for the viability of what is essentially a new application of epidemiology, namely in relation to the relatively novel notion of MKs. As such, we have drawn on a diverse and indeed diffuse range of scholarship, spanning various fields, from epidemiology to psychology. Given its diffuse

nature, we have not been able to conduct a systematic literature review. Instead we have relied on our own selection and interpretation of literature with which we are familiar, of which we offer a selective and partial narrative review. There is undoubtedly relevant scholarship missing here that could also have been included, but we nevertheless hope that what is discussed is sufficient in showing the potential value and nature of an epidemiology of MKs.

## 2. Microkindnesses

In recent years the concept of “microaggressions” has risen to increasing prominence. The term was coined by Pierce (1970), who, as a black professor at a prestigious university, repeatedly found his authority challenged in subtle ways by some white students, such as being told how his class should be seated and structured. As Peirce notes, beyond the unsolicited advice itself, the issue is “how he approaches me, how he talks to me, how he seems to regard me. I was patronized” (p. 277). Given this origin, the notion has often been applied specifically to racial dynamics, and arguably the most influential definition and analysis of the concept is Sue et al.’s (2007) treatment of racial microaggressions. These are defined as “brief and commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward people of color” (p. 271). In the years since, the concept has become increasingly visible, especially since the killing of George Floyd in 2020, as the United States and indeed the world has become ever more cognizant of the continued blight of racism, including forms of harm represented by microaggressions (Toraif et al., 2023). Some people are skeptical of the danger posed by microaggressions, or at least of the idea that victims should aim to become *more* attuned and sensitive to them. Lukianoff and Haidt (2019), for example, suggest that such ideas run counter to principles developed in therapeutic disciplines and hence might be damaging overall to mental health. On the other hand, though, while it may be possible and even advisable to brush off a single microaggression, Pierce (1995) was particularly concerned by the cumulative burden of repeated exposure.

Much more could be said about microaggressions, but our focus here is the way the concept has been extended to other “micro” emotions and behaviours, including a conceptual counterpart of microaggressions, namely microkindnesses (MKs). Despite having received little attention—as noted above, a Google Scholar search returned only 34 results for the phrase—MKs are a promising idea. First to articulate the concept was Laughter (2014) in the context of multicultural education, defining MKs as “brief, verbal, or environmental acts of acts of respect, consciously intended to provide a potential space for positive and humanizing interaction” (p. 7). Explaining the value of the idea, Laughter argues that a “fundamental limitation” of research on microaggressions is that “we are only asking questions about negative consequences,” and that “while multicultural educators need to know what is going wrong, they should also have ideas and suggestions for positive actions they might take.” In that respect, Laughter suggests 20 MKs, 10 for the classroom (e.g., “smile and acknowledge” other students when walking past them), and 10 for the broader community (e.g., engaging in friendly conversation at a supermarket checkout).

Subsequent work on MKs has extended the idea into other areas of life. Laughter later looked at the role of MKs in the context of students’ engagement with social media, considering how educators can “identify and use social media as a tool for activism, identity formation, and inclusion” (Walker & Laughter, 2019). Bartleet (2016, 2019) embraced the concept in exploring how love can inform empathy and conciliation in intercultural community music contexts with Warumungu and Warlpiri musicians in Central Australia. Focusing on South Africa, Auerbach

(2020, 2022) argued that MKs are—as the title for the 2020 article put it—“laying the foundation for a transformed” nation, especially in the context of COVID-19, a process recorded in an “Archive of Kindness” ([http://archiveofkindness.mystrikingly.com/#\\_blog](http://archiveofkindness.mystrikingly.com/#_blog)). This process of reconfiguration is described as being centred around a renewed appreciation of *ubuntu*, a concept derived from a Zulu phrase that means “I am because you are,” which recognizes a condition of shared common humanity (Ewuoso & Hall, 2019). And Estrada et al. (2018) harnessed MKs in looking at the “influence of affirming kindness and community” on broadening participation in STEM career pathways (p. 258).

The notion of MKs also has parallels and precedents—even if “microkindness” isn’t specifically used—in other scholarship, such as stress research. While much of the academic attention focuses on major stresses, there has been some work on the negative impact of micro-stressors, referred to as “hassles,” especially when these pose an accumulative burden. In that context, hassles might be seen as akin to microaggressions. But researchers have also noted the counterpart value of small positive “uplifts,” which have the opposite effect, smoothing one’s passage through the day (Kanner et al., 1981). If a car journey filled with red lights and angry motorists presents a series of hassles that combine to produce an overall stressful experience, one marked by continual green lights and friendly faces is an uplifting one that brightens one’s day. Moreover, rather than hassles and uplifts merely being the “small stuff,” researchers have found they predict health outcomes and longevity (Jeong et al., 2016). Seen in that light, MKs perhaps constitute a subset of uplifts. While the literature on hassles and uplifts is substantial, MKs have received little attention, and their dynamics are understudied and undertheorized. To help remedy this lacuna, this paper looks at one aspect of MKs, namely transmission dynamics. We begin by considering the potential for emotions to be “shared” collectively.

### 3. Collective emotions

There is an extensive literature around the “sociology of emotions” (Thoits, 1989), which encompasses questions such as the “distribution of different emotional experiences in the population, the content of emotion culture, emotional socialization processes, emotional interactions, and relationships between social structure and emotion norms” (p. 317). Before exploring these ideas, we should note that kindness is not only an emotional state, but also has behavioural elements. It thus has aspects that are “inward” (i.e., subjective feelings of kindness) and “outward” (i.e., actions that manifest this kindness). Canter et al. (2017), for example, define it as a “gesture motivated by genuine warm feeling for others” (pp. 17-18). This dual-aspect is also recognized in dictionary definitions, such as Merriam-Webster, who define kindness as “the quality or state of being kind” ([www.merriam-webster.com/dictionary/kindness](http://www.merriam-webster.com/dictionary/kindness)), with “kind” itself defined as “a sympathetic or helpful nature” (<http://www.merriam-webster.com/dictionary/kind>). Some work tends to emphasize the outward aspect. Reviewing definitions of the concept in healthcare settings, for example, Hake and Post (2023) define kindness as “an action that benefits another, as perceived by the recipient of the kind action” (p. 1). They acknowledge that this is only kindness as “considered externally” though. The article makes clear that any action that did indeed benefit another but which lacked any inward emotional dimension on the part of the actor would not normally be considered kindness per se. One might conversely also argue that kind feelings without corresponding actions likewise do not constitute kindness proper; the key is the combination of kind emotions and behaviour. With that in mind, let us review relevant work around collective emotions, before applying this specifically to kindness.

There is a considerable literature on collective emotions, showing that group dynamics can lead to shared emotional experiences. A particularly helpful taxonomy has been provided by Israeli social-political psychologist Daniel Bar-Tal (2001). Reviewing the literature on the emotional impact of conflict situations in an article exploring how such circumstances tend to heighten negative emotions such as fear and reduce positive states like hope, Bar-Tal et al. (2007) identify five forms or aspects of shared emotions. Drawing on earlier work by de Rivera (1992), they differentiate emotional: (a) atmosphere (“emotions that arise when members of a group focus their attention on a specific short-term event that affects them as a group”); (b) culture (“the emotional relations that are socialized in any particular culture”); (c) climate (“the collective emotions experienced as a result of a society’s response to its sociopolitical conditions”); (d) orientation (“the characterizing tendency of a society to express a particular emotion”); and (e) field (“an emotional context that triggers particular emotions” as it “transmits salient cues and signals that evoke a particular emotion among society members”) (p. 443). They review literature showing how all these aspects of collective emotions are affected by conflict, noting that people “in different parts of the world live under humanly constructed contexts that foster negative climates that lead to such reactions as fear, anger, hatred, insecurity, and mistrust” (p. 455). In subsequent work, Bar-Tal and colleagues show that “in the context of intractable conflict, from a very early age onward, in-group members acquire a socio-psychological repertoire that consists of narratives, beliefs, attitudes, and emotions related to the conflict and to the rival group” (Nasie et al., 2021, p. 1257).

Bar-Tal et al.’s (2007) five forms/aspects of collective emotions can arguably be grouped into two broad categories: norms (i.e., culture and orientation) and experiences (i.e., atmosphere, climate, and field). Taking first norms, there is a wealth of work in this space, such as literature on cross-cultural differences in “ideal affect” — “the affective states that people strive for or ideally want to feel” (Tsai, 2007, p. 243) — and how these shape how people in those cultures seek, value, experience, and interpret particular emotions. Tsai and others have suggested, for instance, that Eastern cultures have developed a preference for positive states characterized by *low* arousal (e.g., peace, calmness), in contrast to Western cultures which place greater premium on high arousal states (Tsai et al., 2000; Tsai, Knutson, et al., 2006; Tsai, Levenson, et al., 2006; Tsai et al., 2007a; Tsai et al., 2007b; Tsai et al., 2007c; Tsai et al., 2016). Various explanations have been proposed for these trends, such as the long-observed idea that the West tends towards individualism and the East towards collectivism (Hofstede, 1980), even if these generalizations have been increasingly contested or at least complexified (Lomas et al., 2022). As Markus and Kitayama (1991) put it, a collectivist orientation involves “distinct conceptions of individuality that insist on the fundamental relatedness of individuals,” with an emphasis “on attending to others, fitting in, and harmonious interdependence with them” (p. 224). Using that lens, high arousal states are thought potentially liable to be interpreted in the East as self-aggrandizing and hence disruptive of social harmony, whereas low arousal states are more conducive to it, hence the preference for the latter in Eastern cultures (Leu et al., 2011; Uchida & Kitayama, 2009). Other Eastern cultural practices and traditions might also account for such preferences, like a rich history of developing contemplative and meditative practices (Joshnloo, 2014).

There is relatedly also considerable scholarship on collective emotional experiences. A prominent line of scholarship is on emotional contagion — sometimes known as the “ripple effect” (Barsade, 2002) — defined by Schoenewolf (1990, p. 50) as “a process in which a person or group influences the emotions or behavior of another person or group through the conscious or unconscious induction of emotion states and behavioral attitudes.” As Hatfield et al. (1993) put it, during interactions, people experience a stream of “moment-to-moment emotional reactions

to others” in which they often “nonconsciously and automatically mimic their companions’ fleeting expressions of emotion” (p. 96). Subsequent work has identified various mechanisms to the process, with contagion triggered by facial expressions, indirect human interactions, and/or by observing other people’s behaviour in direct and indirect interactions, as well as being triggered “physiologically or neurologically by synchronizing with the emotional state of others during human interactions” (Herrando & Constantinides, 2021, p. 1). These latter aspects find corroboration in neurophysiological literature around the “mirror neuron system,” which involves both mimicking (“the spectator’s simulation of the emotion/action of the principal”) and understanding (consequent experiential knowledge of the other’s emotion) (Khalil, 2011, p. 86). Mirror neurons are therefore seen as helping solve “the problem of other minds” (Iacoboni, 2009), allowing a form of “mind-reading,” whereby “other people’s mental states are represented by adopting their perspective: by tracking or matching their states with resonant states of one’s own” (Gallese & Goldman, 1998, p. 493). Such processes have been implicated in qualities like empathy (Corradini & Antonietti, 2013; Ferrari & Coudé, 2018; Gallese, 2001). These various aspects of shared emotions all have relevance to MKs, as we see next.

Although there is no empirical scholarship on shared MKs per se, there is an emergent literature in relation to kindness more broadly, as well as related concepts like compassion and empathy. One example is Buddhism, with His Holiness the Dalai Lama well known for saying “My religion is kindness” (e.g., cited in Cozort, 2006, p. 133), and with kindness a notable quality of predominantly Buddhist cultures, such as Thailand (Puntarigivat, 1998) and Tibet (Liu et al., 2020). I (the first author) studied emotional dynamics relating to kindness for my PhD, which explored the impact of meditation and Buddhism on men’s mental health, including through ethnographic analysis of a Buddhist centre in London (Lomas et al., 2014, 2016). The wider context of the study is that, in the “wider world,” men often experience pressure to conform to masculine norms that are *not* oriented around kindness, and which instead demand qualities such as toughness and stoicism (Courtenay, 2000). It was then significant that in the Buddhist centre the men encountered an alternative set of masculine norms which the men sought to cultivate and attributed to improved wellbeing. These included kindness, specifically a quality referred to in Pāli as *mettā*, usually translated as “loving-kindness” (Shonin et al., 2015). Not only was this valorised, there were meditation practices designed to actually engender it, namely the *mettā bhāvanā* (with *bhāvanā* meaning cultivation or development). Such is its efficacy that it has been harnessed in Western clinical settings, operationalized as loving kindness meditation, to treat various mental health issues (Hofmann et al., 2011). As a result, the centre arguably ticked all the boxes of Bar-Tal et al.’s taxonomy, involving a culture, orientation, atmosphere, climate, and field all suffused with qualities of kindness. With these ideas in mind, we turn to the possibility of an epidemiology of kindness.

#### 4. Towards an epidemiology of kindness

Recent years have seen enthusiasm regarding VanderWeele et al.’s (2020) call for a “positive epidemiology.” The seeds were planted by Levin (2007) who argued for “integrating positive psychology into epidemiologic theory” (p. 189). Building on this idea, VanderWeele et al. noted that although The Dictionary of Epidemiology (Last, 1983) defines epidemiology as “the study of the distribution and determinants of health-related states and events,” in practice, it mainly focuses on diseases and on risk factors for disease, rather than health and health assets. Yet as they put it, “neglecting positive health assets”—including “positive psychological states”—“gives an impoverished picture of the distribution and determinants of health and disease at the population level” (p. 189). VanderWeele et al. thus argue that epidemiology—with its “long

tradition of thinking deeply about study designs to assess etiology with observational data, and about methods and conceptual frameworks to address questions of causation” —can and should be brought to bear on positive phenomena like kindness. A positive epidemiology of MKs would thereby effectively study the distribution and determinants of such acts, along with their sources, mechanisms, and transmission.

There are already some excellent examples of such an approach, such as Fowler and Christakis’ (2008) longitudinal analysis of the “Dynamic spread of happiness in a large social network.” Their study centred around 5,125 people, referred to as “egos,” who were the offspring of 5,209 people originally recruited into the longitudinal Framingham Heart Study in 1948, with the offspring enrolled into the study in 1971. Each “ego” is connected to numerous other people (e.g., via friendship, family, spousal, neighbour, relationships), referred to as “alters.” This combination of egos and alters—comprising 12,067 people—constituted a social network of individuals connected at some point in 1971-2003. Fowler and Christakis then studied 4,739 egos who were alive in 1983, this being the first time measures of happiness were included in the study as part of the Center for Epidemiological Studies Depression Scale (CES-D), with these people assessed at multiple points up until 2003. Essentially, they found that “clusters of happy and unhappy people are visible in the network” (p. 1), with the relationship between people’s happiness extending up to three degrees of separation (e.g., the friends of one’s friends’ friends). Even more strikingly, their longitudinal statistical models indicated that “clusters of happiness result from the spread of happiness and not just a tendency for people to associate with similar individuals.” In terms of physical location, for example, having a friend who lives within a mile (about 1.6 km) and who becomes happy increases the probability that a person is happy by 25% (95% confidence interval 1% to 57%). As a result, they conclude that “happiness, like health, is a collective phenomenon.” Fowler and Christakis (2010), using experimental designs, also showed similar contagion effects for cooperative behaviour cascades extending to three degrees of separation. Similar network effects have been found in other work with respect to cooperative behaviours (Jordan et al., 2013) and prosociality (Chancellor et al., 2018). Scholarship such as Valente’s (1996; Valente & Vega Yon, 2020) work on social network thresholds in the diffusion of innovations is also instructive.

We can apply such thinking to MKs. There are already precedents in Levin’s (2000, 2007, 2023) pioneering work in proposing an epidemiology of love. From one perspective, some MKs could be considered acts of love, such as the myriad MKs liable to be shared between those who love each other, like parents and children, or romantic partners. VanderWeele and Lee (2025) discuss more recent longitudinal epidemiologic and experimental evidence for effect of love on the wellbeing of the beloved and of the lover. Some theorists might even regard MKs *per se* as forms of love. Fredrickson’s (2013) notion of “Love 2.0,” for instance, defines love as “a micro moment of positivity resonance, during which three core elements—(1) shared positive emotion, (2) mutual care, and (3) biobehavioral synchrony—emerge with temporal coherence between and among people” (p. 852). A genuine shared smile between people certainly fits this notion of love. However, MKs arguably deserve attention in their own right insofar as love is usually considered a longer-term disposition (VanderWeele, 2023), and MKs can arguably arise independent of contexts in which usual forms of love are operative.

Building on such ideas, we have formulated a usable definition of MKs—introduced above—that might be useful from an epidemiological perspective and begin the difficult task of exposure assessment. We define MKs by combining the definitions of kindness from Canter et al. (2017) and Hake and Post (2023)—since the former emphasises the emotional inward aspect of the act but not its consequences, while the reverse is true for the latter, and both aspects seem important

and necessary—together with the qualifier “small,” namely: a small gesture motivated by genuine warm feelings for others that benefits another, where small refers both to (a) duration (i.e., lasting less than five seconds) and (b) personal consequence to the actor (i.e., involving minimal personal harm or expense). With the duration, while five seconds is somewhat arbitrary, it helps differentiate MKs from kindness more broadly. With the consequences, this reflects the fact that even very quick actions can be personally costly. A person may push a child out of the way of a moving car at the cost of his or her own personal injury, and while the action may be short in duration it is hardly small in consequences, and could not be considered a *micro* kindness. Thought was also given to applying “small” to the effect of the MK, but that did not seem appropriate. A person may smile at another, for instance, at minimal cost, but with the potential for the consequence to be great. In an educational setting, for instance, Assali (2024) found through qualitative interviews that a “smiling teacher” led to “positive changes in attitude; learning climate; motivation and involvement; rapport with the subject; reduction in stress; anxiety; fear and anger; and an improvement in trust and respect” among the students (p. 1517). Indeed, studies have shown that the positive impact of MKs—and kindness more broadly—is often underestimated (Boothby & Bohns, 2021; Kumar & Epley, 2023; Zhao & Epley, 2021). To that point, a genuine and kind smile is arguably the exemplar of an MK, as we consider next.

## 5. Towards an epidemiology of smiling

In suggesting that a genuine and kind smile exemplifies an MK, the qualifiers in the sentence are of course vital. There is a considerable literature on the difference between false and genuine smiles—with the latter known as “Duchenne” smiles after their pioneering analysis by Duchenne (1862/1990)—which can be detected by children as young as two (Song et al., 2016). Per the Facial Action Coding System developed by Ekman et al. (1978), two key muscle areas are involved in a genuine smile: Action Unit 6 (AU6), orbicularis oculi, which activates the cheek raiser and causes crinkling around the eyes; and Action Unit 12 (AU12), zygomatic major, which pulls up the corners of the mouth. Crucially, AU6 cannot be intentionally manipulated by most people, hence the Duchenne smile usually being a reliable marker of a person’s psychological state and intentions. There is also the important qualifier “kind,” since a minority of people can take pleasure in the suffering of others, so even if their smile is genuine it may reflect a form of malicious delight (Hart et al., 2022). Mostly though, genuine smiles are valuable markers not only of a positive mental state (e.g., happiness), but moreover often a prosocial orientation. While a person may smile even when alone (e.g., recalling a positive memory), more frequently they are communicative acts, constituting what Song et al. call an “evolutionary important signal of honest affiliative and cooperative intent” (p. 490). Possibly a homologue to the silent-bare-teeth display seen across primates that signals submission or appeasement, genuine smiles usually signal positive intent and, ultimately, kindness (Kret et al., 2020). Moreover, a genuine smile does not only *signal* kindness, but itself is often an *act* of kindness, per the definitions above, with the recipient often feeling reciprocal positive emotion as a result (Otterbring, 2017).

For this reason, scholars have identified the transmission of smiling as an exemplar of what Bradley et al. (2023, p. 110) call the “potential for kindness contagion.” This could be framed in traditional epidemiological terms, acknowledging that it is beyond our scope here to consider all possible dynamics. But we can at least draw on some basic principles at the core of the field. In considering the possibility for the “contagion” of MKs, we will briefly discuss analogous infectious disease epidemiology—as opposed to a more psychosocial epidemiologic framework—so we focus particularly on ideas in that area. A key principle we might draw upon is the epidemiologic “triad,” which—to use the standard emphasis on disease/illness—includes:

an agent (a micro-organism, such as a bacterium or virus, that is capable of causing disease); a host (a human who is susceptible to disease transmission); and the environment (factors that facilitate transmission, from physical conditions such as air and water to behavioural factors such as diet and exercise). To these is often added the concept of vector, namely “an agent that can promote the interaction of the agent, host, and environment to cause the establishment of a disease,” such as mosquitos in the case of malaria (Porche, 2023). Additionally, thinking from an infectious disease perspective means considerations such as different forms of transmission, including common-source (persons all exposed to an infectious agent or a toxin from the same source), point-source (persons exposed to the same source of infection over a short period, leading to a rapid increase in cases followed by quick decline once the source is removed or the individuals are no longer exposed), and person-to-person propagation (spread of infectious diseases through direct or indirect contact between individuals). One must also think of issues such as exposure assessment (quantifying how an individual or population comes in contact with a contaminant).

We can endeavour to apply this terminology to MKs, drawing on the example of a Buddhist centre to illustrate the ideas (though other sources of MKs could serve equally well, such as any other religious setting). First, the concepts of host and environment can easily be transposed to the situation of MKs, as they are essentially the same (i.e., the host is still a human, and the environment again covers all aspects of the context in which they find themselves). A vector might be slightly more difficult to re-conceptualize in this instance, but could include many of the ideas mentioned above in relation to Buddhism, for example, such as practices like the *mettā bhāvanā*, and indeed Buddhism itself. Most difficult of all though is the “agent.” If a smile is emotionally “contagious,” it is not clear what exactly is being “transmitted” that might be analogous to a micro-organism in the case of disease: a state of mind, a prosocial signal, a behavioural gesture, something else, or all these combined? At this stage in our understanding, we might simply describe the smile itself as the agent. In terms of transmission mechanics, all those mentioned above could be relevant, including common-source (e.g., the Buddhist centre), point-source (e.g., the Buddhist centre at particular times, such as a meditation session led by a particularly kind, smiley teacher), and person-to-person propagation (e.g., practitioners smiling at people as they leave the centre following the session). In terms of exposure assessment, this could range from counting the number of smiles given by a teacher during a given session, to calculating the amount of time attendees spent inside the centre. With these possibilities in mind, we now consider some possible ideas for studying the epidemiology of smiling (as emblematic of the epidemiology of MKs more broadly).

## 6. Epidemiological approaches to studying MKs

An epidemiological approach to the transmission of smiling—as an exemplar of the “contagion” of MKs—would seek to study and understand how smiling spreads throughout a population of hosts (i.e., humans), both geographically and temporally. As a way into this way of thinking, let us consider, (a) the early epidemiologic work of John Snow tracing an outbreak of cholera in London to a contaminated water source in 1854, and (b) the example of a Buddhist centre in a major city (though, to reiterate, any setting characterized by a high level of MKs, such as other religious centres, would serve equally well as an example). Snow’s efforts were pioneering in their own way, and despite being somewhat mythologised (McLeod, 2000), offer a concrete example for us to draw on. The basic story is that, challenging the prevailing view that cholera was caused by a vaguely defined fetid “miasma,” the young anaesthesiologist mapped cases in his local area of Soho and found these clustered around one particular water pump. Using this

reference point, could the Buddhist centre similarly serve, in a positive sense, as the source for an “outbreak” of MKs, as indexed by smiling? The WHO (2024) defines a “disease outbreak” as “the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season.” In that regard, might one study whether the Buddhist centre could be the cause of such an outbreak.

There are various potential methods for studying this. Perhaps the simplest is collecting self-report data from attendees. This is the method Fowler and Christakis (2008) used to assess whether participants in their study were happy (using the prosocial acts or happiness items in the CES-D). In the present case, we are interested in smiling specifically, for which there are also relevant metrics that can be adapted. The Gallup World Poll, for example, includes items that ask whether people had various experiences “during a lot of the day yesterday,” one of which is “smiling or laughing.” This serves as a useful template, albeit one we could make more specific to study the phenomenon in more detail. One might ask people, for instance, “How many times did you smile at other people in the past \_\_\_”. The time period in question could then vary, depending on how often researchers are able to ask this of participants. A question such as this, if it had been inserted into the Framingham Heart Study, might then have allowed the methodology employed by Christakis and Fowler (2010) to begin to also study the contagion of smiles or other MKs. In other contexts, researchers could aim to ask this every hour (e.g., if people agreed to be contacted via text message), thus providing quite granular data. This could then be merged with other relevant data, such as the times the person attended the Buddhist centre for sessions over the week, either ascertained again by self-report data, or perhaps through other means, such as geospatial tracking data on their phone. This would give a rough sense of whether the centre could serve as a common source, and specific meditation sessions as a point source, of an outbreak of MKs.

There is also the potential for leveraging less well-established methods. One possibility would be to harness technology, including, firstly, the near ubiquity of Closed-Circuit Television Cameras (CCTV) in cities like London, with one estimation by Clarion Security Systems (2022) suggesting there were over 950,000 in that particular metropolis (and the numbers have surely risen far higher in the years since), constituting approximately one for every 10 people, who are likely to be captured by camera up to 70 times per day. The footage itself could be analysed by the increasingly sophisticated forms of AI facial emotion recognition software available (see Cîrneanu et al., 2023, Khare et al., 2024, and Leong et al., 2023 for systematic reviews). The existence and implications of both technologies—CCTV and facial recognition software—may reasonably be highly troubling, especially given their potential for misuse by authoritarian-minded governments (Kostka et al., 2023). One might likewise hold that these technologies should be dramatically scaled back (rather than totally abolished, given *some* valid and necessary uses). Indeed, despite raising this suggestion as a thought experiment, and perhaps even a real experiment, we ourselves find the idea rather unappealing. Given that these technologies are *already* being used at scale though, we can at least try to imagine some positive uses for them, such as gaining better understanding of the epidemiology of MKs. When assessing levels of smiling, this might thus be done by training the emotion-recognition software upon the CCTV footage obtained around the area and analysing the patterns.

To establish whether there is any effect at all, one would first need to compare the area around the Buddhist centre (say, a radius of one mile) with a nearby area as similar as possible in all other respects (e.g., socioeconomic variables). This would allow one to see whether levels of smiling around the centre are “in excess of what would normally be expected” in that part of the city. To then have greater confidence in attributing this to the centre itself, one could then

compare the proportion smiling in a one-mile radius around the centre after it has held a *mettā bhāvanā* practice session versus the same time period on a day the centre is closed, as a sort of self-controlled study. One could likewise assess the comparisons of time periods in relation to the comparisons of the same time periods in other similar areas to also address day-of-week or other temporal confounding effects. If levels of smiling were indeed higher on days it was open, this would increase the confidence that the centre was indeed the source. In that case, further analyses would be helpful in exploring potential transmission dynamics. One parameter is the radius of the area of proximity in question. One could compare, for example, a radius of 200 meters, half a mile, and a mile, thereby assessing how far the outbreak spreads geographically, and whether attenuation effects are observed (i.e., how does the transmission weaken the further one gets from the centre). Second, and relatedly, what kind of temporal dynamics are observed in terms of the dissipation of any effects? If the centre holds a *mettā bhāvanā* practice session, what is the level of smiling nearby immediately after, compared to one hour later, several hours later, etc.? After that, myriad other factors could be examined to explore the environmental factors that influence transmission, such as weather (e.g., is transmission more likely on sunnier days?), time of day (e.g., is there an optimal time for transmission?), and so on.

There is also the potential to harness these technologies in a more self-contained setting, either as a naturalistic observation or in an experimentally manipulated paradigm. A good example might be a train station, which is opportune for many reasons. First, it is an environment which is relatively well-covered with CCTV cameras that can provide the visual data for AI analysis. Second, it is mostly populated by people who are strangers to each other, interacting in one-off kinds of ways, relatively uninfluenced by any personal relationship history and the dynamics of prior interactions or relationships. Third, such locales often feature key figures, or “influencers,” who might interact with a preponderance of the travellers, such as a ticket seller or inspector. Let us focus on such an influencer, say an inspector checking people’s tickets at some entry point (e.g., to the platform). If it were a naturalistic design, then whatever emotion and behaviour this person happened to express would be the “agent,” including (but not limited to) smiling. If this were an experimental design, one could actually use a “stooge” (i.e., someone in on the study) as the influencer, and instruct them how to act, thereby exploring varying levels of MKs (e.g., ranging from refraining from smiling, to smiling politely, to effusively smiling). One could then use the emotion recognition software to see the transmission dynamics. If the influencer is smiling, for example, one could explore: (a) what percentage of commuters in turn begin to smile, (b) how long does their smile last for, (c) how many people are in turn “infected” by their smile (i.e., begin to smile themselves), and so on. By asking such questions, we may gain a better understanding of the epidemiology of these valued positive dynamics.

Finally, these techniques and analyses would ideally also be calibrated in light of demographic and cultural considerations pertaining to smiling and prosociality more broadly. In terms of demographic considerations, for instance, there is a considerable literature around sex differences in relation to smiling, with females more likely to smile—e.g., as shown in a meta-analysis of 162 research reports (LaFrance et al., 2003)—whether for genetic reasons (Ellis, 2006), gender-related socialization (Halberstadt et al., 1988), or some combination of both. As such, any AI-led analyses of smiling would ideally have some consideration of sex differences factored into its algorithm, such as varying baseline expectations of how frequently males and females smile. There is also a rich literature on cultural differences around smiling, including in relation to norms, interpretation, and frequency (Arapova, 2017). An analysis of “cultural display rules” from 32 countries, for example, found that historical heterogeneity—“the extent to which a country’s present-day population descends from numerous (vs. few) source countries”—is

linked to norms favouring greater emotional expressivity (Rychlowska et al., 2015, p. 1). While our present understanding of cultural variation in smiling is less advanced or robust compared to that around sex differences, this is nevertheless something that could also be factored into any future AI analysis, such as once again having different baseline expectations of how frequently people in various cultures smile.

Relatedly, it will be important to consider and factor in the possibility that people may show preferences for exhibiting MKs toward some individuals rather than others. This includes, for example, biases based on perceptions of (dis)similarity in terms of sex, race, socioeconomic status, etc. (Beaupré & Hess, 2003), as reflected in the notion of “homophily” —i.e., birds of a feather flock together (McPherson et al., 2001). Indeed, the analyses suggested here would enable better understanding of these very processes, since it would be instructive to compare the transmission dynamics of MKs in relation to such socio-demographic factors. Lastly, one would also ideally seek to factor in *reactions* to a smile. For example, even though MKs are positioned here as the conceptual opposite to a microaggression, under certain circumstances an intended MK could *itself* be perceived as a microaggression. An AI algorithm would thus ideally track responses in a sensitive and granular way. If someone reacted to a smile with a frown for example, while that wouldn’t allow one to conclude the smile was perceived as a microaggression per se, it would at least show it was interpreted negatively in some way, so perhaps needed to be discounted as an MK (or at least flagged as contentious and complicated). Other such nuances can no doubt be identified, but these initial suggestions at least offer a rudimentary roadmap towards harnessing technology and AI in the service of an epidemiology of MKs.

## 7. Conclusion

Heeding recent calls for a “positive epidemiology,” this paper has applied this approach to kindness, and specifically to the little-studied phenomenon of MKs—a small gesture motivated by genuine warm feelings for others that benefits another, where small refers both to (a) duration (i.e., lasting less than five seconds) and (b) personal consequence to the actor (i.e., involving minimal personal harm or expense). The paper began by introducing the notion of MKs, which arose as a conceptual counterpart out of prior work around microaggressions. It then considered literature around collective emotions, which provides a theoretical context for the potential for MKs to be transmitted among people. Next, while there is little scholarship on MKs per se, a wealth of research exists on kindness more broadly, including its transmission dynamics, which we considered in our third section, drawing on the example of Buddhist practices and cultures. The fourth section explored what it might mean to take an epidemiological approach to MKs, adapting ideas from epidemiology to this kind of positive phenomena. Lastly, we offered suggestions for possible conduct of epidemiological research in relation to MKs, concentrating in particular on smiling and using emotion recognition software to explore these dynamics, while acknowledging that much would remain to be worked out in such a project.

Finally then, let us conclude by noting some implications of these ideas, especially in trying to create a kinder society. With ever-increasing concern about polarization in many countries, and indeed the world entire, there is desperate need for new strategies to heal hatred and division, to build bridges and bring people together. In that context, focusing on MKs, and kindness more generally, can seem both very simple yet profound and revolutionary. To adapt John Lennon, “give kindness a chance.” The question, of course, is how. The first step is one to which this paper aims to contribute, namely, establishing a base of scholarship that shows the importance of kindness. Building on that foundation there could ideally be campaigns or events that could generate or serve as epicentres of MKs. While there are not currently any instances

regarding MKs per se, there are certainly examples relating to kindness more broadly. There are campaigns, from World Kindness Day 2024 ([www.randomactsofkindness.org/world-kindness-day](http://www.randomactsofkindness.org/world-kindness-day)), as discussed in a paper with the subtitle “Let’s make kindness contagious” (Kodack et al., 2024), to The Kindness Campaign ([www.tkckindness.org](http://www.tkckindness.org)), which provides social-emotional learning skills curriculum and programming to over 50,000 children and families annually. There are relatedly many events, such as a “kindfulness” symposium at the Tzu Shan Monastery in Hong Kong in 2024, at which ideas from this present paper were first shared (Lomas & VanderWeele, 2024).

The news media also plays an important role, especially given that its content has become increasingly negative and polarizing over time. Such trends have contributed, as VanderWeele and Brooks (2023) put it, to “discord, negative interactions, and consequently also poorer societal well-being and worse health” (p. 447). Media would thus ideally be more frequently oriented towards promoting MKs. To that end, VanderWeele and Brooks propose that media outlets commit to reporting at least one positive event for every three negative news stories, which they argue could have a significant positive impact on public health, and that viewers commit to avoiding news outlets that fail this standard. Attention to stories centred around kindness would be most welcome. Similar considerations apply to social media, especially in terms of the algorithms the dominant players use to drive engagement, which have hitherto tended—as with the news media—to focus on and amplify negative content, since this seemingly increases people’s use of the platform (Gramigna, 2022). Thankfully though there are counter efforts to make technology more “humane” and conducive to flourishing. Such calls have been around for decades (Aspy, 1975), but have accelerated lately though efforts of people like Tristan Harris, co-founder of the Center for Humane Technology (Harari et al., 2023). In that light, it does not seem too outlandish to seek to persuade companies to tweak their algorithms to boost attention to kindness. After all, even if doing so impacts their bottom line, surely this is worth it if we can move towards a better and kinder society (since even tech moguls have to live here too). There are indeed nascent efforts along these lines, such as work by Alrimawi and Nuseibeh (2024) to explore “systematic ways in which kindness concerns can be considered by software engineers” (p. 280). Somewhat similarly there are attempts to show how social media influencers have the potential to create a “virtuous cycle” and spark a “kindness contagion.” Hopefully then this article can further encourage such efforts as we try to move to a kinder society. And more specifically, we hope the paper provides a foundation and impetus for future research on the little-understood but valuable topic of MKs. More generally, it will ideally also help make the case for a positive epidemiology as we seek to develop a better and deeper appreciation of the dynamics of flourishing.

### **Authors**

Tim Lomas

Harvard T.H. Chan School of Public Health, Department of Epidemiology & Human Flourishing Program,  
Harvard University, Cambridge, MA, USA

<https://orcid.org/0000-0001-9458-6185>

[tlomas@hsph.harvard.edu](mailto:tlomas@hsph.harvard.edu)

Tyler J. VanderWeele

Harvard T.H. Chan School of Public Health, Department of Epidemiology & Human Flourishing Program, Harvard University, Cambridge, MA, USA; Department of Epidemiology, Boston University, Boston, MA, USA

<https://orcid.org/0000-0002-6112-0239>

### Author contribution statement

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### References

- Alrimawi, F., & Nuseibeh, B. (2024). Meta-modelling kindness. *Proceedings of the ACM/IEEE 27th International Conference on Model Driven Engineering Languages and Systems*, 280–289. <https://doi.org/10.1145/3640310.3674095>
- Arapova, M. A. (2017). Cultural differences in Russian and Western smiling. *Russian Journal of Communication*, 9(1), 34–52. <https://doi.org/10.1080/19409419.2016.1262208>
- Aspy, D. N. (1975). The humane implications of a humane technology. *Peabody Journal of Education*, 53(1), 3–8. <https://doi.org/10.1080/01619567509538039>
- Assali, M. A. (2024). The power of a smile: Exploring the connection between teacher facial expressions and ESL learning. *Journal of Ecohumanism*, 3(7), 1517–1524. <https://doi.org/10.62754/joe.v3i7.4316>
- Auerbach, J. (2020). Micro kindnesses are laying the foundation for a transformed South Africa. *Daily Maverick*. <https://www.dailymaverick.co.za/article/2020-04-15-micro-kindnesses-are-laying-the-foundations-for-a-transformed-south-africa/>
- Auerbach, J. (2022). The pedagogy of hyperlinkages: Knowledge curatorialism and the archive of kindness. *African Journal of Higher Education*, 36(1), 76–95. [https://hdl.handle.net/10520/ejc-high\\_v36\\_n1\\_a5](https://hdl.handle.net/10520/ejc-high_v36_n1_a5)
- Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly*, 47(4), 644–675. <https://doi.org/10.2307/3094912>

- Bar-Tal, D. (2001). Why does fear override hope in societies engulfed by intractable conflict, as it does in the Israeli society? *Political Psychology*, 22(3), 601–627. <https://doi.org/10.1111/0162-895X.00255>
- Bar-Tal, D., Halperin, E., & De Rivera, J. (2007). Collective emotions in conflict situations: Societal implications. *Journal of Social Issues*, 63(2), 441–460. <https://doi.org/10.1111/j.1540-4560.2007.00518.x>
- Bartleet, B.-L. (2016). The role of love in intercultural arts theory and practice. In P. Burnard, E. Mackinlay, & K. Powell (Eds.), *The Routledge International Handbook of Intercultural Arts Research* (pp. 91–101). Routledge. <https://doi.org/10.4324/9781315693699>
- Bartleet, B.-L. (2019). How concepts of love can inform empathy and conciliation in intercultural community music contexts. *International Journal of Community Music*, 12(3), 317–330. [https://doi.org/10.1386/ijcm\\_00003\\_1](https://doi.org/10.1386/ijcm_00003_1)
- Beaupré, M. G., & Hess, U. (2003). In my mind, we all smile: A case of in-group favoritism. *Journal of Experimental Social Psychology*, 39(4), 371–377. [https://doi.org/10.1016/S0022-1031\(03\)00012-X](https://doi.org/10.1016/S0022-1031(03)00012-X)
- Bialobrzeska, O. (2024). Niceness scale: Development and validation of self-reported behavioral niceness measure. *Personality and Individual Differences*, 218, 112480. <https://doi.org/10.1016/j.paid.2023.112480>
- Böckler, A., Tusche, A., & Singer, T. (2016). The structure of human prosociality. *Social Psychological and Personality Science*, 7(6), 530–541. <https://doi.org/10.1177/1948550616639650>
- Boothby, E. J., & Bohns, V. K. (2021). Why a simple act of kindness is not as simple as it seems: Underestimating the positive impact of our compliments on others. *Personality and Social Psychology Bulletin*, 47(5), 826–840. <https://doi.org/10.1177/0146167220949003>
- Bradley, T., Anderson, K. C., & Hass, A. (2023). The virtuous cycle: Social media influencers' potential for kindness contagion. *Journal of Macromarketing*, 43(2), 110–118. <https://doi.org/10.1177/02761467231163754>
- Canter, D., Youngs, D., & Yaneva, M. (2017). Towards a measure of kindness: An exploration of a neglected interpersonal trait. *Personality and Individual Differences*, 106, 15–20. <https://doi.org/10.1016/j.paid.2016.10.019>
- Chancellor, J., Margolis, S., & Lyubomirsky, S. (2018). The propagation of everyday prosociality in the workplace. *The Journal of Positive Psychology*, 13(3), 271–283. <https://doi.org/10.1080/17439760.2016.1257055>
- Cîrleanu, A.-L., Popescu, D., & Iordache, D. (2023). New trends in emotion recognition using image analysis by neural networks, a systematic review. *Sensors*, 23(16), 7092. <https://doi.org/10.3390/s23167092>
- Clarion Security Systems. (2022). How many CCTV cameras are in London? *Clarion Security Systems*. <https://clarionuk.com/resources/how-many-cctv-cameras-are-in-london>
- Connor, H. (2024). John Graunt F.R.S. (1620-74): The founding father of human demography, epidemiology and vital statistics. *Journal of Medical Biography*, 32(1), 57–69. <https://doi.org/10.1177/09677720221079826>
- Corradini, A., & Antonietti, A. (2013). Mirror neurons and their function in cognitively understood empathy. *Consciousness and Cognition*, 22(3), 1152–1161. <https://doi.org/10.1016/j.concog.2013.03.003>
- Courtenay, W. H. (2000). Constructions of masculinity and their influence on men's well-being: a theory of gender and health. *Social Science & Medicine*, 50(10), 1385–1401. [https://doi.org/10.1016/S0277-9536\(99\)00390-1](https://doi.org/10.1016/S0277-9536(99)00390-1)
- Cozort, D. (2006). Tibetan Buddhism in the United States. In E. V. Gallagher & W. M. Ashcraft (Eds.), *Introduction to New and Alternative Religions in America* (pp. 131–157). Greenwood Press.
- Curry, O. S., Rowland, L. A., Van Lissa, C. J., Zlotowitz, S., McAlaney, J., & Whitehouse, H. (2018). Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. *Journal of Experimental Social Psychology*, 76, 320–329. <https://doi.org/10.1016/j.jesp.2018.02.014>
- de Rivera, J. (1992). The concept of emotional climate. *International Journal of Psychology*, 27(3–4), 185.
- Duchenne, B. (1862). *The mechanism of human facial expression or an electro-physiological analysis of the expression of the emotions* (A. Cuthbertson, Trans.). Cambridge University Press.

- Ekman, P., Friesen, W. V., & Hager, J. C. (1978). *Facial Action Coding System: A Technique for the Measurement of Facial Movement*. Consulting Psychologists Press.
- Ellis, L. (2006). Gender differences in smiling: An evolutionary neuroandrogenic theory. *Physiology & Behavior*, 88(4–5), 303–308. <https://doi.org/10.1016/j.physbeh.2006.03.034>
- Estrada, M., Eroy-Reveles, A., & Matsui, J. (2018). The influence of affirming kindness and community on broadening participation in STEM career pathways. *Social Issues and Policy Review*, 12(1), 258–297. <https://doi.org/10.1111/sipr.12046>
- Ewuoso, C., & Hall, S. (2019). Core aspects of ubuntu: A systematic review. *South African Journal of Bioethics and Law*, 12(2), 93. <https://doi.org/10.7196/SAJBL.2019.v12i2.679>
- Ferrari, P. F., & Coudé, G. (2018). Mirror neurons, embodied emotions, and empathy. In *Neuronal Correlates of Empathy* (pp. 67–77). Academic Press. <https://doi.org/10.1016/B978-0-12-805397-3.00006-1>
- Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: longitudinal analysis over 20 years in the Framingham Heart Study. *BMJ*, 337(dec04 2), a2338–a2338. <https://doi.org/10.1136/bmj.a2338>
- Fowler, J. H., & Christakis, N. A. (2010). Cooperative behavior cascades in human social networks. *Proceedings of the National Academy of Sciences*, 107(12), 5334–5338. <https://doi.org/10.1073/pnas.0913149107>
- Fredrickson, B. L. (2013). *Love 2.0: How our supreme emotion affects everything we feel, think, do, and become*. Hudson Street Press.
- Gallese, V. (2001). The “shared manifold” hypothesis. From mirror neurons to empathy. *Journal of Consciousness Studies*, 8(5–6), 33–50. <https://www.ingentaconnect.com/content/imp/jcs/2001/00000008/f0030005/1208>
- Gallese, V., & Goldman, A. (1998). Mirror neurons and the simulation theory of mind-reading. *Trends in Cognitive Sciences*, 2(12), 493–501. [https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(98\)01262-5](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(98)01262-5)
- Gilbert, P., Basran, J., MacArthur, M., & Kirby, J. N. (2019). Differences in the semantics of prosocial Words: An exploration of compassion and kindness. *Mindfulness*, 10(11), 2259–2271. <https://doi.org/10.1007/s12671-019-01191-x>
- Gramigna, R. (2022). Inside Facebook’s semiosphere. How social media influence digital hate and fuel cyber-polarization. *Social Semiotics*, 32(5), 606–633. <https://doi.org/10.1080/10350330.2022.2157171>
- Hake, A. B., & Post, S. G. (2023). Kindness: Definitions and a pilot study for the development of a kindness scale in healthcare. *PLOS ONE*, 18(7), e0288766. <https://doi.org/10.1371/journal.pone.0288766>
- Halberstadt, A. G., Hayes, C. W., & Pike, K. M. (1988). Gender and gender role differences in smiling and communication consistency. *Sex Roles*, 19(9–10), 589–604. <https://doi.org/10.1007/BF00289738>
- Harari, Y., Harris, T., & Raskin, A. (2023, March 27). You can have the blue pill or the red pill, and we’re out of blue pills. *International New York Times*.
- Hart, W., Kinrade, C., & Lambert, J. T. (2022). Sadistic pleasure and diminished suffering perceptions: Further evidence that sadism entails rationalization. *Personality and Individual Differences*, 195, 111680. <https://doi.org/10.1016/j.paid.2022.111680>
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. *Current Directions in Psychological Science*, 2(3), 96–100. <https://doi.org/10.1111/1467-8721.ep10770953>
- Herrando, C., & Constantinides, E. (2021). Emotional contagion: A brief overview and future directions. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.712606>
- His Holiness the Dalai Lama. (2018). *The Dalai Lama’s Little Book of Inner Peace: The Essential Life and Teachings*. Hampton Roads Publishing.
- Hofmann, S. G., Grossman, P., & Hinton, D. E. (2011). Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical Psychology Review*, 31(7), 1126–1132. <https://doi.org/10.1016/j.cpr.2011.07.003>

- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values*. Sage Publications.
- Jacoboni, M. (2009). Imitation, empathy, and mirror neurons. *Annual Review of Psychology*, *60*(1), 653–670. <https://doi.org/10.1146/annurev.psych.60.110707.163604>
- Jeong, Y.-J., Aldwin, C. M., Igarashi, H., & Spiro, A. (2016). Do hassles and uplifts trajectories predict mortality? Longitudinal findings from the VA Normative Aging Study. *Journal of Behavioral Medicine*, *39*(3), 408–419. <https://doi.org/10.1007/s10865-015-9703-9>
- Jordan, J. J., Rand, D. G., Arbesman, S., Fowler, J. H., & Christakis, N. A. (2013). Contagion of cooperation in static and fluid social networks. *PLoS ONE*, *8*(6), e66199. <https://doi.org/10.1371/journal.pone.0066199>
- Joshanloo, M. (2014). Eastern Conceptualizations of Happiness: Fundamental Differences with Western Views. *Journal of Happiness Studies*, *15*(2), 475–493. <https://doi.org/10.1007/s10902-013-9431-1>
- Kanner, A. D., Coyne, J. C., Schaefer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine*, *4*(1), 1–39. <https://doi.org/10.1007/BF00844845>
- Khalil, E. L. (2011). The mirror neuron paradox: How far is understanding from mimicking? *Journal of Economic Behavior & Organization*, *77*(1), 86–96. <https://doi.org/10.1016/j.jebo.2009.12.005>
- Khare, S. K., Blanes-Vidal, V., Nadimi, E. S., & Acharya, U. R. (2024). Emotion recognition and artificial intelligence: A systematic review (2014–2023) and research recommendations. *Information Fusion*, *102*, 102019. <https://doi.org/10.1016/j.inffus.2023.102019>
- Kodack, E., Marsic, T., Lewis, K. P., & Patel, A. (2024). World Kindness Day 2024: Let's make kindness contagious. *ASA Monitor*, *88*(10), 13–14. <https://doi.org/10.1097/01.ASM.0001069360.54237.6e>
- Kostka, G., Steinacker, L., & Meckel, M. (2023). Under big brother's watchful eye: Cross-country attitudes toward facial recognition technology. *Government Information Quarterly*, *40*(1), 101761. <https://doi.org/10.1016/j.giq.2022.101761>
- Kret, M. E., Prochazkova, E., Sterck, E. H. M., & Clay, Z. (2020). Emotional expressions in human and non-human great apes. *Neuroscience & Biobehavioral Reviews*, *115*, 378–395. <https://doi.org/10.1016/j.neubiorev.2020.01.027>
- Kumar, A., & Epley, N. (2023). A little good goes an unexpectedly long way: Underestimating the positive impact of kindness on recipients. *Journal of Experimental Psychology: General*, *152*(1), 236–252. <https://doi.org/10.1037/xge0001271>
- LaFrance, M., Hecht, M. A., & Paluck, E. L. (2003). The contingent smile: A meta-analysis of sex differences in smiling. *Psychological Bulletin*, *129*(2), 305–334. <https://doi.org/10.1037/0033-2909.129.2.305>
- Last, J. M. (1983). *A Dictionary of Epidemiology*. Oxford University Press.
- Laughter, J. (2014). Toward a theory of micro-kindness: Developing positive actions in multicultural education. *International Journal of Multicultural Education*, *16*(2), 2–14.
- Leong, S. C., Tang, Y. M., Lai, C. H., & Lee, C. K. M. (2023). Facial expression and body gesture emotion recognition: A systematic review on the use of visual data in affective computing. *Computer Science Review*, *48*, 100545. <https://doi.org/10.1016/j.cosrev.2023.100545>
- Leu, J., Wang, J., & Koo, K. (2011). Are Positive Emotions Just as “Positive” Across Cultures? *Emotion*, *11*(4), 994–999. <https://doi.org/10.1037/a0021332>
- Levin, J. (2000). A Prolegomenon to an Epidemiology of Love: Theory, Measurement, and Health Outcomes. *Journal of Social and Clinical Psychology*, *19*(1), 117–136. <https://doi.org/10.1521/jsocp.2000.19.1.117>
- Levin, J. (2007). Integrating positive psychology into epidemiologic theory: Reflections on love, salutogenesis, and determinants of population health. In *Altruism and Health* (pp. 189–218). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195182910.003.0013>
- Levin, J. (2023). The epidemiology of love: Historical perspectives and implications for population-health research. *The Journal of Positive Psychology*, *18*(1), 34–43. <https://doi.org/10.1080/17439760.2022.2053876>

- Li, Y.-Z., He, T.-L., Song, Y.-R., Yang, Z., & Zhou, R.-T. (2018). Factors impacting donors' intention to donate to charitable crowd-funding projects in China: a UTAUT-based model. *Information, Communication & Society*, 21(3), 404–415. <https://doi.org/10.1080/1369118X.2017.1282530>
- Liu, X., Suolang, D., & Lu, X. (2020). Influence of religions in the development of hospitality culture in Asia—The case of Tibet. In *Tourism Product Development in China, Asian and European Countries* (pp. 153–163). Springer Singapore. [https://doi.org/10.1007/978-981-15-4447-7\\_9](https://doi.org/10.1007/978-981-15-4447-7_9)
- Lomas, T., Cartwright, T., Edginton, T., & Ridge, D. (2014). A religion of wellbeing? The appeal of Buddhism to men in London, United Kingdom. *Psychology of Religion and Spirituality*, 6(3), 198–207. <https://doi.org/10.1037/a0036420>
- Lomas, T., Cartwright, T., Edginton, T., & Ridge, D. (2016). New ways of being a man: “Positive” hegemonic masculinity in meditation-based communities of practice. *Men and Masculinities*, 19(3), 289–310. <https://doi.org/10.1177/1097184X15578531>
- Lomas, T., Diego-Rosell, P., Shiba, K., Standridge, P., Lee, M, T., & Lai, A. Y. (2022). Complexifying individualism versus collectivism and West versus East: Global diversity in perspectives on self and other in the Gallup World Poll. *The Journal of Cross-Cultural Psychology*, 54(1), 61–89. <https://doi.org/10.1177/00220221221130978>
- Lomas, T., & VanderWeele, T. J. (2024, December 8). A positive epidemiology of kindness: Transmission dynamics of acts of microkindness. *Kindfulness Symposium: Cultivating Happiness, Compassion & Resilience*. <https://www.tszshansymposium2024.org/>
- Lukianoff, G., & Haidt, J. (2019). *The Coddling of the American Mind: How Good Intentions and Bad Ideas are Setting up a Generation for Failure*. Penguin.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224–253. <https://doi.org/10.1037/0033-295X.98.2.224>
- McLeod, K. S. (2000). Our sense of Snow: the myth of John Snow in medical geography. *Social Science & Medicine*, 50(7–8), 923–935. [https://doi.org/10.1016/S0277-9536\(99\)00345-7](https://doi.org/10.1016/S0277-9536(99)00345-7)
- McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27(1), 415–444. <https://doi.org/10.1146/annurev.soc.27.1.415>
- Nasie, M., Reifen Tagar, M., & Bar-Tal, D. (2021). Ethno-political socialization of young children in societies involved in intractable conflict: The case of Israel. *Journal of Social Issues*, 77(4), 1257–1281. <https://doi.org/10.1111/josi.12479>
- Neely, M. E., Schallert, D. L., Mohammed, S. S., Roberts, R. M., & Chen, Y.-J. (2009). Self-kindness when facing stress: The role of self-compassion, goal regulation, and support in college students' well-being. *Motivation and Emotion*, 33(1), 88–97. <https://doi.org/10.1007/s11031-008-9119-8>
- Neff, K. D. (2023). Self-compassion: Theory, method, research, and intervention. *Annual Review of Psychology*, 74(1), 193–218. <https://doi.org/10.1146/annurev-psych-032420-031047>
- Okur, S., Akyıl, Y., Deniz, M. E., & Satıcı, S. A. (2024). How does more niceness bring more happiness? The association between niceness, depression, and subjective happiness. *Psychological Reports*. <https://doi.org/10.1177/00332941241278335>
- Otterbring, T. (2017). Smile for a while: The effect of employee-displayed smiling on customer affect and satisfaction. *Journal of Service Management*, 28(2), 284–304. <https://doi.org/10.1108/JOSM-11-2015-0372>
- Pierce, C. (1970). Offensive mechanisms. In F. Barbour (Ed.), *The Black Seventies* (pp. 265–282). Porter Sargent.
- Pierce, C. (1995). Stress analogs of racism and sexism: Terrorism, torture, and disaster. In C. Willie, P. Reiker, B. Kramer, & B. Brown (Eds.), *Mental Health, Racism, and Sexism* (pp. 277–293). University of Pittsburgh Press.
- Porche, D. J. (2023). *Epidemiology Primer. Epidemiology for the Advanced Practice Nurse: A Population Health Approach*. Springer.
- Puntarigivat, T. (1998). Toward a Buddhist social ethics: The case of Thailand. *CrossCurrents*, 48(3), 347–365. <https://www.jstor.org/stable/24460820>

- Rychlowska, M., Miyamoto, Y., Matsumoto, D., Hess, U., Gilboa-Schechtman, E., Kamble, S., Muluk, H., Masuda, T., & Niedenthal, P. M. (2015). Heterogeneity of long-history migration explains cultural differences in reports of emotional expressivity and the functions of smiles. *Proceedings of the National Academy of Sciences*, 112(19). <https://doi.org/10.1073/pnas.1413661112>
- Schoenewolf, G. (1990). *Turning Points in Analytic Therapy: The Classic Cases*. Jason Aronson Press.
- Shonin, E., Van Gordon, W., Compare, A., Zangeneh, M., & Griffiths, M. D. (2015). Buddhist-derived loving-kindness and compassion meditation for the treatment of psychopathology: a Systematic Review. *Mindfulness*, 6(5), 1161–1180. <https://doi.org/10.1007/s12671-014-0368-1>
- Song, R., Over, H., & Carpenter, M. (2016). Young children discriminate genuine from fake smiles and expect people displaying genuine smiles to be more prosocial. *Evolution and Human Behavior*, 37(6), 490–501. <https://doi.org/10.1016/j.evolhumbehav.2016.05.002>
- Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A. M. B., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: Implications for clinical practice. *American Psychologist*, 62(4), 271–286. <https://doi.org/10.1037/0003-066X.62.4.271>
- Thoits, P. A. (1989). The sociology of emotions. *Annual Review of Sociology*, 15(1), 317–342. <https://doi.org/10.1146/annurev.so.15.080189.001533>
- Toraif, N., Gondal, N., Paudel, P., & Frisellaa, A. (2023). From colorblind to systemic racism: Emergence of a rhetorical shift in higher education discourse in response to the murder of George Floyd. *PLOS ONE*, 18(8), e0289545. <https://doi.org/10.1371/journal.pone.0289545>
- Tsai, J. L. (2007). Ideal Affect: Cultural Causes and Behavioral Consequences. *Perspectives on Psychological Science*, 2(3), 242–259. <https://doi.org/10.1111/j.1745-6916.2007.00043.x>
- Tsai, J. L., Ang, J. Y. Z., Blevins, E., Goernandt, J., Fung, H. H., Jiang, D., Elliott, J., Kölzer, A., Uchida, Y., Lee, Y.-C., Lin, Y., Zhang, X., Govindama, Y., & Haddouk, L. (2016). Leaders' smiles reflect cultural differences in ideal affect. *Emotion (Washington, D.C.)*, 16(2), 183–195. <https://doi.org/10.1037/emo0000133>
- Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, 90(2), 288–307. <https://doi.org/10.1037/0022-3514.90.2.288>
- Tsai, J. L., Levenson, R. W., & Carstensen, L. L. (2000). Autonomic, expressive and subjective responses to emotional films in younger and older adults of European American and Chinese descent. *Psychology and Aging*, 15, 684–693. <https://doi.org/10.1037//0882-7974.15.4.684>
- Tsai, J. L., Levenson, R. W., & McCoy, K. (2006). Cultural and temperamental variation in emotional response. In *Emotion* (Vol. 6, Issue 3, pp. 484–497). American Psychological Association. <https://doi.org/10.1037/1528-3542.6.3.484>
- Tsai, J. L., Louie, J. Y., Chen, E. E., & Uchida, Y. (2007). Learning What Feelings to Desire: Socialization of Ideal Affect Through Children's Storybooks. *Personality and Social Psychology Bulletin*, 33(1), 17–30. <https://doi.org/10.1177/0146167206292749>
- Tsai, J. L., Miao, F. F., & Seppala, E. (2007). Good Feelings in Christianity and Buddhism: Religious Differences in Ideal Affect. *Personality and Social Psychology Bulletin*, 33(3), 409–421. <https://doi.org/10.1177/0146167206296107>
- Tsai, J. L., Miao, F. F., Seppala, E., Fung, H. H., & Yeung, D. Y. (2007). Influence and adjustment goals: sources of cultural differences in ideal affect. *Journal of Personality and Social Psychology*, 92(6), 1102–1117. <https://doi.org/10.1037/0022-3514.92.6.1102>
- Uchida, Y., & Kitayama, S. (2009). Happiness and unhappiness in east and west: Themes and variations. *Emotion*, 9(4), 441–456. <https://doi.org/10.1037/a0015634>
- Valente, T. W. (1996). Social network thresholds in the diffusion of innovations. *Social Networks*, 18(1), 69–89. [https://doi.org/10.1016/0378-8733\(95\)00256-1](https://doi.org/10.1016/0378-8733(95)00256-1)
- Valente, T. W., & Vega Yon, G. G. (2020). Diffusion/contagion processes on social networks. *Health Education & Behavior*, 47(2), 235–248. <https://doi.org/10.1177/1090198120901497>
- VanderWeele, T. J. (2023). On an analytic definition of love. *Journal of Ethics and Social Philosophy*, 25(1). <https://doi.org/10.26556/jesp.v25i1.2695>

- VanderWeele, T. J., & Brooks, A. C. (2023). A public health approach to negative news media: The 3-to-1 solution. *American Journal of Health Promotion*, 37(4), 447–449. <https://doi.org/10.1177/0890117120914227>
- VanderWeele, T. J., Chen, Y., Long, K., Kim, E. S., Trudel-Fitzgerald, C., & Kubzansky, L. D. (2020). Positive epidemiology? *Epidemiology*, 31(2), 189–193. <https://doi.org/10.1097/EDE.0000000000001147>
- VanderWeele, T. J., & Lee, M. T. (2025). Love and human flourishing. *International Journal of Wellbeing*, 4(15). <https://doi.org/10.5502/ijw.v15i4.4663>
- Walker, P., & Laughter, J. (2019). Shoaling rhizomes: A theoretical framework for understanding social media's role in discourse and composition education. *Computers and Composition*, 53, 60–74. <https://doi.org/10.1016/j.compcom.2019.05.005>
- Wang, J. (2015). NGO2.0 and social media praxis: Activist as researcher. *Chinese Journal of Communication*, 8(1), 18–41. <https://doi.org/10.1080/17544750.2014.988634>
- World Health Organization. (2024). Disease Outbreaks. *World Health Organization*. <https://www.emro.who.int/health-topics/disease-outbreaks/index.html>
- Zhao, X., & Epley, N. (2021). Kind words do not become tired words: Undervaluing the positive impact of frequent compliments. *Self and Identity*, 20(1), 25–46. <https://doi.org/10.1080/15298868.2020.1761438>