Collective Effervescence as Self-Organization and Enaction

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Abstract: Collective effervescence is a group experience of intense collective affect. It includes feelings of being "swept away" and "becoming one with the crowd" and often a sensation of "awe" and being in touch with the sacred. Empirical research demonstrates that collective effervescence is connected to several short- and long-term psychological and physical benefits. The growing field of 4E cognition (enactive, embodied, embedded, and extended) takes cognition to be inherently social and affective. Yet surprisingly, despite the social, embodied, dynamic, and affective nature of collective effervescence, there is currently no 4E account of collective effervescence. I integrate the empirical literature on collective effervescence into 4E cognition. I argue that whenever there are high degrees of self-organizing bodily activity in a human crowd under the proper boundary conditions, there is collective effervescence. Collective effervescence *is* the experience of undergoing high degrees of self-organization in a crowd. Taking a 4E dynamic systems approach to collective effervescence demystifies the phenomenon and opens it up for potential use in public policy and therapy.

Keywords: Collective Effervescence, Embodied Cognition, Emergence, Enaction, Collective Emotion

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1. INTRODUCTION

Popular culture is full of narratives about people undergoing "life-changing" experiences at concerts, dance parties, weddings, festivals, religious ceremonies, political rallies, protests, outdoor gatherings, and more. Many of the cultural events that have a lasting existential impact on human beings are those events that bring about collective effervescence. First coined by Émile Durkheim (1912) collective effervescence is a *group experience* of intense affect, being "swept away," "becoming one with the crowd," and often includes a sensation of awe. In addition, collective effervescence is often tied to an experience of "the sacred." Decades of empirical research demonstrate that collective effervescence is connected to short and long-term psychological and physical benefits (Pizarro et al., 2022; Rimé and Páez, 2023). I make here an enactive and dynamic systems argument:

- Collective effervescence is the experience of human beings undergoing high degrees of self-organization in a crowd.
- When we experience collective effervescence, we are experiencing self-organization.

Self-organization is a phenomenon in which, without a leader or centralized plan, multiple processes interact and form a new meta-stable self-perpetuating dynamic system that, via emergence, is qualitatively different than the sum of its parts Camazine et al. (2020).

Within recent history, the cognitive sciences (including philosophy of mind) have undergone a "social turn" (De Jaegher, 2018). A new blossoming field of 4E cognitive science (enactive, embodied, embedded, and extended) investigates cognition as an inherently social and affective phenomenon (Colombetti, 2014; Gallagher, 2020; Di Paolo et al., 2018; Maiese, 2016b, 2022; Varela et al., 1991; Thompson, 2007). However, despite the social and embodied nature of collective effervescence, there is no 4E cognition model that addresses the phenomenon. Cognitivist models of mind have also largely ignored collective effervescence. In addition, collective effervescence has historically, for colonialist reasons, been tied to irrational behavior (Waddington, 2008; Le Bon, 1895; Ehrenreich, 2007; Thonhauser and Wetzels, 2020). Hence, we need a better cognitive account of collective effervescence that considers its affective, social, embodied, and dynamic features.

Self-organization is only necessary but not sufficient for collective effervescence. Collective effervescence also requires several social-cultural

conditions and other boundary conditions. We simply cannot sway in unison and expect to enter a state of collective effervescence. For one, agents need to be in a "crowd" (a concept defined in terms of physical space), and the "occasion" must sufficiently stand out from the mundane; physical and social conditions highly dictate collective effervescence. For example, a small Brooklyn apartment hosting an underground punk show can only hold twenty-five people. The physical constraints of the space and the exclusiveness of the event make twenty-five people "feel" and operate as a crowd. However, placed in a stadium, twenty-five people will not function or be experienced as a crowd, and collective effervescence will not be possible. The physical agency and constraints of a place dictate many of the boundary conditions for collective effervescence (Malafouris, 2013). A space must "feel" packed, and be closer toward physical capacity to enable collective effervescence (Liebst, 2019; Vine, 2023).

The paper proceeds in the following order. I first outline the phenomenon of collective effervescence and its boundary conditions. Next, I outline the dynamic systems concept of self-organization and demonstrate how the activities that produce collective effervescence are constituted by self-organization with an emphasis on extended affect. We then move into an enactive and embodied explanation of the process of self-organization in collective effervescence, arguing that collective effervescence is not epiphenomenal—rather, collective effervescence is from an enactive and embodied perspective, the experience of undergoing strong self-organization with other agents. I end with some preliminary commentary on why taking this dynamic and enactive account to collective effervescence is fruitful for science, public art, therapy, and cultural policymaking.

2. COLLECTIVE EFFERVESCENCE

First coined by sociologist Émile Durkheim in 1912 "collective effervescence" denotes a group experience of exaltation, intense affect, emotion, awe, and an experience of "being drawn into" and "becoming one with the crowd" (Durkheim, 1912). Experiences that are typically associated with collective effervescence include group religious worship, concerts, sports games, crowd dancing, group marching, rallies, protests, and other forms of large gatherings with a focal point towards a joint activity. Collective effervescence is experienced as "powerful" and takes place when a group performs a joint action with a single or multiple joint foci of attention. Collective effervescence typically creates a sense of intense shared energy, enthusiasm, and a heightened

sense of belonging and unity, among the participants.

While Durkheim originally focused on religious ritual, the phenomenon of collective effervescence has been documented in a myriad of group activities including; festivals, nightclubs, dance groups, concerts, protest marches, political rallies, sporting events, tailgating, and other communal activities where individuals come together to engage in shared practices with a joint goal (Malbon, 2002; St John, 2004; Sylvan, 2013; Pizarro et al., 2022; Zumeta et al., 2020). In fact, as demonstrated by Ehrenreich engineering collective effervescence for political stability or for political resistance has been integral to the fabric of societies around the world since the beginning of recorded history (Ehrenreich, 2007).

In Durkheim's original account of collective effervescence, the co-presence of people *amplifies* emotion, affect, and intentions. In other words, the more people together in a collective ritual the more powerful the psychological and physical effects (Durkheim, 1912). To overcome the hardships of existence, communities group together for collective rituals to amplify emotional experiences essential for survival and thriving. Community norms, rules, and hierarchies are further enforced through the collective experience, and grit is instilled within community members. In other words, grouping together for collective effervescence strongly entrenches the narratives, rules, norms, emotions, affect, and intentions necessary for a community's survival and stability. Collective effervescence reinforces a sense of collective conscience and reinforces shared values, thereby promoting a sense of purpose and belonging (Rimé and Páez, 2023). For Durkheim, collective effervescence is the glue that keeps a community together and must, therefore, frequently be repeated for the effect not to wear off. In this way, collective effervescence can contribute to the maintenance of social order and stability.

Collective effervescence is an interesting social process in part because it does not require pre-established social bonds with any one particular individual:

> In summary, there is evidence that people can fill belongingness needs and gain a greater sense of meaning in life from engaging in group activities, even if they have no existing dyadic bonds with the other people present. (Gabriel et al. 2020, 3)

In fact, one of the consistent findings regarding collective effervescence is that it is an experience that generates connection with and care for others despite not knowing any specific others (Rimé and Páez, 2023; Pizarro et al.,

2022). This, in turn, explains why political leaders often attempt to use collective effervescence as a tool to solidify their constituent base (Cariton-Ford, 1992). Relatedly, as pointed out by Pizarro and colleagues (Pizarro et al. 2022, 2), collective effervescence does not have to be targeted toward positive emotions. Collective effervescence can amplify any emotion or affect including sorrow, anger, hatred, and more. This phenomenon is apparent in the use of collective effervescence to amplify hatred in Nazi marches or Trump rallies in the contemporary United States (Zembylas, 2020; MacDonald, 2022). Durkheim himself studied collective effervescence during social rituals centered around grief, such as funerals (Durkheim, 1912). For Durkheim, collective effervescence should be understood as a mechanism of amplification and a qualitative change in experience, not a specific set of emotions.

Whether through religious ritual, political rallies, dance, music making, concert going, and so on, during moments of collective effervescence, each individual experiences a temporary dissolution of individual boundaries and a merging of their self-experience with the collective. Collective effervescence is therefore also tied to a drift in self-experience from individual agency to joint agency with the end state of collective effervescence being of highly joint agency (Kronsted, 2023). This drift in self-experience towards collective experience is often described as "becoming part of something bigger than oneself" (Malbon, 2002; Van Cappellen and Rimé, 2013; Yaden et al., 2017). For example, qualitative in-depth studies on club dancers demonstrate a strong experience of merger within collective effervescence:

> In this unspeakable, non-thematic and nonconceptual state, boundaries between fundamental oppositions (mind/body, self/other, etc.) are dissolved; you experience no distinctions between your mind, your body, the minds and bodies of others. (Gavanas 2008, 129)

> The paradoxical in-betweeness of these moments—fleeting sensations of both losing control yet also finding control—can result in sensations of exstasis, of the dancer losing a sense of him or herself as a separate entity, of becoming part of or identifying strongly with something outside and beyond, yet also including, themselves. (Malbon 2002, 144)

In step, collective effervescence is therefore often also associated with the experience of *awe* (Keltner and Haidt, 2003; Rimé and Páez, 2023). Typically, as the agent moves from an individualized experience towards the collective experience, they also undergo an experience of being connected to something

vast or immense, which subsequently makes them feel small or minuscule—awe (inside and outside of collective effervescence) is connected to a diminished sense of self (Bai et al., 2017). Importantly, the experience of awe has been empirically shown to be connected with an increase in concern for others and an increase in concern for the collective (Van Cappellen and Saroglou, 2012; Van Cappellen and Rimé, 2013). In fact, a recent review of the empirical literature demonstrates that awe is connected with long-term physical and psychological health benefits and long-term concern for others and community (Monroy and Keltner, 2023).

Interestingly, from the various review articles on the empirical literature of both awe and collective effervescence, a pattern emerges. The activities that create an experience of awe are often also the activities that tend to create an experience of collective effervescence (Monroy and Keltner, 2023; Rimé and Páez, 2023; Pizarro et al., 2022). However, while some experiences, such as hiking alone, can cause a sensation of awe, doing such activities alone does not produce collective effervescence. Collective effervescence often produces a feeling of awe, but awe does not have to come with collective effervescence. For our purposes, the important notion is that the activities that cause both awe and collective effervescence are the ones that require synchronized human movement and self-organization (dancing, singing, marching, sports cheering, religious chanting, etc.).

2.1. Interaction and Shared Attention

Durkheim's original account of collective effervescence is fairly barebones. What is required for the process to emerge is the co-presence of multiple agents engaging in a joint activity:

> Durkheim believed that all that was necessary for collective effervescence was 'that men are assembled, that sentiments are felt in common and expressed in common acts; but the particular nature of these sentiments and acts is something relatively secondary and contingent' (1965, pp. 431–432). In other words, being together with others and engaging in some kind of common task – praying, watching a football game, listening to a band – can lead to collective effervescence even in the absence of a shared relational history. (Gabriel et al. 2020, 3)

We see that collective effervescence is agnostic to the activity itself if the participants coordinate their behavior in accordance with a shared focus of attention. However, empirical accounts of collective effervescence have also

established that *mere co-presence is not sufficient* (Vine, 2023; Liebst, 2019; Hopkins et al., 2016). As Hopkins and colleagues remind us; "Mere co-presence of several people does not constitute a psychological group or crowd. Rather, the formation of a psychological collectivity resides in shared acts of self-categorization" (Hopkins et al. 2016, 21). For example, thousands of people coordinating their paths through a crowded traffic intersection in Manhattan or Seoul is not sufficient to produce an experience of collective effervescence. Rather, agents must either gather with a preestablished shared identity to attend to the same thing(s) or shared attention must emerge from the interactions of agents in a crowd (Rimé and Páez, 2023). For example, people being in a busy square taking care of their individual actions (farmer's market shopping, coffee drinking, dog walking, email sending at the café, etc.) does not produce collective effervescence. However, if a band starts playing at the center of the square and the crowd comes together to enjoy the music, then the interactions of the experience can generate collective effervescence because a perspective of shared attention emerges from the interaction. In short, shared attention and shared identity are jointly necessary for collective effervescence. To get the phenomenon off the ground, a group can either start with shared attention, which will then lead to an (at least minimal shared identity), or they can start with a shared identity, leading to shared attention. However, not until both conditions are in place can collective effervescence emerge. Furthermore, it is important to remember that plenty of social interactions that have both shared attention and identity do not automatically lead to collective effervescence (for example, corporate board meetings or teacher-parent conferences).

The empirical literature on collective effervescence is consistent with the claim that a group of people must either have shared attention or a shared identity for the activity to be able to move toward an effervescence state (Gabriel et al., 2020; Schüler, 2017; Pizarro et al., 2022). Agents have to understand that they are "doing something together with the same aim" and that they hold some, even if minimal, shared identity (Jackson et al., 2019; Vesper et al., 2010). Starting with shared attention can often lead to group identity (Vesper et al., 2010). For example, festival-goers with wildly different identities get together to attend to their favorite artists performing live. In doing so, the audience begins to form a (if thin) shared identity as "us the audience, who are doing this together" (Salmela and Nagatsu, 2017). Starting with a shared identity can just as quickly lead to shared attention. For example, religious pilgrims meeting on the road might decide to travel and chant together. Once in place, the experience of collective effervescence strongly

intensifies both (Hopkins et al., 2016; Ehrenreich, 2007). Shared attention not only means attending to the same target(s) but also simultaneously being aware that the other agent is attending to the same target(s) and that the attending is being done so *together* (Krueger, 2014). There is a strong qualitative change in an agent's experience when something is attended to collectively rather than individually (Thonhauser and Weichold, 2021). Krueger uses the example of the affective intensity and qualitative sound of music in large live audiences (exactly the kinds of settings that often produce collective effervescence):

> Specifically, consider the character of listening to live music in a concert setting. Within this context, the presence of others—their behavioral and emotional responses to the music—modifies how the music is brought to phenomenal presence within our own experience. The music sounds somehow different when we listen to it with others—it takes on different phenomenal shape—because their mutual attention and emotional responses to the music shape the felt character of my own experience in a subtle way […] [T]hose attending are not just aware of the object but simultaneously of the other's awareness of the object. (Krueger 2014, 548)

In the case of music, shared attention gives rise to an experience of mutual awareness of togetherness. In collective effervescence, as in most socially mediated interactions, shared attention, emotion, and affect are tightly connected. Shared attention has been robustly empirically shown to create a shared perspective and a shared experience of togetherness (Tomasello, 2019). The affective experience of "becoming one with something bigger" can often begin by establishing shared attention. We learn then that collective effervescence needs simultaneous shared attention and shared identity. However, the process can begin from any one of these conditions.

Another overarching takeaway from theoretical and empirical work on collective effervescence is that the phenomenon ultimately requires repeated recursive interaction. At a glance, it might seem obvious that collective effervescence requires interaction, but we must be careful not to lump collective effervescence in with other constructs, such as awe or aesthetic experience of the sublime, which do not necessarily require human interaction (Nanay, 2016; Keltner and Haidt, 2003; Monroy and Keltner, 2023). Collective effervescence is not awe since awe can be experienced in isolation. Similarly, collective effervescence is not aesthetic sublimity since this can also be experienced in solitude. However, many collective effervescence experiences can contain awe

and/or aesthetic sublimity. Collective effervescence is an inherently social and interactive phenomenon—a point that becomes important as the argument progresses.

2.2. Synchronization

The first important step in the argument is to point out a simple but overlooked aspect of the empirical literature on collective effervescence. The activities that produce collective effervescence all contain high degrees of inter-bodily synchronization through body-to-body coupling.

Bodily synchronization takes place across a myriad of channels including; brain to brain synchronization, gesture, speech, gait, posture, eye patterns, hormonal synchronization, sensorimotor synchronization, and many more (Mogan et al., 2017; Dumas et al., 2011; Goldstein et al., 2018; Richardson et al., 2008). When human bodies interact, they quickly fall into coupled synchronized relationships of oscillation. That is, across multiple timescales and processes, human bodies in coupled interaction naturally fall into cascading relationships of in-phase, anti-phase, quadrature, lag-phasing, and more (Kelso, 2021, 1995). Rather than human movement being unrelated and chaotic when interacting, our behaviors cohere into recursive interconnected patterns across brain, body, environment, and cultural practices (Gallagher, 2020; Maiese, 2022; Hipólito et al., 2021; Di Paolo et al., 2017).

All of the activities that are stables in the collective effervescence literature include and rely on high degrees of coupled human inter-bodily synchronization: chanting, praying, dancing, singing, clapping, marching, sports spectating, and so on (Schüler, 2017; Zumeta et al., 2020). As empirical research has shown, people standing together watching sports (soccer, tennis, American football, etc.) do not automatically experience collective effervescence. It is not until synchronization kicks in that audience members can experience collective effervescence (Schüler 2017, 371). The critical point across the empirical literature is that collective effervescence occurs as people partake in bodily synchronizing activities (rocking, clapping, stepping, bopping, etc.). Again, co-presence is not enough for collective effervescence (Vine, 2023).

3. SELF-ORGANIZATION

With a rudimentary understanding of interbody synchronization, we can move into the next step of the argument: Collective effervescence is the experience of human beings undergoing high degrees of self-organization in a crowd. One thing is to understand that human bodies fall into synchronization when interacting. Another thing is to understand the product of *many* bodies moving in synchrony. Once multiple bodies move in synchrony, the product is a dynamic, non-linear, self-organizing emergent system with properties that cannot be reduced to the summation of its parts. Collective effervescence is such an emergent, highly complex, dense, self-organizing emergent system. To understand this claim, let's unpack self-organization.

Chemical reactions, organization of cells in bodies, patterns of sand on the beach, global and local weather patterns, bird flocking, fish schools, termite mounds, whirlpools in a bathtub, human group behavior—In the natural world, self-organization is a ubiquitous phenomenon. Simply put, we find self-organization across all scales of analysis. As Feiten and colleagues concisely summarize:

> A self-organizing system is a system that exhibits regularities that arise without a plan or leader but emerge from the interactions of the parts of the system. […] Self-organizing systems have their organization without a plan or controller. (Feiten et al. 2023, 314)

The organization of the system *emerges* from the interactions between local components or agents within the system. Each component follows simple rules or principles, and the collective behavior that arises from these interactions leads to the emergent order. In other words, self-organizing systems typically arise from individual components simply "doing their thing." When within appropriate proximity, each component or agent becomes *coupled,* which in turn changes the nature of their interactions, a form of circular bottom-up, top-down causality (Fuchs, 2020; Santos, 2024). One classic example is stigmergy and dense heterarchy in ant and termite colony building (Camazine et al., 2020; Walleczek, 2006). When placed with distance between them, individual ants will perform behaviors without impacting one another. However, when placed within proximity, the same behaviors will begin creating a hive, and the very physical structure of the hive, in turn, changes how each ant behaves. In humans, we often see this kind of self-organized behavior in crowded pedestrian traffic. Without anyone pedestrian "taking the lead," pedestrians often walk in highly synchronized patterns as if one organism is solving

complex problems (for example, crossing an intersection with multiple cars dangerously stopped in the middle of their pathway).

In the case of collective effervescence, each participant in the crowd is a component of the system whose activity aids in generating that system while simultaneously being causally impacted by the system. Think here of the intense affective and volatile experience of religious worshippers in musically or sonically driven practices (for example, AME church sermons, Buddhist chanting, Islamic Tawaf rituals, totem dances, and the list goes on). In each case, synchronized activity from individuals generates the experience of being "in a crowd," and once "in the crowd," the crowd causally impacts each individual—a circular and recursive form of causation (Santos, 2024). Central to these experiences is that from the activity of the crowd *emerges* a new qualitatively different system and qualitatively different experience (Favela and Chemero, 2023; Wimsatt, 2007). To help us, we can think back to the example by Krueger (2014): once in a crowd listening to music together, the qualitative character of the music changes. This new quality of the music further pulls in the crowd, pushing them into further elation.

The phenomenon of emergence is central to self-organization. From the activity of each component *emerges* a complex structure (for example, "the crowd"), which, in turn, causally re-impacts each of the components. If it is difficult to think of crowds as entities that can be experienced, think of another perhaps more relatable example—namely "the dance floor." When at a party, at first, no one is on the dance floor. Thus, interactions might be restrained or perhaps awkward. However, as more people enter the dance floor, the interactions become more fluid and are experienced as being "in" a crowd. As this happens, each agent loosens up and dances more intensely, which enhances the experience of "the dance floor" and typically brings in even more people (creating a self-strengthening feedback loop). The emergent structure of the "dance floor" re-impacts each participant, who in turn re-creates the crowd with more dancing vigor (Kronsted, 2023). Emergence is the appearance of complex patterns or properties at a higher level of organization that cannot be directly predicted from individual components' properties and exists in a circular bottom-up, top-down, causal relationship. Bumping dance floors, catching the holy ghost, and crazed crowds at the political rally are all self-organizing emergent phenomena, and so is collective effervescence.

As pointed out by Feiten et al. (2023) above, self-organizing systems tend to behave as one organism with a centralized mind despite having *no centralized control.* For example, in bird flocks, fish schools, ant swarms, and other animal groups that display highly sophisticated behaviors, the behavior

of each agent can be understood by a set of simple differential equations that relate the speed and trajectory of the agent to the speed and directory of its neighbors—centralized behavior without centralized control (Favela and Chemero, 2023; Kiefer et al., 2017). In collective effervescence, one classically reported experience is that the crowd seems to move with a will of its own (Gavanas, 2008; Case, 2021; Malbon, 2002; Ehrenreich, 2007; Gotman, 2017). Because of tight coupling and synchronization, the emerging joint system can demonstrate behaviors far beyond the capacities of the sum of its parts without a centralized control mechanism.

Many of the prime candidate activities that produce collective effervescence do so when the crowd system engages in emergent self-organizing activities without centralized control. Chanting, bowing, clapping, screaming, swaying, dancing, and so forth are all activities that function without centralized control and undergo self-organization (Ellamil et al., 2016; Høffding, 2019; Cochrane, 2017). Clapping usually starts as a chaotic activity and organizes itself into a steady synchronized pattern. Musical clapping will often move in and out of various phase relationships. For example, clapping might start as chaotic, move into in-phase synchronization, back to chaos, into syncopated clapping, back to in-phase claps, and so on. The phase changes of self-organized activity often drive the activities of crowds undergoing collective effervescence.

3.1. Extended Emotions and Affect

One strength of studying collective effervescence through the lens of self-organization is that it also allows us to understand the phenomenon's collective affect. Collective effervescence most typically involves a strong feeling of *collective* awe, excitement, and "becoming one with the crowd." Such reports are mysterious if we operate within a cognitivist framework in which emotions are purely internal. However, a wealth of recent research demonstrates that emotions and affect can, in fact, be constitutively extended and collective (Krueger, 2014; Krueger and Szanto, 2016; Slaby et al., 2019; Colombetti, 2014).

In line with second-wave extended mind theory (Menary, 2012), extended emotion theory argues that if an emotion or affect cannot be produced in isolation but must rather rely on coupling with external agents or objects to exist then that emotion is extended:

> [T]he emotion is not a psychological property of an individual. Rather, two or more individuals are bearers of the same emotion. These cases are therefore distinct from [individually extended emotions] in that the individuals making up the group do not possess the emotion prior to or simultaneous with the group's formation (Wilson 2004, p. 281). Rather, the emotion is something that emerges over time as a group-level trait; it extends across the various individuals making up the group without being reducible to any one member and is thus a collective achievement. (Krueger 2014, 536)

Part of what we learn here is that affect and emotion are often better thought of as dynamic systems. In this view, the feeling of being swept into the crowd is an emergent affective property of system interactions that can only occur through coupled interaction—emotions and affect are often relational. Similarly, the intensity of the affect in collective effervescence can only take place as a result of coupled self-organizing emergent interactions (Thonhauser, 2022).

The intense experience of collective effervescence is exactly collective because, as we have seen, the crowd functions as a dynamically *coupled* self-organizing emergent system. The affect is a relation between agents in the system. These are the kinds of interactions in which their coupling strength and dynamics become so overpowering that they lead to what Thonhauser calls "emotional fusion"—a temporary loss of the self-other distinction (Thonhauser 2022, 39). The qualities of collective affect come from the many coupled synchronization processes that self-organize into a larger whole, with the emotions and affect being emergent properties of the system. Affect and emotion are collective because they are relational—not internal mental states.

We can think of each environment and the agents within it as a large affective self-organizing system or, what Slaby and colleagues dub, an affective arrangement (Slaby et al., 2019). The focus on "affective arrangements" further demonstrates how emotions and affect are *relational* rather than individual mental states. Affective arrangements are spatial-temporal zones within which a variety of coupling relations (often dictated by social and cultural norms) produce specific unique affective atmospheres and collective emotions. In other words, it feels different to be inside the affective arrangement than to be outside the affective arrangement (Slaby, Mühlhoff, and Wüschner 2019, 5). For example, think about the stark difference between the emotions and affect when standing in line outside a concert venue (perhaps in the cold) versus the atmosphere when one enters the venue. Another example is the distinct affect, emotions, and atmosphere that can exist within urban public spaces such as

plazas. The moment the agent leaves the plaza, the atmosphere, affect, and emotions vanish.

Like most other activities, collective effervescence takes place within affective arrangements. The dynamics of a small apartment are different from those of a stadium. Which again is different from a public square. In each of these cases, the constraints of the space determine the required size for crowdhood and the background atmosphere that enables interaction. For example, the social and cultural norms surrounding concert venues much easier lend themselves to volatile jubilation than the norms surrounding a funeral home. The material, cultural, and social factors of a space determine whether the conditions are right for a group to self-organize into a "crowd" and whether the space allows for the production of collective effervescence.

This means that collective effervescence is a paradigm case of *extended affect* (Slaby, 2014). The affect in collective effervescence is, importantly, not merely shared—I have an affective feeling, and it happens to be the same as your affective feeling. Rather, in collective effervescence, affect is truly collective—you and I *together* are creating and maintaining the affect, and we both know that this is *our* affect (Thonhauser, 2022). Collective effervescence is an affective system that is felt as collective and is maintained by the ongoing dynamical self-organizing interactions of several agents:

> There is nothing mysterious or super-natural about this: A collective emotion is simply a complex system of socially distributed components based on dynamical self-organization through social interaction. (Thonhauser 2022, 35)

However, it is important to note that affective extension only happens when an object causally impacts an agent, and the agent also causally impacts the object. Thus, smelling a candle does not count as an emotional extension because the person does not affect the candle. For emotional and affective extension, the causal relation must be bidirectional. In the case of multiple people achieving collective affect, the causal relationship is multidirectional between each agent since every agent is simultaneously causally impacting each other through their various types of coupling (Krueger and Szanto 2016, 867). Collective effervescence is a highly collectively affective system because of the multidirectional causal nature of self-organizing systems.

We can further explain the emotional and affective intensity of collective effervescence through the notion of positive feedback. Positive feedback loops play a crucial role in self-organization. In many organisms much of their

behavior can be seen as negative feedback—the organism falls outside of equilibrium and must therefore act to reestablish the equilibrium (Camazine et al., 2020; Walleczek, 2006). Commonly, the animal is hungry or thirsty and must, therefore, seek food and water to reestablish equilibrium. While negative feedback dampens behavior, positive feedback amplifies behavior. Self-organization interestingly functions via positive feedback loops. Once starting to self-organize, doing a behavior leads to more of the behavior. This phenomenon is sometimes captured on video in which hundreds of sheep, deer, ants, or other animals walk in tight, organized circles for extended periods of time (sometimes known as milling). Complexity and density in self-organizing systems often lead to a positive feedback loop through which the system perpetuates itself. This, in turn, explains the strong affective and emotional intensification that takes place during collective effervescence.

The relationship between self-organization and positive feedback is evident in cases of collective effervescence and its collective affect. The activities that produce collective effervescence tend to be those that include positive feedback loops. Chanting leads to more chanting, cheering, and clapping pulls more members into the activity, catching the holy ghost is contagious, dancing is alluring when more people are already on the floor, and anger is amplified at the political rally when others display their anger. In each case, the collective effervescent experience is driven by self-organization, emergence, and positive feedback loops. Self-organization highly amplifies the relational affect and emotions in the system. As agents partake in collective actions, their affect qualitatively changes and enhances. This enhancement, in turn, leads to a repetition of the behavior, which further amplifies the affect—an ongoing positive feedback loop.

4. COLLECTIVE EFFERVESCENCE AND ENACTIVE EMBODIED COGNITION

The argument that collective effervescence *is* the experience of human beings undergoing high degrees of self-organization in a crowd, fits hand in glove with the blossoming field of enactive cognition. For enactive cognition, human movement and bodily processes are not the "results of antecedent" cognition. Rather, bodily processes and movement just "*is*" cognition Varela et al. (1991); Gallagher (2005, 2017); Thompson (2007); Hutto and Myin (2013); Di Paolo et al. (2018); Maiese (2022). Just as mental states are not different from their embodied processes (Hutto and Myin, 2017, 2013). Collective effervescence is not a state above and beyond self-organization. Rather, collective effervescence

is the affective experience of high degrees of self-organization in a human crowd.

For enactivism, much of our skillful cognitive activity is tied to bodily synchronization and self-organization. Our actions become materially, socially, and culturally coherent and meaningful as agents synchronize and organize from "brain-body-world" to "brain-body-world." Less cryptically, cognition is what we call the activities that self-organize and emerge when we look at brains, bodies, and environments as coupled complete systems (Fuchs, 2018, 2020). Cognition is not "in" the brain or even "in" the body. Rather, cognition is a set of self-organizational relations between things: "[Ask] not what is an agent? But when is an agent" (Malafouris 2013, 51). Thus, self-organization on the enactive model is part and parcel of cognition. When we successfully cognize together, our bodies synchronize their activities and self-organize those activities into coherent recursive patterns. For example, two friends walking together "coming up with ideas for TV Shows they would pitch to Netflix" involves walking in a synchronized pattern at a matching pace, with synchronized turns for speaking and listening, the synchronization of gestures, and much more (De Jaegher and Di Paolo, 2007; Kronsted et al., 2023). The speaking and exchange of "ideas" is fully part and parcel of the walking, posture matching, gaze tracking, attention locking, and so on, all self-organized into a perpetuating joint cognitive system. On the enactive model cognition is always facilitated by self-organization. Nested layers of self-organization all the way down to the most basic cognitive functions, and self-organization all the way up to the most advanced social-cultural multi-agent interactions (Di Paolo et al., 2017, 2018)—in this case, collective effervescence.

Thus, collective effervescence is not different in kind from other cognitive activities. Rather, collective effervescence is a continuation of the cognitive processes that we use for everyday social interaction. Collective effervescence, however, is an intensified version of those processes. This conclusion is consistent with the enactive view of affect and emotion. In this view, affect and emotion are fundamental to the way organisms make sense of the world—all cognition is permeated with affect (Colombetti, 2014). In fact, since affect is fundamental to having a living body, and, on this view, life and cognition are synonymous (Thompson, 2007), there is no cognition without affect (Colombetti, 2017). The intensification and sharing of affect that takes place in collective effervescence is, therefore, perfectly consistent with the intensification of synchronization and self-organizing processes between agents in the crowd. As we become more in sync with one another and start to form a joint system, the affect also becomes shared and constitutively

collective (Krueger, 2015; Tollefsen and Dale, 2018; Maiese, 2016a).

From an enactive perspective, the phenomenological reports of crowd members "becoming part of something bigger" make perfect sense, since each agent is literally, through their interactions, becoming part and parcel of a bigger system. In-depth studies on large dance crowds demonstrate that in the frenzy of the dance when interactions are the most in-synch across the crowd, individual movers experience a dissipation of the self as they become "part of something bigger" (Gavanas, 2008; Malbon, 2002; Ehrenreich, 2007; Gotman, 2017; Salkind, 2018). This is consistent with ethnographic research which demonstrates that violent rioting can produce feelings of being part of a bigger cause or entity (Case, 2021). This same feeling of merging into a shared identity and being part and parcel of a bigger entity is seen in religious pilgrimages as well as in Donald Trump political rallies (Mast, 2019; Hopkins et al., 2016). From religious worship to hip-hop concerts, meditative chanting, sports watching, improvised dancing, or infamous riots such as disco demolition night (Salkind, 2018; Frank, 2007); across activities descriptions of collective effervescence report agents experiencing becoming part and parcel of a bigger system or entity. This empirical data is consistent with the literature on group agency, which has carefully demonstrated that there is a distinct phenomenological feeling to "becoming" a group (Salmela and Nagatsu, 2017; Trcka, 2017; Thonhauser, 2022; Blomberg, 2018). Again, such descriptions are not peculiar from an enactive perspective since participants interact themselves into becoming part of an emergent, self-organizing, dynamic joint cognitive system. Just as our basic bodily experiences structure our language, "she *carries* her team," the experience of collective effervescence is structured by bodily self-organization. From the enactive embodied perspective, collective effervescence is the affective experience of undergoing self-organization with other people in a crowd.

4.1. Being at Capacity—Collective Effervescence versus Togetherness

It is, of course, important to understand that the argument that collective effervescence is the experience of self-organization does not entail that every time human social behavior self-organizes, people will experience collective effervescence. Collective effervescence is a rare phenomenon that happens under special circumstances, most typically when the physical constraints of a space make that space be "at capacity." Many self-organizing social activities produce strong feelings of co-presence but not necessarily collective effervescence. For example, research has shown that watching TV together

in a group can create subtle feelings of togetherness (Gabriel et al., 2020). Similarly, in human group interactions, very simple signs of similarity (like being assigned a similarly colored name tag) can create feelings of group cohesion and togetherness (Salice and Miyazono, 2020; Jackson et al., 2019). Many activities will create group identification and feelings of co-presence, but it is not until those activities are under the right conditions of density, complexity, and intensity, that collective effervescence takes place. We must remember that one of the main features of collective effervescence is to be swept up by or become one with the crowd.

Collective effervescence, then, is a "crowd experience." However, this brings up the old "when-does-a-pile-of-sand-become-a-heap-objection." How many people are needed for a group to become a crowd? Why can't a small band playing for six people experience collective effervescence? The answer is that a small band and six audience members technically can experience collective effervescence although it is a bit unlikely. What we have seen so far across the empirical literature is that collective effervescence takes place when the gathering of people operates and is experienced "as a crowd." As mentioned in the introduction, twenty-five people in a small Brooklyn apartment punk show are experienced as a volatile crowd because of the physical constraints of that setting. Twenty-five people in a stadium will likely not even produce an experience of togetherness. The physical constraints of the environment set the boundary parameters for the possibility of collective effervescence. A space must "feel" packed and be closer to physical capacity to facilitate collective effervescence (Liebst, 2019; Vine, 2023). As we saw in our discussion of collective emotions and affect, the affective arrangements within the physical parameters of a space facilitate the possibility of different affective experiences (Slaby et al., 2019). Thus, while collective effervescence is an experience that is uniquely a "crowd" experience, it is the constraints of the environment that determine when a group is indeed a crowd. It is, therefore, an empirical question unique to each group-space-coupling whether the group constitutes a crowd. The rule of thumb, however, is that the space is experienced as being packed. Given this case-by-case basis, future research must develop a more rigorous and hopefully quantitative method to determine crowdhood in each context. That task, however, is outside the constraints of this paper. For initial steps towards such an empirical approach, see Thonhauser and Weichold (2021); Slaby et al. (2019); Thonhauser (2022); Thonhauser and Wetzels (2020).

5. WHY IT MATTERS, UNDERSTANDING COLLECTIVE EFFERVESCENCE FOR RESEARCH, CULTURAL POLICY, AND THERAPY

I have argued that collective effervescence is the collective affective experience of dynamically undergoing self-organization with other humans in a crowd. However, why should we care? Until this point, the academic literature on collective effervescence has been stuck in a cognitivist framework that has largely attempted to reduce the phenomenon to an internal process despite its social nature (Schüler, 2017). Furthermore, literature on Durkheim has discredited Durkheim's ontological commitments to emergence and social objects, claiming that his work is inherently contradictory (Sawyer, 2002). However, as Sawyer points out, despite claiming that the social world is made from individuals, Durkheim strongly advocates for an emergentist and inherently social reading of human cognition (Sawyer, 2002). Understanding collective effervescence as the process of undergoing self-organization allows us to solve this seeming contradiction in Durkheim's work.

Understanding emergent systems such as crowds and their causal powers allows for a better understanding of social systems and social behavior and lets us take seriously the ontology of groups and other emergent entities. So far, there is no fully mature cognitive science of crowd cognition. With few exceptions most work studies dyads, and smaller groups (Kiefer et al., 2017). Understanding the relationship between collective effervescence and self-organization is the first step in creating a more robust cognitive science of crowd behavior.

Furthermore, understanding collective effervescence as self-organization allows us to demystify the phenomenon and coherently integrate the phenomenon with the rest of the new embodied, affective, and social cognitive science (the 4E cognitive sciences). For most of the 19th and 20th centuries, collective effervescence was not taken seriously as a phenomenon due to the individualized, internalist, and cognitive trends in psychology, philosophy, sociology, and more (Riger, 2002; Fodor, 1984; Turing, 1937; Le Bon, 1895). In fact, historically, and often still today, crowd behavior is considered unintelligent, malignant, or unworthy of study (Thonhauser and Wetzels, 2020; Ehrenreich, 2007; Gotman, 2017) . With the social and embodied turn in cognitive science, we are now able to provide a naturalized and scientific explanation of collective effervescence, assign it a place and role in the natural world, and separate it from lingering racist and elitist 19th-century colonialist thought.

As the literature demonstrates human beings have a strong need for social connection—even with people with which we have pre-established direct relationship connection (Gabriel et al., 2020). However, the connection between collective effervescence and self-organization indicates that the human need for social connection is likely more generally facilitated by self-organization. In other words, one of the mechanisms that help us fulfill the need for social connection is self-organization. It seems that at a fundamental level, we desire to experience self-organization. Approaching sociality from this perspective can help further explain the efficacy of art and movement therapies. Operationalizing collective effervescence could lead to new and effective group movement and music therapies.

Linking collective effervescence to self-organization also has ontological ramifications. As Chemero and Favela point out, as good scientists, we ought to have pluralist ontological commitments (Favela and Chemero, 2023). As the literature on collective intentionality has demonstrated there is a phenomenology to *becoming* and *being* a group (Trcka, 2017; Salmela and Nagatsu, 2016, 2017). Thus, via interview methodologies, we should be able to begin to systematically distinguish between the presence of individuals, groups, and crowds and thereby carefully isolate the experience of undergoing self-organization (Petitmengin, 2006; Høffding and Martiny, 2016).

Globally, urban planners, cultural departments, and city governments more generally look for justification and data to better improve cultural programming. Cultural programming is tied to the general quality of life in urban environments. Understanding the relationship between the human desire for collective effervescence and the long-lasting psychological impact of collective effervescent experiences can aid cultural policymakers justify funding for better public performance art. Having a summer concert series does not only bring in tourists; high-quality performance art experiences fulfill an important psychological need, thereby improving quality of life. While funding for the arts (especially public art) is often on the chopping block understanding the relationship between self-organization and collective effervescence can help fund and design better public programming for an overlap between public art and public health.

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