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Social Affinity Flow Theory (SAFT) and New Insights into the Systems Archetypes of Escalation and Tragedy of the Commons

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Social Affinity Flow Theory (SAFT) is a new theoretical framework based upon Constructal Law (Bejan & Zane, 2012) and explains how this law uniquely operates within human social systems, whether within small groups, non-profits, multinational corporations, or societies. We investigate the relationship between SAFT, systems thinking, and the two archetypes of Tragedy of the Commons and Escalation, two frameworks that have proven useful to leaders and decision-makers. SAFT expands the applicability of the two archetypes and uncovers new insights with implications for multiple domains of human activity, including the practice of management.

Systems thinking and its associated archetypes have informed management thinking for decades (Checkland, 1994). Originally conceived as a framework for analyzing problems of greater complexity, systems thinking was seen as the necessary interdisciplinary approach needed to handle problems humanity would face in the 21st century (Rousseau, 2015). The approach was to get past surface-level symptoms to see situations for what they were: interconnected sub-parts interacting below the surface that exert powerful influence upon system-level events. Along with systems thinking, an accompanying set of archetypes, depicted in the form of diagrams called Causal Loops Diagrams (CLDs), described recurring patterns of activity. In human systems, these recurring patterns elude immediate recognition by those involved because they occur over time and space (Senge, 1995; Kim, 2000). Consequently, different observers often see the individual effects but miss the interconnections visible from a more holistic and systems-based perspective. Thus, the various archetypes are powerful sense-making tools for decision-makers allowing them to gain situational clarity, better diagnose problems and then devise solutions.

More recently, a set of researchers independently developed a theoretical framework describing human behavior called Social Affinity Flow Theory (SAFT) (Gourdine et al, 2019). The genesis of the theory is the Constructal Law from physics which states, "a system will evolve over time to accommodate the flows that occur within it" (Bejan & Zane, 2012). Bejan and Zane posit that Constructal law is the science behind repeated, branching patterns found throughout nature and daily life. It explains the growth patterns of trees from a trunk to branches and then to twigs, the arcing of lightning strikes, airways within human lungs, river flow systems and even road traffic conducting the voluminous flow of cars via interstate highways, major boulevards, and then down residential side streets. Even more striking is this same law of flow is said to apply to human systems like organizations and societies. However, common observation shows there are paradoxes and contradictions within human systems that are difficult to explain by Constructal law alone. In short, SAFT is a bridging theory for Constructal law that explains the contradictions are due to human volition and the effect of psycho-social factors, which are not factors within inanimate systems. Once these factors, along with human communication, are included, flow within human systems follows the expectations of Constructal law. There are several behavior patterns within human systems that are predicted by SAFT which apply to this current research.

Our purpose here is to see where SAFT fits within systems thinking and if it represents a new archetype on its own or alternatively, enlarges the perspective of existing archetypes. Only by answering a sequence of research questions can this larger question be legitimately addressed. The research questions are:

Briefly, what is Social Affinity Flow Theory (SAFT) and how was it derived?

What are the major predictions of SAFT when describing behavioral flows within human systems?

What is systems thinking and how does it inform decision making by managers and leaders?

What are the major archetypes described under systems thinking, what is their purpose, and their qualifying characteristics?

Which systems archetypes bear the closest relationship to SAFT, and might it best expand upon?

Considering the behavioral patterns described by SAFT and comparing it to existing archetypes, what is SAFT's place relative to systems thinking?

Research Methodology

A semi-structured approach was taken in the literature review process. Though the researchers initially considered the systematic review outlined by Tranfield et al

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(2003) for strict duplicability of the article search, following this approach was not practical in this case. In contrast to the one article presenting SAFT, the field of systems thinking/theory and its archetypes are documented in a vast number of areas. For example, a search of the EBSCO system using just two popular databases (Academic Search Complete and Business Source Premier) with a basic search on "systems theory" (in quotes), limiting all search returns to "full text" and "peer reviewed" still yielded 10,718 articles to peruse, dating back to 1930.

Consequently, a more targeted sampling approach would be more appropriate. Any issues of researcher bias (one of the main motivations for using Tranfield et al's [2003] approach) would need to be addressed alternatively in our methodology and this is detailed in the next section, Planning the Review. We offer the summary table below as an outline of the process followed.

Planning the Review

Since SAFT deals with human social interactions, particularly within the domains of organizational study, management (and leadership) and social studies, this eliminated almost all articles related to the hard sciences and medicine, which was a considerable percentage. Another insight came from reviewing the list of research questions above, themselves formed from a step-by-step process to answer the main question of SAFT and its relationship to systems thinking. It was deduced that what was needed was not a meta- analysis of every major article on systems theory/thinking, but to sample enough articles to convey an acceptable understanding of the subject. This involved judgment sampling (Kuofie et al, 2011; Varasteh et al, 2019). Team members conducted independent reviews of the articles selected for inclusion/exclusion and reconciled their votes via clarification, dialogue, and re-voting.

To get an overview of usage of systems thinking, as well as sampling its significant trends and shortcomings identified in the literature, the search was enlarged by choosing select, retrospective articles summarizing several decades of systems thinking (Checkland, 1994; Dubrovsky, 2004; Rousseau, 2015). We also specifically chose two articles that the researchers came across in random searches and felt warranted inclusion. One was an investigation of the relationship between national COVID compliance and national culture (Maaravi et al., 2021). It not only related to SAFT (via culture, a psycho-social phenomena), but was also topical, and therefore considered of interest. A second article later emerged in our research (Ostrom, 2009) and conveyed a watershed of empirical findings, such that not including it would have greatly reduced the value of our work.

Further, two major predictions of SAFT, described under Conducting the Review (see RQ2), made a targeted approach more sensible when reviewing the various archetypes. In short, knowing the major predictions of SAFT, two systems thinking archetypes were chosen for closer analysis and these are also explored in a later section (see RQ5).

Conducting the Review

RQ1: Briefly, what is Social Affinity Flow Theory (SAFT) and how was it derived?

As mentioned in the Introduction, SAFT is derived from physics' Constructal Law (Bejan and Zane, 2012) and describes flow patterns in human systems. The building block of what creates such flow is the tendency of human brains to seek out connection with one another, a phenomenon known to neuroscience as synchrony (Wheatley et al, 2012). This capacity to connect and "stick together", along with the sophistication of language, makes it possible for human beings to organize themselves into everything from families, sports teams, civic organizations, armies, global corporations, and nations. Through these connections people can create something much bigger and purposeful than the starting pieces alone. Prior to SAFT, a concept found in the literature was the "social organism" (Levine, 1995; Elwick, 2003; Christens, Strassman & Queller, 2009; Goodall, 2009). This useful construct brought attention to the tendency of human beings to act as a unified whole and in some ways like a single individual. SAFT goes further to describe flow effects within and among groups, and to explain common observations seen in organizations and societies. SAFT's explanation of these effects has value by bringing to conscious awareness the effects of various movements and leader types, as well as potential pathways for both organizational and societal improvements.

Further, SAFT is a systems-based model which can explain both the pursuit of isolated self-interest by actors within a social system, as well as providing insight into the potential for conflict among individuals or factions within a larger system. As to the first prediction, when participants within a system lack either the internal motivation to act in support of the system itself (i.e. a sense of commitment to the whole) or some external inducement to do so, the participants tend to act according to isolated self-interest, even when this is to the detriment of the larger system. The qualifier "isolated" to the term "self-interest" denotes when such actions lack regard for their impact upon the larger system or its participants. In zero-sum competitive scenarios, such actions may be sought because they impose especially adverse effects on other actors (think of many competitive sports, for example). The challenge that SAFT brings to light is that this often default arrangement of setting actors in competition against one another is done with minimal thought of the impact on the larger system, or at least it is a secondary concern. The more ruthless the competition, the more severe the consequences of loss and therefore the more existential the threat from competing actors, the less individual actors will be concerned with the well-being of the system and that of their fellow actors.

SAFT's other major prediction is that divisions between groups can harden over time to become cultural features both within groups and of the social landscape itself. The danger is internal fault lines are created where the decreased connection between members of different

Table

Summary of Research Methodology

Stage	Step	Summary
1. Planning the review	1. Develop research goals and objectives	Review both original articles on SAFT and then brief overviews of systems thinking and archetypes. Identify major themes and avenues of exploration. Identify a set of potential research questions.
	2. Explore archetypes under systems thinking and choose ones most relevant to SAFT's concepts	Two archetypes showed most relevance to SAFT's predictions of human behavior: tragedy of the commons and escalation
	3. Identify key search terms	"systems", "systems thinking", "systems theory", "Senge", "management", "policy", "archetype", "tragedy of the commons", "leader", and "escalation"
	4. Identify relevant databases	Academic Search Complete, Business Source Premier, EBSCO
	5. Determine inclusion criteria	Full text and peer reviewed articles Published in English Articles addressing societal and organizational concerns Earliest publications in late 1960s (practically, this was the beginnings of tragedy of commons, a central archetype)
2. Conducting the review	1. Perform multiple electronic searches of databases and review for duplicates	Three main searches were conducted along themes of systems thinking, and dual archetypes of tragedy of the commons and escalation. Reviewing hundreds of articles from each search, a cross-sectional sample of 27 core articles representing major social & organizational applications of systems thinking were selected.
	2. Review title and abstract based on inclusion/exclusion criteria	2 of the 26 core articles did not meet inclusion criteria
	3. Review full paper for inclusion/exclusion criteria	24 core papers remained
3. Reporting and dissemination	Report on the key findings and trends	

groups often translates into reduced empathy and concern for the fate of outsiders. This can be clearly dangerous to a society or an organization, especially if its survival requires it to act as a high-functioning whole. SAFT further predicts vulnerabilities for such a system with destructive dynamics between its constituent parts. Two initial vulnerabilities are (1) negative interactions between constituent groups can easily escalate into inter-group conflict and (2) a culture can set in among constituent members to ignore the well-being of the larger system of which they are a part, to the point that systemic threats will go unheeded. The third and culminating vulnerability for such a

system is (3) the larger system is in a weakened state such that systemic threats, going unheeded, may prove catastrophic.

Alternatively, SAFT also predicts that the psychosocial forces can be directed towards pro-social tendencies that lessen differences, attenuate intergroup conflict, give rise to greater cooperation, and foster the long-term well-being of sub-groups and the whole upon which they depend (Gourdine et al, 2019). SAFT postulates these outcomes require deliberate structures and behavioral reinforcements to foster an ethos of common well-being, and concern for the welfare of the whole.

RQ2: What are the major predictions of SAFT when describing behavioral flows within human systems?

As mentioned before, one prediction of SAFT is that in larger social systems, in the absence of unifying structures and inducements, the tendency is for larger systems to fragment increasingly over time into isolated sub-groups, ones pursuing their own self-interest. In the field of organizational management, the pursuit of self-interest in the absence of incentives to do otherwise is exemplified by the classic principal-agent problem. This is when individual executives or managers act in ways on behalf of the firm (agent-principal relationship) yet their actions are really serving their own financial gain or some other personal benefit. SAFT predicts this behavior, in the absence of systemic incentives to do otherwise, and this structural problem is investigated by scholars to this day (Bauer & Wirl, 2021; Ma & Wang, 2022).

It is also posited that in "free-for-all" environments, there is a perceived absence of justice in outcomes, the natural tendency is for individuals and groups to increasingly act in isolated self-interest since it aligns with self-preservation (Whitehouse et al, 2017). It can also be that among individuals (or companies within an industry) if there are no rules forbidding self-interested behaviors which provide competitive advantage over others, even if these behaviors have clearly undesirable externalities, these behaviors will be enacted. In business settings, SAFT predicts that companies will be driven to adopt these actions, externalities included, due to the pressures of competition. As noted by generations of scholars using Porter Five Forces Model for industry analysis (Porter, 1980; Siaw & Yu, 2004; Mihaela, 2021, as a small sample), rivalry among competitors exerts the greatest pressure upon firms. With industry competition exerting the greatest force upon behaviors between actors, they are compelled to seek relative advantage and react to disadvantage.

In a sociological context, SAFT predicts that over time this pattern becomes cultural; when new members enter such environments and join groups, they are taught this way of being and it then becomes an enforced cultural norm (i.e., continued group membership requires conformance with these behaviors). The other prediction of SAFT comes from research showing that humans have more empathy and moral consideration towards their closer associates than those with whom they do not associate (Shelton & McAdams, 1990; McDaniel, Grice & Eason, 2010; Masto, 2015; Gourdine et al, 2019). In social systems this means in groups where people associate with one another more closely and particularly when they share resources, the moral consideration towards one's own group will be higher. Alternatively, those with whom group members do not associate or those belonging to a group either antagonistic or in competition will predictably receive less consideration. Further, the more severe the conflict, the more the outer circumstances of the conflict become a rationale to justify actions lacking empathy and moral consideration. Viewing other groups as "lesser than" (i.e., dehumanizing) is another method to justify such actions. It is also predicted that an offense from a member of an outside group will be taken with greater offense than were the same action to be perpetrated by a member of one's own group.

The reason is that the offense by an outside actor is more likely to be interpreted or felt as an act against the whole sub-group. After all, the state of the social system is such that these sub-groupings (as opposed to allegiance to the whole) become part of one's identity and fulfill the need for belonging. The pain felt by such actions ripple across the sub-group as more threatening, acute, and personal. Therefore, offenses by outsiders take on extra significance. As an aside, these predictions clearly imply the dangers within a society marked by deep factionalism, whether factions are based on race, gender, ethnicity, sexual orientation, political views, or other means by which human beings segment themselves. To be clear, it is not the distinctions themselves that are the danger, it is the degree to which these distinctions affect moral consideration, the degree to which sub-groups see themselves in win-lose competition, or a sense of existential threat to group identity or well-being or fear of reduced status in the aftermath of a loss.

There is a dark side to social organisms predicted by SAFT and it is manifested in three dangers. One is the weaponization of populations to serve some short-term interest or ulterior motive of their leadership. We know from history that people can be rallied to undertake all manner of actions, both locally to commit acts against former neighbors (Rwanda tribal genocide: Buckley-Zistel, 2006; persecution of Bahais in Iran, etc.: Fassihi, 2022) and at the international level to follow charismatic leaders into ill-fated wars (20th century Germany under Hitler and Italy under Mussolini).

A second characteristic described by SAFT is more subtle and is often exploited by leaders like the ones above (Williams [2005] calls them "counterfeit leaders"). As previously mentioned, the perceived wrongness of an act (known as moral intensity) as well as our sense of empathy has been found to be positively correlated to the closeness of our connection to others (proximity). Likewise, these qualities of moral intensity and empathy decrease the less of a connection there is between individuals (Morris & McDonald, 1995). SAFT posits the danger becomes more acute when societies become deeply frag-

mented along ethnic, religious, racial, gender and other lines. This is especially true when these distinctions are believed to indicate differences in human worth, becoming caste-like divisions in human societies (Wilkerson, 2020). As we have seen from much of South African, Indian (Asian sub-continent), United States history and many others, an even more difficult situation occurs when such differences in value become closely held, and therefore enforced cultural norms. The injustice and the harm caused to fellow human beings can become a generational pattern.

Further still is a third danger predicted by SAFT when societies (and smaller aggregations like organizations) become deeply fragmented. When a member of another group does harm to one's own group, it is experienced even more intensely than if a member of one's own group were to commit the same transgression. This is the other side of moral intensity and the "otherization" that exists in many societies. Human identity and worth are especially tied to one's group when societies are deeply divided and there is a lack of trust (Fernando & Jackson, 2006). For members of an historically oppressed group, the offense is a painful reminder of unresolved injustice and acts like salt on open wounds. If the offending member is from a group of lower social rank, it is taken as a sign that the current social order is under threat (Wilkerson, 2020).

Returning to the role of counterfeit leaders, they capitalize on the divisions among people, tapping into their distrust and fear and leverage these extant psycho-social forces to move populations. In a negative cycle, SAFT predicts that populations may be manipulated into escalation of conflict to serve short-term needs of such leaders, usually centered on consolidating and/or exercising their personal power (Franz et al, 2019). The reality is the dangers and negative cycles just described are so common and pronounced they serve as historical reference points (i.e., various wars, ethnic massacres, etc.). SAFT also asserts the possibility of a positive cycle of creating greater connections between populations, though unfortunately there are far fewer examples of this phenomenon.

Literature Review on Systems Theory and Archetypes

RQ3: What is systems thinking and how does it inform decision making by managers and leaders?

Systems thinking and theory has been part of the management view of the organization for decades, with signal works such as Vickers (1965), Reed (1985), and Senge (1990 [Leaders New Work], 2006 [5th discipline]) part of its evolution. Systems thinking dispels the notion that the world can be treated as isolated phenomena and most problems solved by obvious actions. Decision-makers must be armed with deeper insights that can only come from a different perspective, one that is more informed as to the true nature of problems. This perspective must necessarily reflect the world's complexity, where many problems result from interacting sub-systems and processes, ones that often require more holistic thinking than the symptoms alone suggest. Various schools of thought have arisen within this field, from appreciative systems theory (Vickers, 1965; Checkland & Casar, 1986), general system theory (Dubrovsky, 2004), dynamical systems theory (Coleman et al, 2007), soft systems methodology (Avison & Wood-Harper, 1990; Checkland, 1994), and complex adaptive systems theory (Girod & Whittington, 2015). As Checkland (1995) observed nearly three decades ago, systems thinking gives managers the tools to address complexity by attaining a wider perspective: "More and more problems need to be examined in a global rather than a local context."

Further, the robustness of any framework can be correlated to how much it is referenced by practitioners and scholars (density of usage) and its longevity. As mentioned in the introduction of this paper, a search of just two popular databases with a basic search on "systems theory", with limiting parameters yielded 10,718 peer-reviewed articles dating from 1930. Though much more may be said of system theory/thinking because it is such a well-established framework, this overview will move on to examine its archetypes.

RQ4: What are the major archetypes described under systems thinking, what is their purpose, and their qualifying characteristics?

In the 1990 edition of the Fifth Discipline, Senge first introduced to the reader seven archetypes to accompany systems thinking, ones said to be indispensable to uncovering otherwise hidden patterns that can elude managers and decision-makers. As previously introduced, where systems theory better captures the complexity of reality, one where interrelationships between underlying processes present themselves, archetypes represent special cases of recurring patterns. The graphical depictions of Causal Loop Diagrams (CLDs) act like "off-the-shelf" templates that managers may use to describe problems confronting them. Acaroglu (2017) states that archetypes "rely on heuristics" which serve as sense-making shortcuts. Archetypes are used to help "identify feedbacks and occurrences in phenomena in the world." According to Kim (2000), archetypes use visual diagrams to communicate dynamic interrelationships within systems, some of which can only be surfaced by observation over time. For managers, altogether these capabilities stemming from archetypes set the stage for developing appropriate solutions.

Since Senge's 1990 publication, practitioners have cataloged several archetypes as well as articulating their qualifying characteristics. Depending on the source and how their names are distinguished, archetypes for practitioners vary in number from seven to 19 (Senge, 1990; Kim, 2000; Acaroglu, 2017). From these sources, fourteen of the main archetypes found are:

- Balancing process with delay
- Shifting the burden
- Eroding goals
- Escalation
- Tragedy of the commons
- Drifting goals

- Fixes that fail
- Fixes that fix back
- Limits to growth
- Growth and Underinvestment (very similar to "limits to growth")
- Growth paradox
- Limits to success
- Race to the bottom
- Rule breaking

Of course, it should not be thought that archetypes are the only tools that can assist decision-makers. Kim (2000) lists the following tool categories, which are broader than archetypes themselves: brainstorming, dynamic thinking, structural thinking, and computer-based tools.

RQ5: Which systems archetypes bear the closest relationship to SAFT, and might it best expand upon?

With the predictions of SAFT in mind, we embarked on a more targeted review of the archetypes. As stated before, there are seven to as many as 19 archetypes associated with systems thinking and the list above resolved into 14 that would be considered recurring. Though the researchers personally recognized about seven in the list and could have further limited the archetypes under review from 14, it was decided to be more inclusive to cast a wider net for this analysis. To identify which archetypes nearest the closest relationship to SAFT, each member of the research team independently chose archetypes that seemed to most aligned with SAFT in relationship. After this review, the lists were compared, and two archetypes were most aligned with SAFT: "Tragedy of the Commons" and "Escalation". For the former, SAFT's predictions of group fragmentation, and isolated self-interest clearly related to Tragedy of the Commons. On the other hand, the tendency to see and respond to actions by group outsiders in a more provocative light was reminiscent of the latter archetype, Escalation.

Given this focus, the next task was to survey the major ways the "commons" and "escalation" were used in the literature. Also, seeing the major ways they were applied would inform how SAFT might contribute to existing frameworks. In the published literature, judgment sampling was used to parse through the large volume of peer-reviewed, full-text (PDF) articles returned, even after narrowing the search to business, economic and management -oriented papers.

In the case of Tragedy of the Commons, it is classically framed in economic and ecological terms. For the economic case, individuals have the choice to use resources for their own benefit (such as fishermen using a common resource like fish they catch and sell from a nearby lake) or they may forego using as much of the resource with the interest of others who also depend on the same resource (Tornell & Velasco, 1992; Shultz & Holbrook, 1999; Hintze et al, 2020). The other frequent usage is in environmental sustainability, where "the commons" is again resources, but applies to openly available ones like clean water and air, a balanced ecology free of climate change effects, etc. (Brook, 2001; Ostrom, 2009; Batt, 2016). The choice of individuals and businesses is to limit the damage done to these "commons" so that others and later generations may use them as well. Also, an important common thread between both the economic and environmental cases is the individual must choose between an immediate, tangible benefit to themselves versus a more diffused, longer-term benefit to others. Interestingly, the two choices are often presented as mutually exclusive. We will revisit these points later when considering applying tragedy of the commons to new contexts.

In the literature, a surprisingly limited number of articles were found describing escalation in the context of systems thinking (just four: Friedman & Currall, 2003; Coleman et al, 2007; Girod & Whittington, 2015; Banson et al, 2018). And of these four, only two really delved into the archetype in a way relevant to this analysis; these were Friedman & Currall (2003) and Banson et al (2018). On the surface, the two articles describe settings that are completely unrelated. One is set in Ghana and discusses conflict in the pig farming industry (Banson et al, 2018). The setting of the other is white-collar office, communication by email and the tendency towards conflict. Despite the differences in settings, there were some fascinating commonalities and insights, which will be examined later (see section on Escalation analysis).

Expanding the Context of Tragedy of the Commons

SAFT's predictions of isolated self-interest taking precedence over the well-being of the whole aptly applies to the cases of economic and environmental concerns. But can tragedy of the commons be expanded to describe cases of intangible resources, such as culture, values, and concern for the "well-being" of the whole? For this analysis, we return to the literature.

In Bozicnik and Mulej (2010), the commons is not explicitly named but obliquely addressed. The authors identify corporate social responsibility, which comes from a stakeholder view of the firm connecting it to the outside world (local community, nation, society, etc.) and describe a holistic approach of being a good actor and steward (of "the commons"). In one sense of corporate social responsibility, the commons can be environmental, i.e., the global biosphere and the clear dependence of humankind on this open resource. In addition to the environment, corporate social responsibility equally implies positive stewardship towards people and organizations outside the firm and conformance with societal expectations. In a related context, Santos and Pacheco (2011) modeled a social goods game of cooperation, with applicability to major social and societal issues (global warming, etc.). These two sets of scholars therefore connect corporate social responsibility and cooperation to the well-being of the commons. Batt (2016) identified the commons as any resource of value to the common good, even cultural ones. It is important to note that culture consists of values, beliefs as well as observable behaviors (Cleary-Holdforth

et al, 2022; Omoregbe et al, 2022; Irimias & Pop, 2022). Thus, there is a consideration of an intangible resource, like culture, to be considered "the commons".

The above proposition is partly confirmed by Maaravi et al (2021, p. 2) whose study of compliance with COVID measures across various nations found that in more collectivist cultures and where individuals had a more collectivist outlook (i.e., the well-being of society at large is valued), citizens tended to be more compliant with measures for public safety. Alternatively, they also found people were less compliant with protocols for public safety in more individualistic cultures and among individuals who personally valued their individual freedom above the well-being of the whole. In the latter case, these individuals see actions of personal freedom as near, specific, tangible, and more valuable than the more abstract concept of preventing infections among unknown strangers. In this case, the commons are represented by the well-being of society at large (Maaravi et al, 2021).

Expanding the contexts in which tragedy of the commons can be applied requires reframing the archetype from a focus only on resources to connecting the archetype with the nature of the choices it involves. The four traits by which the choice can be evaluated are (1) the proximity of benefits, (2) immediacy of benefits, (3) the concentration of the benefits, and (4) mutual exclusivity of the choices in each situation. It can be conceptualized that benefits accruing to "the commons" (i.e., the group or larger system) are seen as long-term, broadly dispersed, farther away, more abstract, and general in nature while individual self-interest favors choices with benefits that are immediate /short-term, concentrated, at-hand ("right here"), specific, and more tangible (i.e., the classic "bird in hand" versus "two in the bush"). As to the last trait, it is not that all choices must be mutually exclusive (we may seek ways of arranging otherwise), but more specifically zero-sum choices tilt human choice towards a loss of the commons. Particularly when considering systemic incentives which avert tragedy of the commons, future work on the topic should include the work of Ostrom (2009).

At this juncture, some caution as to the limits of terminology needs to be asserted. Specifically, we need to acknowledge the phrase "individual self-interest" can take on a wider range of motivations than our common usage of the term. The hidden assumption in our language is that individual "self-interest" describes largely materialistic values where one seeks greater money, power, status, prestige, individual well-being or even self-preservation, as default choices and where concepts like integrity, ethics, morality, altruism, and concern for the general welfare, do not exist as preferred motivations for actions. There are many instances where individuals act outside of "self-interest", but this is only because we have a limited use of the term. Self-interest is really defined by what the individual subjectively happens to value in a set of circumstances. To an altruistic person, she/he gains something very valuable in actions that appear contrary to the commonly accepted set of behaviors in the phrase "self-interest".

Nevertheless, the commons can alternatively be seen as a taken-for-granted resource or cultural value that is used or sacrificed (in terms of values) in the pursuit of individual (or company) self-interest. In essence, the individual may place a higher value on acting to maintain a personal (or company) ethos and foregoing some nearer, tangible benefit. If we combine the two, ethics is a long-term, loftier, and more abstract concept aligned with notions like "character" that competes often with behaviors aligned with tangible, specific, short-term benefits aligned with self-interest. The opportunity cost of making more holistic and long-term decisions is forgoing strictly individual (or company) self-interests and on the other hand, the cost of making strictly self-interested choices is forgoing the long -term benefits to the whole system and its stakeholders (as well as potentially a nobler character for individuals or concepts like corporate social responsibility for organizations).

Returning to the former point, if the lens of tragedy of the commons is widened beyond material resources to include a loss of values like "concern for the greater good", altruism, collective well-being, etc., a new social framework enabling new analyses and insights emerges. The contribution of SAFT is in understanding the destructive effects in systems of intergroup rivalry, prejudices, winner-take-all power grabs, factionalism, intense competition for resources, etc. (also called forces of disintegration) versus prosocial tendencies such as intergroup cooperation, reciprocity, mutual assistance, alliances for mutual benefit, etc. (also called forces of integration).

At a high level, this was the dynamic that played out in World War II: the world witnessed self-interested, national actors attempting to forcibly seize new resources outside their borders using domination and tactics of physical aggression, but in the end failing to do so. In the aftermath of that failure, a new order arose. Unlike the power grabs at the heart of WWII, the benefits of the new order were gained over the long-term, and not through acts of violence, but through trade agreements designed to confer long-term mutual gain. Unlike the brutality and bloodshed at Normandy, more was ultimately accomplished to enrich all parties, Axis powers included, through the economic order created at Bretton Woods in 1944 (Ziehan, 2014). One might also conclude that the formation of the United Nations in October 1945 was a similar outgrowth of the recognition that global, collective well-being was a cause worthy of protection. A super-national structure was needed to help administer affairs between nations. However, it was only within the crucible of an extremely costly and destructive war was the need recognized.

Further, where SAFT describes the tendency of groups, individuals and firms to turn their concern inward to themselves and to forego supporting the larger system (i.e. for individual self-preservation, because of systemic conditions antagonistic or simply indifferent to their well-being, etc.), we see a complementary relationship between

the tragedy archetype and SAFT. Where SAFT predicts groups (and firms) will, under certain circumstances, increasingly make choices for self-preservation, this same withdrawal of support for the larger system is the abandonment of "the commons". This abandonment necessarily precedes the later stage of tragedy of the commons, simply the outcome of systemic and long-term neglect, overuse and/or abuse of the commons. We can also surmise the outcomes in systems where (1) competition is intense among groups for resources, (2) there is no cushioning by the system for individual losses, and (3) these are combined with weak structures and/or insufficient incentives to preserve a healthy commons. One can only expect that individuals, groups and firms will engage in intense competition and leave "the commons" vulnerable to depletion. The system sets up the actors in all-out-competition at the commons expense. Under this framework, we may then redefine the tragedy of the commons as the outcome of incomplete systems engineering and design.

Analysis of Escalation

As mentioned previously, Friedman & Currall (2003) and Banson et al (2018) were of particular relevance. On the surface, the two articles describe settings that are completely unrelated. One is set in the Ghanaian pig farming industry (Banson et al, 2018) while the other is in a white-collar office dealing with email communication tendencies. Both articles can be explained using SAFT and this hinges on the role of psycho-social phenomena (thoughts, perceptions, culture, values, beliefs, etc.). We see a link between the two in comparing the psycho-social dynamics at work in the settings.

In the case of Banson et al (2018), they outline the work of consultants to farmers, government officials and business owners in Ghana, with tensions existing between the parties and the presence of competition: "Escalation dynamics is erupting in the agriculture industry of Ghana leading to rivalry. Delay in information access by new entrepreneurs into the piggery industry contributes to distortions flowing between the new and existing parties. Once delay occurs, information gets distorted along every link of the system, which leads to overestimation of the impact of its rival's activities" (Banson et al, 2018).

In the above situation, individuals communicating with other parties were in a setting of competing interests. "Delay in information access" between the parties creates a chain reaction of distorted perceptions in "every link in the system" and an "overestimation…of rival activities" (Banson et al, 2018). Individuals, in the absence of real-time information and connection to the full context of the actions and intent of other participants, have a perceptual bias of presumed hostile intent. Therefore, they tend to distort the intentions of others and this presumption then appears to become systemic. In such an environment, it is no wonder that conflicts arise, remain in place (if not escalating) and holistic solutions seem unattainable without special outside intervention. Banson et al (2018) documents the work of outside consultants in Ghana, the significant thought and energy needed to unlock a group's dynamics, and to create the space for more holistic solutions to emerge. If perceptual biases towards mutually held, negative assumptions are a common human tendency for groups, this might explain why groups frequently require trained outsiders to help them understand and unlock their problems. As a sign of our need for outsider intervention in the U.S. alone, in 2022 management consulting was a $329 billion industry (Ibisworld.com).

In the case of Friedman and Currall (2003), they base their work on prior scholars (Clark & Brennan, 1991) who coined the term "grounding". Grounding in communications creates a shared sense of understanding and allows more empathetic connections, which appear to decrease the likelihood of conflict and escalation. Valuably, they cite prior research:

"Clark and Brennan (1991) argue, there are six tools for grounding: (i) co-presence, which allows each party to be in the same surroundings and see what the other is doing and looking at; (ii) visibility, which allows each party to see the other (albeit not necessarily their surroundings); (iii) audibility, which allows each party to hear timing of speech and intonation; (iv) co-temporality, where each party receives an utterance just as it is produced; (v) simultaneity, where both parties can send and receive messages at once; and (vi) sequentiality, where turn-taking cannot get out of sequence…[importantly] none of the above features are available in e-mail communications" Friedman & Currall (2003).

Given the lack of grounding in e-mail communications, it is not surprising the authors found this medium associated with a higher tendency towards conflict and escalation. Beyond the context of e-mail, we note that in the Ghanaian case study, the participants' communication also lacked many of the elements of grounding. Without connection to "the other", it seems the tendency is to interpret communication and actions based on individual and group internal dialogue. It appears to be an evolutionary holdover that biases us towards self-preservation, absent contextual evidence to the contrary: we seem watchful of threat and danger in the words, actions, and intentions of others (Milner et al, 1991).

From the escalation literature, we see the role of psycho -social factors driving individual behaviors, ones that can affect the state of the whole system. Reflecting on the system, the analysis now pivots to SAFT as it describes behavioral flows for both individuals and groups. SAFT predicts groups will respond more harshly to the same offense perpetrated by an outsider, and this notion sets a stage where escalation becomes a real possibility. Another finding within the literature leading to SAFT is the effects on pro-social feelings like empathy and moral consideration the more distant (or closer) individuals feel to others. It is not surprising then that in the literature on escalation, it explains how in the absence of grounding in human communication, there is a greater tendency for conflict to increase among individuals and groups.

If one takes a cue from paleoanthropology, it is easy to

imagine environments of 100,000 years ago where congenial meetings with strange groups were not the norm and in fact just the opposite may well have been likely. Homo-sapiens and closely related human species have for hundreds of thousands of years (if not a few million) encountered groups of other humans in environments of resource scarcity, frequent tribal warfare, intense competition for food and shelter, and even occasional cannibalism (Saladie et al, 2012; Saladie & Rodriguez, 2017). To the last point, evidence suggests some early humans may have had predatory relationships with weaker groups, even consuming selected members and their children like patterns observed today among competing troops of chimpanzees (Saladie et al, 2012). Even if we want to discount the distant past, the past several thousand years of history are marked by frequent skirmishes and wars between villages, kingdoms, and empires, the main differences only being geography and the level of organization. We seem hard wired to be suspicious of others and easily assume the worst because that is likely the norm of much of our evolutionary and recorded history. Therefore, one takeaway for modern times is intergroup trust and cooperation are not to be taken for granted. If these are desired within current systems, we likely need to "work at it." Experience clearly implies this outcome needs to be actively fostered, built into the system's relationships, and reinforced.

Further, the idea of the "social organism" is one of the concepts examined during the development of SAFT. The social organism is composed of individuals and groups acting as one, brought together by shared elements of their psycho-social reality (Levine, 1995; Elwick, 2003; Christens, Hanlin & Speer, 2007; Strassman & Queller, 2009; Goodall, 2009). SAFT and the social organism can help us better understand escalation. Specifically, how a shared psycho-social reality of the "alien other" and hostility sets the stage for conflict and escalation, not just for individuals but for groups as well. This is particularly understandable when there are extant factors of intense rivalry, prejudices, ill-feeling, competition for limited resources, or a history of conflict, that all together or separately may create a sense of existential uncertainty and elicit behaviors associated with threat, whether for individuals or groups.

It is also important to note that human beings possess the ability to cooperate to achieve better group outcomes and a duty exists here to highlight this potential. In the development of SAFT, the phenomenon of synchrony was found in the literature. As a reminder, this neurological phenomenon in the human brain contributes to our ability to form groups (the tendency of human brains to seek out and synchronize with other brains (Wheatley, Kang, Parkinson & Looser, 2012). In the presence of the right type of communication, this inherent tendency enables our ability to collaborate, and for groups to problem solve together. This positive potential was the basis for a revision to the commonly held assumption within tragedy of the commons by Ostrom (2009).

Ostrom (2009) documented that in ecological cases, empirical evidence showed that destruction of the commons was not a foregone conclusion. Prior studies showed that under certain conditions, groups are capable of self-organizing to preserve the commons, even though individual actors separately derive benefits from the commons. Importantly, among the various factors she identified leading to intergroup cooperation are (1) sharing of information between parties and (2) intergroup norms/ social capital. Ostrom's (2009) findings give rise to another insight: if the preservation of the commons and prevention of escalation are desirable outcomes for a system, then the factors that contribute to these outcomes may be considered part of the system's resources. This is especially true if these resources can be either fortified/ increased or weakened/depleted by the system's actors. Also, if the system's actors either benefit or suffer somehow according to its supply, then such factors equally qualify as "the commons" as do stocks of fish, clean water, or other factors.

Though Ostrom's work does show the impact of communication among system participants on the commons, she also lists an important factor of "social capital". Briefly, social capital relates to positive, intangible, prosocial sentiments like trust, reciprocity, sense of community, common cause, etc. that characterize the relationships among a group of people and are aspects of culture (Carson et al, 2022; Ozgun et al, 2022; Firouzbakt et al, 2022). The literature suggests these features of human relationships can also have an ameliorating effect on both escalation and tragedy of the commons (Friedman & Currall, 2003; Ostrom, 2009). Though further analysis is needed (as stated later under Recommendations for Future Research), social capital is arguably a desirable resource among a population and therefore can itself be a form of the commons. Similarly, the absence of grounded communication was a factor not only in the loss of cooperation, but in the escalation of conflict in email communication (Friedman & Currall, 2003; Clark & Brennan, 1991).

RQ6: Considering the behavioral patterns described by SAFT and comparing it to existing archetypes, what is SAFT's place relative to the archetypes of systems thinking?

Building on Constructal law, SAFT describes flow patterns within human organizations as they occur due to psycho-social factors. The influence of psycho-social factors upon human volition (will) is the key distinction between human flow patterns versus those flows within inanimate media (i.e., water, air, electricity, etc., which are described by Constructal law). At this conceptual level the relationship of SAFT to the archetypes can best be understood.

The first realization is that all systems archetypes represent recurring flow patterns in human organizations and social systems, patterns reflecting the prevailing psychosocial factors at work combined with human choices. Among the psycho-social factors are individual perception, decision-making biases, preferences, and organizational culture. These factors, when combined with deci-

sion-making power and when recurring across different contexts, become known as archetypes. Therefore, SAFT is the broader and generalized descriptor and predictor of aggregate behavior where the archetypes are specific flow patterns seen time and again. In short, SAFT is the general theory, the archetypes are the tools. For example, the tragedy of the commons, just as SAFT predicts, describes a flow pattern where the system is damaged by actors pursuing their own isolated self-interests, but implicit in its definition the tragedy archetype only describes the negative outcome. Tools are useful, but they are limited to specific applications. This tool only shows one side of the coin. The theory, SAFT, tells us there is also another side, one formed by positive interactions. Specifically, SAFT predicts constructive, positive outcomes for the system through prosocial behaviors, that a positive cycle from the aggregate of human behaviors is also latent within the same system. This was in part the independent finding of Ostrom (2009).

Nevertheless, archetypes themselves are quite useful. Archetypes allow participants to "zoom out" and gain objectivity of their context. The causal loop diagrams of the archetypes help a system's participants step outside the context of individual perceptions, biases, and their organization's culture to identify the larger flow patterns at work. In the current predictions for SAFT (both in this paper and Gourdine et al, 2019), the escalation and tragedy of the commons archetypes are the two most directly related archetypes. Though other archetypes may also be eventually explained via SAFT, tragedy of the commons and escalation have several implications that warrant priority for further exploration.

Conclusions

SAFT is a systems-based, generalized contribution which both deepens and broadens the understanding of the tragedy of the commons and escalation archetypes of systems theory. The dynamics of SAFT explain the behaviors of individuals, groups, and firms in both sociological and competitive business contexts. The pursuit of isolated self-interests by these actors, under conditions where the well-being of the whole is not protected, leads to depletion of system resources over time by participants. This situation describes the tragedy of the commons. The literature for tragedy of the commons also shows this construct can be expanded beyond the fields of economics and ecology to be applied to attributes associated with social structures such as culture, trust, mutual concern for collective well-being, and social capital. Further, these intangible resources can be eroded over time and taken for granted by system participants, similarly to natural resources in the classical sense of the commons. The specific phenomenon of social capital will be discussed in the recommendations section.

The pattern of escalation is also predicted by SAFT. The theory predicts that when hostility and/or antagonism exists among actors within a system already experiencing alienation or estrangement, there is a tendency for this to escalate into conflict (note also the absence of social capital in this situation). The literature for escalation also shows that grounded communication is important and the lack of it contributes to escalation.

It is also noted that elements of grounded communication, ones which foster connection between participants, also can be seen in the factors by Ostrom (2009) which help prevent tragedy of the commons. SAFT predicts that human social systems can experience trends of increasingly negative or positive (prosocial) behaviors among system participants. SAFT predicts that while many negative dynamics occur unconsciously, it also predicts that desirable, prosocial behaviors can equally be fostered and nurtured within human systems as deliberate matters of choice and design. In support, the work of Ostrom (2009) found that the tragedy of the commons is not a foregone conclusion and suggests that desirable outcomes for the commons can be designed and structured into systems. We may also surmise that just as was found with tragedy of the common, the escalation archetype simply describes a dynamic within social systems, but itself is not a foregone conclusion.

Recommendations for Future Research

Given the impact of the practice of management in virtually all spheres of human activity (business, non-profits, government, educational institutions, healthcare, law enforcement, etc.), the impact of SAFT and the two archetypes above on this field should be examined first. Preliminary review shows an interesting line of investigation into the phenomenon of an expanded "commons". For example, the commons may be defined by any number of positive organizational and/or sociological outcomes, like social capital. A preliminary search shows some prior research into social capital within both organizational and societal contexts has been done (Szendro, 2021; Ozgun et al, 2022). In this context, a literature review might investigate which organizational characteristics, especially social capital, are related to this broader view of the commons. Subject to any substantive findings from this research, a follow-on question is ascertaining if there is any relationship between leadership attributes and those organizational commons (such as social capital, trust between members, organizational citizenship behaviors, etc.). One might suppose that prosocial tendencies among leadership would be consistent with a prosocial culture, but this would need to be investigated in the literature.

Along these same lines, a natural question arises when considering the various types of leadership that have been typically taught in business schools. If the prior examinations substantiate the idea of the organizational commons being affected by leaders' behaviors, and there are desirable outcomes associated with the commons, would an inventory of those behaviors promote one type of leadership over others? Similarly, if the organization's commons partly depend upon the quality of an organization's relationships, then do leaders with higher emotional quotient scores (EI) presumably have a better effect on the commons of an organization? With the significance this current paper attributes to the connections between people

(to factors like grounded communications, moral consideration, empathy, etc.), one would also think that the "science of relationships" (with related concepts like emotional intelligence) may be reinforced as even more important going forward, just as much as our emphasis on the "science of things" like artificial intelligence and analytics.

Further, in the wake of decades of highly publicized scandals, ethics and leadership has been a societal and accreditor expectation of business schools' curricula (Chedrawi et al, 2019; Ramboarisata & Gendron, 2019). The literature for SAFT suggests a correlation between proximity of relationships and the moral intensity felt in actions affecting others. A key question then arises if the ethical (and often more empathetic) behavior society wants from business leaders requires greater connection between them and stakeholders. A literature review of business ethics and ethics education should investigate prior scholars' identification of the importance of relationships/connections between strategic leaders to various stakeholders. Given SAFT's assertion that factors like moral consideration/intensity tend to vary according to proximity between parties, it would be relevant to know to what extent this is mentioned in current ethics education. A companion case study of several ethical scandals in business and ascertain if the quality of relationships and proximity between parties appeared to have been a factor. As a hypothetical example, when the owner of a local power plant or mining operation has direct relationships with school officials and residents in the community, one would imagine they would be less likely to dump toxins in the water supply affecting the community's children.

A fraught relationship sometimes exists between law enforcement and communities of color in the United States. The intersection of local policing practices, engrained culture among some departments and the prevalence of mobile phone technology have brought to the forefront cases of misconduct. On the surface, a solution consistent with SAFT appears to already exist and it is called community policing (Johnson, 2018). In short, it is a model that includes the traditional, core work of law enforcement, but it is conducted in the context of trust-building and relationship-maintaining actions within the community. These relationships are fostered through proactive police interaction with community faith groups, schools, agencies, community leaders and residents (Johnson, 2018). In the words of SAFT, it is "policing with connection" and as an extension of the communities being served. It is policing as an extension of the community and from its statements, appears to walk this talk. Just as a biological cell has components upon which it depends for its healthy functioning, communities need their police and rely on them for essential services. Considering SAFT and its emphasis on relationships, a literature review of community policing should be conducted to include the role that relationships and attributes like social capital play. With debate about the effectiveness of practices such as racial profiling, one inquiry would be if these practices are acceptable under a relationship-based model such as community policing. SAFT would suggest, considering the empathy differentials predicted to exist in an ethnically divided society, that profiling would be a practice imposed on a community and antithetical to a model of having relationships and connections to it. Part of the same study would be a comparative review of documented cases of police misconduct as well as those communities using community policing to see what role the presence (or absence) of community relationships may have played.

Another avenue is the area of adaptive leadership and the concept of the holding environment. The holding environment is a space in either a one-on-one relationship, an organization or a community that is the glue that "keeps people in the room" when there is inevitable tension associated with change (Heifetz, 1994; Heifetz & Linsky, 2002). It is formed by a sense of trust, common cause, and commitment to the vision of the larger group as well as faith in the leader of change. In other words, the holding environment of an organization is closely related to the organization's social capital, which is argued here as a form of its commons. It logically follows that this environment should be affected, positively or negatively, by a leader's behaviors. One research question would delve into the concept of the holding environment and its connection to the organization's commons. This line of inquiry under adaptive leadership naturally could be built upon the investigation above of organizational culture and the commons.

A final area for future study and possible contribution to the field of adaptive leadership is exploring counterfeit leadership as defined by Williams (2005). Given the understanding of SAFT, we may have yet another way to define the process whereby charismatic leaders steer organizations, political movements, and even whole nations more clearly. Beyond understanding the process, it may be possible to compare various historical examples of such leaders and determine if an evaluative framework emerges from commonalities across time and geography. Not only will such a study have at its disposal the lens of SAFT, but also various archetypes may be considered for descriptive fit. Given the impact of modern warfare on whole populations in places like Syria and more recently Ukraine, we may need to take more seriously the impact of leadership on the global commons and the need for warning signs. As asserted almost 60 years ago by scholars such as Vickers (1965), the interconnectivity of the modern world makes both systems thinking and understanding social dynamics even more relevant today than ever before.

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