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**Title:** Negative outcomes of individual spatial distance reductions in urban environments: A theoretical analysis of entropic organizational citizenship behavior and toxic organizations in urban deconstruction.

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**Abstract**

The fact that individuals are spatially close to each other in the urban environment increases the potential number of encounters between them. Thus, theoretically speaking, the probability of interaction and social intercourse among people increases as they get closer to each other spatially. This reduction in spatial distance and propensity for larger networks can offer advantages in lower communication and transaction costs. However, there is also the possibility of entropy in a single (organizational) urban subsystem, characterized by reduced spatial distances between individuals that can lead to more toxic outcomes and the possibility of generalized deconstruction in an urban system as a whole. The current paper considers, through a theoretical model and secondary data analysis, how reductions in spatial distance between individuals in urban business organizations can lead to withdrawals of energy through toxic forms of entropic citizenship behavior, and lead to the development of toxic organizations. Such toxic organizations can 'infect' the urban system and lead to systematic entropic urban deconstruction. Practical, implications for management of the theoretical explanatory heuristic of toxic forms of organizational entropy and toxic organizations are briefly discussed in the paper.

## Introduction

With regard to the use of the concept of entropy in the social sciences, Bailey [1], suggests that. "order is not a constant value but a matter of degree. Order can vary from a low of zero (randomness or maximum entropy) to a high of perfect predictability (maximum departure from randomness or minimum entropy)". Coldwell [2}, discusses the concept of organizational citizenship entropy using Theil's [3], description of the entropy which regards it as the proportion of the maximum possible dispersion in which a variable is spread among categories or spatial units with 1 being an evenly spread variable among all categories, and 0 if the variable is concentrated in a small number of categories. Formally, this idea can be expressed by:

$Hn=\sum n\ 1\ p\ 1 \log (1/p\ 1\ ) \log n$ Hn=∑1np1log(1/p1)log n., Where *Hn* is the extent of entropy, and $p(x_1)$ is the probability of variable *x* being found in each $n$=1,…, *n* zones, classes or categories.

In the current paper maximum organizational instability is regarded as occurring when Organizational Citizenship Behaviour (OCB) deconstructs into Organizational Citizenship Entropy Behaviour (OCE) with the latter being characterized by low orderliness and minimum predictability in behaviour. The disorder created by extreme personal and organizational supportive behaviour is inimical to effective organizational outcomes and goal attainment and thus, ultimately, its survival. Excessive (toxic) supportive (helping) behaviour concentrated among specific personnel categories can derail organizational functioning by its disorderly fragmentation and retraction of work behaviour from focused performance and formal goal attainment. On the other hand, excessive (toxic) formal organizationally oriented

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behaviour (i.e., going to extremes to attain formal organizational performance goals) can lead, through mechanisms such as employee burnout, to the complete derailment of formal goal attainment through a spread of disorder created by the toxicity of extreme work behaviour among employees that ultimately becomes inimical to the survival of the organization concerned.

In a similar individual interaction level micro, bottom-up analysis Ribeiro et al [4], indicate that, "When humanity built the first cities, they brought individuals previously separated by space, increasing social and economic interactions, through the shared infrastructure of the cities, in a more constant and efficient way. Since then, the city as a social organization of humanity has become an important place to create interactions in space and time between individuals". In this regard Bettencourt and Lobo [5] have proposed an explanation of the effect of city inhabitation in terms of its network effects. The fact that individuals are spatially close to each other in the urban environment increases the potential number of encounters between them. Thus, theoretically speaking, it creates the probability that interaction and social intercourse among people increases as they get closer to each other spatially. This reduction in spatial distance and propensity for larger networks in many instances offers advantages in lower communication and transaction costs.

Although, Ribeiro et al [4] point out that: "We are not modelling the mechanisms behind how an individual may influence others. We are just considering that the influence strength decays over the social network through distance in a pairwise interaction at the micro level", they clearly state in their model that the influence of reductions in space between individuals afforded by city living increases interactions that generate *specific overall benefits*. The current paper, maintains that such spatial reductions that occur under specific toxic interactive individual employee conditions, can lead to entropy and specific negative organizational outcomes which can spread to the urban system as a whole. For example, Fistola [6] has shown the propensity of a single urban subsystem's entropy in generating entropy in other urban subsystems and, through a process of deconstruction in entropic clusters which systematically remove energy necessary for their survival, ultimately undermine the survival of urban systems as a whole. Organizational and urban deconstruction is defined in the current paper as a dismantling or *chaotic decomposition* of the organization as a subsystem and not as a method of literary analysis. [7].

The model suggested by Coldwell [2] points to a specific type of interaction, that of extreme organizational citizenship behavior, that can be seen in toxic employee citizenship-type behavior (i.e. behavior that goes the extra *unwanted* mile), that can lead to team deconstruction and ultimately undermine organizational survival. Following Fistola [6], such entropic deconstruction in one subsystem can undermine other urban subsystems. The paper, however, focuses on the single organizational aspects of entropic citizenship behaviour arising from toxic employee behaviour and although outlined in broad terms from available secondary data a detailed analysis of this spread to other urban subsystems is considered beyond the scope of the current paper.

The paper takes the following form. The next section gives a brief outline of the methods used, which is followed by a brief outline of the origins of the entropy concept in science, social science and organizational science, with a brief discussion of the concept of Organizational Citizenship Entropy and how it is used in the current paper. The model of Organizational Citizenship Entropy (OCE) is then outlined. This is followed by a discussion of OCE relationship with the problem of toxic employees in organizational deconstruction.

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The paper ends with a conclusion that outlines limitations, practical implications and possibilities for further research.

## 2. Methods

The paper adopts a secondary data analysis of extant literature to build and consider the practical utility of an organizational citizenship model in explaining toxic forms of employee behavior that can lead to toxic organizations and generalized urban entropy. This methodology is, "In the broadest sense, (an) analysis of data collected by someone else". [8]. In other words, an analysis of secondary data involves the use of secondary data obtained from existing sources of data and, "secondary data can include any data that are examined to answer a research question other than the question(s) for which the data were initially collected" [9].This methodological approach is distinct from primary data analysis which involves the individual(s) who designed the research, collected the data and performed analyses.

## 3. Literature review

The following sections very briefly outline the origins of entropy with particular reference to the concept's use in the social sciences and in in particular the general field of organizational economics. In the physical sciences the term 'entropy', derived from the Greek en+tropein meaning "transformation content", is considered by Clausius [10], as that fraction of energy contained in a system unavailable to produce work; and that in any system, this unavailable energy tends to increase. Entropy is usually defined in closed systems in which energy cannot be added or removed, Although the total amount of energy that becomes disordered in a given system and which thus becomes unavailable, increases, it does not stop order somewhere else in the same system from increasing [11]. Boltzmann [12], utilized the concept of Entropy in statistical mechanics. Boltzmann's [12] entropy is defined as: S = K in W. Where K is the Boltzmann constant unit of measurement of entropy, W is the thermodynamic probability (statistical weight) and incorporates the total number of microscopic states compatible with the macroscopic state of the system. W is the degree of disorder or amount of disorder in the system and S is Entropy which is a positive increasing function of disorder (W).

Theil [3], conceptualizes entropy as a measure of dividedness and dispersion in the development of his "evenness of spread" entropy concept. Theil's [3], notion of entropy is regarded as providing the conceptual base for the development of a formal model of organizational citizenship entropy outlined in the current paper in relation the delineation of a toxic organizational heuristic built from specific negative OCE processes arising from spatial reductions in individual interactions afforded by urban environments [4] which can infect other organizations and lead to more general urban entropic deconstruction [6.]. Landsberg [13], proposes a simple order/disorder entropy theory based on thermodynamics and information theory which defines entropy (total disorder) in a system that arises when a system's capacity for disorder is 'overwhelmed' by its capacity for absorbing further information.

The social sciences have adopted the concept of entropy in a number of disciplines. For example, in the disciplinary field of sociology, Bailey [1], maintains that "order is not a constant value but a matter of degree. Order can vary from zero (randomness or maximum entropy) to a high of perfect predictability (maximum departure from randomness or minimum entropy)". In zero order (maximum entropy) social systems, there will be

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maximum energy wastages. On the other hand, in social systems with minimum departures from randomness, there will be minimum energy wastages.
This notion of energy wastages in social systems is a common theme in various disciplines in the social sciences.
Gunn [14] defines business thermodynamics as the transformation of energy in a productive system which he regards as constituting the core energy derived from human motivation. Corporate entropy is regarded as the portion of a system's energy that is unable to be transformed into a productive and functional system, which is thus irreversibly lost to that system. For example, Ackoff [15], regards corporate entropy as being reduced through the elimination of wastage of corporate energy. If, for example, an executive manager uses unutilised board meeting time to motivate subordinates to increase their work outputs, he will have reduced time wastage and corporate entropy.
DeMarco and Lister [16] define corporate entropy as "levelness or sameness" and the more sameness increases, the less the potential to create energy to do work. Uniformity in attitudes and thought processes in a corporation is seen as entropy because this has a tendency to smother productive energy at work. They maintain that entropy in organizations is brought about by the inevitable increase in staleness and stasis one finds in older corporations with tightly structured bureaucracies.
Williams [17] defines organizational entropy as the *disorder* in which work functions are organized and performed. For example, person A is working on project Y and needs person B's skills. However, person B is working on project X at that time so project Y is held up. In a large organization with many projects being processed simultaneously, such disorder in energy utilization leads to energy wastage and entropy. Entropy arising from this source could be counteracted by a more thorough critical path analysis of given resources and project requirements. Clearly, social scientific organizational adaptations of entropy adopt a common underlying dimension of energy wastages arising from the unevenness and disorder in social systems. This idea is developed further with the concept of OCB in the next section.

*The concept of organizational citizenship entropy*

Organizational Citizenship Behaviour (OCB) is defined by Organ [18] as: "individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system". OCB is further defined by Organ [18], as, "contributions to the maintenance and enhancement of the social and psychological context that supports task performance (or the technical/technological/production system)". Organ's [18], definition of OCB as a phenomenon that extends beyond individual to group level has multiple implications for the importance of OCB in organizational deconstruction. Two major aspects of Organ's [18] definition of OCB emerge the; conception of "individual" "conscientiousness" and the conception of "group morale". From this it seems reasonable to suggest, although not specifically voiced by Organ [18], that *group morale* arises largely from the collective impetus of *individual conscientiousness* joining together, and is a major aspect of OCB.
At the individual level of analysis, OCB is typically regarded as a multifaceted phenomenon, incorporating traits of altruism, compliance, sportsmanship, courtesy, and civic virtue. However, in general terms, OCB can be regarded as consisting of a dichotomy made up of organizational and personal support dimensions [19].
Findings of OCB empirical studies [20, 21], suggest that *balance* between personal and organizational goals in organizational citizenship is necessary for good organizational performance and that extremes of either a personal or organizational orientation may increase the propensity for organizational deconstruction. From the theoretical point of view, it is maintained in in line with Coldwell [2], that increasing amounts of either personally or

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organizationally oriented OCB which is distributed unequally amongst categories of organizational personnel will result in increases in in organizational deconstruction

In the original model proposed by Coldwell and Callaghan [22], it was suggested that, at very high levels of personally oriented citizenship behaviour and very low levels of organizationally oriented citizenship behaviour ECB will occur. However, the heuristic is unable to articulate formally the distribution of personal and organizational citizenship behaviour that leads to ECB. this aspect was taken up by Coldwell [2], in his model which is utilised in the current paper. In Coldwell's [2], paper Theil's [3], "evenness of spread" concept is used to provide a sounder, more formal and detailed development of the original Coldwell and Callaghan [22] model. Theil's [3], conceptualization of entropy focuses on "evenness of spread"

Theil's [3], concept focuses on the proportion of the maximum possible dispersion in which a variable is spread among categories or spatial units. This is regarded as 1, if the variable is evenly spread among all categories and 0 if the variable is concentrated in a small number of categories. The term "categories" in the current paper, refers to an organization's divisional and departmental personnel. When either personal or organizational oriented citizenship behaviour is concentrated among personnel or particular individuals who can have a pervasive effect on other team members), in particular departments and not distributed evenly among such personnel that make up the organization as a whole, as in the case of toxic employees, those departments tend towards entropy.

Iceland's (2004) approach to spatial racial segregation in which the entropy index varies between 0, when all areas have the same composition (i.e., maximum integration), to a high of 1, when all areas contain one group only (maximum segregation), is derived directly from Theil's notion of unevenness and is particularly relevant here, requires a brief further explanation.

According to Iceland [23], the maximum level of segregation is given by the natural log of the number of groups used in the calculations.

For example, in an organization comprised of eight departments, the maximum entropy is log 8 or 2.079. The maximum score of 1 occurs when all groups have equal organizational representation. In the case of eight groups, each department consists of 12.5 percent of the organization's work force and, the greater the aggregated number of departments in an organization with unevenly distributed proportions of extreme personal and organizational oriented citizenship behaviour among organizational employees, through the pervasive negative effects of toxic employees on other employees, the greater the tendency for the department to move from absolute evenness and the greater the tendency towards organizational entropy. Conversely, the greater the aggregate number of departments in an organization with evenly distributed proportions of personal and organizational citizenship behaviour among individuals, the lesser the tendency towards organizational entropy. Concentrations of entropic organizational and personal citizenship behaviour may reside in particular departments in the organization and at different levels but each has the propensity to spread and negatively affect proximate subsystems [6].

Coldwell's [2] model of organizational citizenship entropy consists of an inverted U-shaped curve with *organizational sustainability* on the vertical axis and *levels of personal and organizational-oriented citizenship* behaviour on the horizontal axis.

The relative evenness and unevenness of the OCB distribution is seen as ranging from 0 (complete uniformity) to H (complete chaos). Points beyond HMin (minimum level of disorder) become increasingly even in OCB as they progress towards point 0 (complete uniformity). Beyond point HMax, (maximum level of disorder) increasingly uneven

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distributions of personal and organizational OCB become evident and as discussed earlier, can arise from the influence and spread of toxic employee behaviour.

Organizational and personal oriented OCB between HMax and HMin are regarded as areas of order in organizational departments (evenness of OCB distribution). In this area, balanced forms of OCB become increasingly evident. Increasing imbalances in personal and organizational OCB occur towards HMax and, become OCE which generate organizational toxity.

In general terms, Coldwell's [2], model suggests that increasing evenness in personal and organizational OCB distribution promotes organizational sustainability and reduces the probability of toxic employee OCB spreading and generating a toxic organization. Beyond HMin and towards 0, (complete uniformity) OCB distribution can potentially become problematical as it may reduce the organization's ability to adapt [16]. It should be noted, however, there are a range of values in the evenness of specific distributions in organizations that can exist without compromising the subsystem's sustainability [24].

*Distance dependent interactions and OCB entropy*

Ribeiro et al [4], state that: "The distance between individuals in a city is an important factor. For instance, the chance of two individuals meeting each other through common friends depends on the distance they live one from each other. Moreover, the impact or influence which one person has on another also may depend on the distance between them. Based on this, let us consider the stimulus strength of the individual $j$ over the individual $i$ be represented by the function $f(r_{ij})$, where $r_{ij}$ is the distance between them. So, based on recent empirical evidence, it is quite plausible to assume that the stimulus between two citizens' decays with the distance according to,"

$$f(r) = \begin{cases} \frac{1}{r^{\gamma}} & \text{if } r > 2r_0 \\ \frac{1}{(2r_0)^{\gamma}} & \text{otherwise,} \end{cases}$$

Where $\gamma$ is the decay factor. The distance $2r_0$ is the minimum distance between the individuals (e.g. distance of a house, or in the case of toxic employees, the distance between employees in individual offices or departments).

Ribeiro et al [4] with an assumption that $r_0 = ½$, found empirical support for the hypothesis expressed by the above equation which in general terms postulates that, the greater the physical distances between interacting individuals, the greater its decay. They found, for example, that the distribution of physical distances to be: $\gamma$=1.03, $\gamma$=1.12 and $\gamma$=1.0 and $\gamma$=1.20, for Facebook and e-mail respectively, and the frequency of cell phone calls with distance was found to range from 1≤ to ≤1.5.

Ribeiro et al [4] point out that reductions in spatial distances between individuals, characteristic of cities and urban environments, can improve individual stimulus and lead to enhanced creativity and socio-economic production. However, it seems entirely possible that

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given certain specific situations, negative outcomes from increases in individual interaction can stem from reduced spatial distances between individuals in urban environments.

*The concepts of employee and organizational toxicity*

Appelbaum and Roy-Girard [25], state:" Toxicity is a fact of life in all organizations; however, not all organizations are toxic. Toxic organizations are usually defined as largely ineffective as well as destructive to its employees. Simply having toxins present in an organization does not necessarily make it a toxic organization The tone of an organization tends to be set from the top and so toxicity is often a top-down phenomenon. The higher up the toxic person is, the more widely spread is the pain, and the more people there are who behave in the same way".

Although, as Applebaum snd Roy-Girard [25], suggest, toxins in an organization are often introduced by a leader and spread through the cultural climate created by that leader to managers and other employees, it is unlikely that a leader, however forceful or pervasive his/her influence might be, to create a toxic organization on his/her own, but he/she can create the necessary climate conducive to its spread and propagation. Toxic leadership is therefore a necessary but not a necessary and sufficient condition for a toxic organization to arise. Sufficient toxicity for an organization to become toxic can be initiated through top down leadership, but can only be made widespread through the collective behaviour of toxic employees.
For example, the recent Volkswagen crisis in which a group of company engineers decided to distort diesel emissions tests on its cars because a technical solution to the problem could not be found in the time made available to do this by the company and within the company's budget. But fertile grounds for this toxic employee behaviour were laid by toxic leadership. Driven by the company's determination to succeed in becoming the world's top selling car make, company leaders were prepared to create a climate that would stop at nothing in its will to attain this goal. The company was run by a highly centralized authoritarian hierarchy in Wolfsburg that expected employees to 'deliver the goods' no matter what. Thus the toxic leadership generated toxic employee behaviour that became culturally embedded in a toxic organization [26]. Although VW survived the' Dieselgate' crisis, it cost the company in the region of 30 billion US dollars to resolve [27]. The potential for the toxicity of VW leaders and employee behaviour spreading to other organizations and affecting their production and even going beyond that to the German economy as a whole, is clearly described in an article entitled: 'The domino effect of Volkswagen's emissions scandal [28], "recent emissions scandal is most likely to have far-reaching consequences. Rigging pollution results will not only cost the automaker dearly in terms of legal fines, investor and customer backlash, class action suits, possible criminal investigation, and loss of future sales, but the ill-effects of this scandal could spill over to other automakers, particularly Germans who make cars that run on diesel, and have a broader impact on the automotive industry. In fact, given how this scandal has everybody raising their eyebrows at the previously trusted and respected German engineering, the blow to the country's largest automotive company could, in turn, hurt the country's economic growth".
The kind of toxic employee behaviour being encouraged by the VW leadership hierarchy can be regarded as extreme forms of *organization-oriented OCB*, where employees were driven to go the extra mile for the company and forced to attain company goals no matter what. This extreme form of company oriented OCB generated OCE and complete disorder at VW.

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A contrasting example of toxic leadership and toxic employees which resulted in a toxic organization that developed from extreme *forms person oriented OCB* and ultimately led to its economic decline, is presented by Roddick's Body Shop [29]. The Body Shop was founded on social activism and principles of social and environmental change. Anita Roddick saw business as not simply the unwavering pursuit of profit to build a larger commercial empire, but also to influence social change and to make the world a better place to live in. Her focus was primarily on human rights and environmental preservation and she surrounded herself with employees who had been carefully selected to embrace these values. The company leadership ultimately created a toxic climate where the drive and emphasis to be people and community-oriented organizational citizens generated social activism that became inimical to the economic survival of the company. The company became the object of a number of ethics controversies and was initially sold to L'Oréal but is now owned by Brazilian Cosmetics Company "Natura Cosméticos" who bought the company from L'Oreal. in 2017.

## 5. Discussion

*Toxic employees and organizational entropy*

We have argued in this paper that not all distance reductions in spatial interaction brought through living in cities and working in urban organizations are necessarily beneficial by focusing attention on one highly specific example. This has allowed us to plot the effects of entropy in a more detailed and theoretically manageable manner. However, it would be quite wrong, as Ribeiro et al [4] suggest that increased social interaction provided by decreased interpersonal distances always leads to positive benefits at the micro level of individual interaction, through reduced transaction and communication costs, and at the macro level through improved economic performance. The effects of living and working in densely populated areas with small interpersonal spaces have many well documented negative examples described in the extant literature including, inter alia: increased crime, deconstruction of family life, drug addiction and sexual deviance. Our focus in this paper has been on the potential for small distance dependent interactions among toxic employees in organizations causing organizational entropy through the OCB theoretical mechanism described earlier.

The effect of toxic employees and their propensity to spread discord in teams and through the organization should not be underestimated. For example, Cornerstone Ondemand research [30], indicates that: "Good employees are 54% more likely to quit when they work with a toxic employee, if the proportion of toxic employees on their team grows by as little as one on a team of 20". Their research also shows that toxic behaviour in the workplace is contagious [30], "Likewise we found that toxic behaviour is contagious: in other words, employees are many times more likely to engage in toxic behaviour if they are exposed to other toxic employees." The research goes on to state that the indirect costs of toxic employees are even more of a financial burden than the direct costs of their toxic behaviour because of the wider destructive effect of this behavior on other employee in the organizations concerned.

Entrepreneur [31] identifies five types of toxic employee: the *hot mess* (incompetent), the *slacker* (lazy), the *martyr* (burnt out), the *socialite* (helper-friend) and the *sociopath* (bully). In fact, it is possible to condense these five toxic employee types into two basic clusters. The first is comprised of the slacker socialite type which represents the worker who is overzealous in *helping* behaviour, since this offers an opportunity for socializing with other workers while

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neglecting their own work responsibilities. Helping organizational citizenship–type behaviour is undoubted beneficial to the organization, but when taken to extremes and it becomes toxic behaviour, it is invariably inimical to the organization's effective functioning. The second cluster is made up from the martyr and sociopath toxic employee typology. Here the employee becomes so single-minded in performing the job and reaching company targets that he/she treats other employees as means to that end. Organizational citizenship behaviour that emphasizes working hard to fulfill organizational goals is beneficial to it, but in its extreme form, where it results in burnout in the individual initiating it, and stress a burn out in other employees that become contaminated by it, it can be highly destructive to organizational effective functioning. Gallo [32], indicates, "There's a difference between a difficult employee and a toxic one, says Dylan Minor, an assistant professor at the Kellogg School of Management who studies this topic. 'I call them toxic because not only do they cause harm but they also spread their behaviour to others', she explains. 'There's a pattern of de-energizing, frustrating or putting down team mates', adds Christine Porath, an associate professor at Georgetown and the author of *Mastering Civility: A Manifesto for the Workplace,* 'It's not just that Joe is rude. The whole team suffers because of it'. Thus, although a problem that can be acted on successfully by management [32], it is nonetheless, a potentially serious problem that can spread throughout teams and the organization as a whole.

Ribiero et al [4], have formally shown in their micro-bottom-up model of distance dependent individual interactions how interpersonal spatial distance reductions in urban environments lead to enhanced stimuli and positive outcomes. Coldwell's [2], model of OCB entropy has indicated theoretically how this micro interaction might also lead to organizational deconstruction (viewed as an urban subsystem) in certain contexts which Fistola [6] has suggested can through a process on contagion, undermine other urban subsystems.

Fistola [6], suggests entropy can be contagious in that entropy emerging within a single urban subsystem can promote a ripple entropy effect in other urban subsystems and if serious enough, ultimately, the city as a whole. Fistola [6], maintains that each single urban subsystem has the propensity to behave as an "entropic generator" that can produce a series of urban subsystem deconstructions that can lead, in extreme cases, to the collapse of an entire city. Fistola [6] conceives the urban system as being constituted by five interdependent subsystems, namely: the geomorphological subsystem consisting of the ecosystem and territory; the anthropic subsystem comprising urban groups and individual actors; the functional subsystem incorporating human activities in urban space; the physical system involving material factors such as buildings and equipment; and the perceptive system consisting of the city's public image. Fistola [6] maintains s that if the five urban subsystems are *in balance*, cities would be enabled to survive and prosper However, imbalances from their normal states can act as entropy generators which can lead to urban subsystem deconstruction. Fistola [6] describes entropy generation between subsystems as a process of deconstruction in entropy clusters that systematically remove energy from specific subsystems necessary for continued survival. Fistola's [6] notion of "enropic generator" and the potential destructive effect of one entropic subsystem on another is particularly relevant to the current paper. Fistola's [6] argument that a singular entropic subsystem is able to promote entropy in other subsystems from particular human activities clearly has important ramifications with the OCE model presented in the current paper.

A heuristic is presented in Figure 1 which displays the essential process involved in the evolution of a toxic organization from OCE to organization entropy and by acting as an entropic generator its spread to other organizations in the urban environment.

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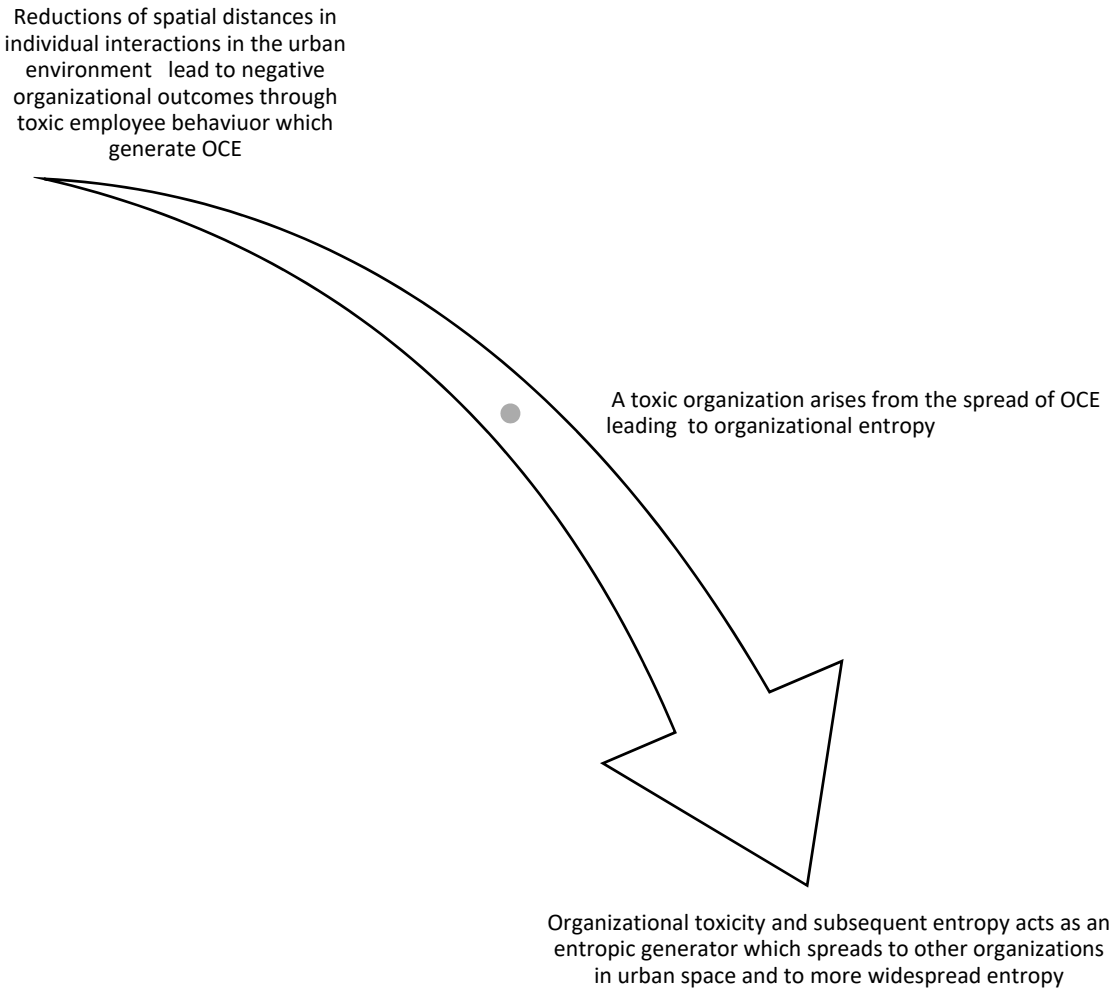


Figure 1. A heuristic of the OCE organization toxicity spread process

Figure1 indicates the broad process of outcomes of individual spatial distance reductions in urban environments from employee toxic OCB leading to a toxic organization and through a process of entropic generation [6] to more widespread urban organizational entropy.

## 6. Conclusion

The paper has presented a model devised by Coldwell [2] to describe how toxic employees through their extreme forms of organizational and personal oriented OCB, can generate a state of OEB that can lead to urban subsystem deconstruction. Following Ribeiro et al [4] and Fistola [6], it has also been suggested that entropic deconstruction in a singular urban subsystem through organizational toxicity can spread to other urban subsystems, and that a deconstructing urban subsystem can act as an 'entropic generator' affecting other urban subsystems. Limitations to the paper include the fact that secondary data, rather than primary empirical data was used in the discussion and analysis. However, this is a general criticism that can be made towards a significant portion of the extant literature in the area where there tends to be a preponderance of theory and mathematical models and a shortage of primary empirical data supporting these formal models. This paper has tried to fill this gap by applying a process theoretical model supported by from secondary empirical data to the

specific management problem of toxic employees. The paper, while using a highly specific form of toxicity that arises from extreme forms of organizational and personal oriented OCB, makes a contribution to the extant literature by showing how Coldwell's [2] model supported by Ribeiro et al's [4] formal analysis of distance dependent interactions and Fistola's [6] notion of entropic generators in urban environments, can be applied to actual management phenomena.

The practical implications of the process model of toxic organizations' entropic formulation and spread are clear; toxic work behavior has the potential to deconstruct business organizations (urban subsystems) and threaten their survival and this has the potential to spread beyond the boundaries of a single urban subsystem**.** Management should therefore find ways to reduce the negative effects of toxic employees by taking pre-emptive remedial steps that may include: in-depth problem analysis, direct feedback to the perpetrators of toxic behaviour, manipulation of incentives and disincentives for behavioural change, or dismissal [32]. It is recommended that future research in the area should focus on the empirical validity and relevance of the theoretical structures (including the one presented in current paper) in greater detail.

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