

# Generalizing Through Conditional Analysis: Systemic Causality in the World of Eternal Becoming

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## ABSTRACT

The chief goal of any scientific endeavor is generalization. Kurt Lewin was a crucial figure in psychology who advocated for and created a system in which both the particular phenomenon in its richness and general laws could be established. Lewin emphasized the need for broad ranging concepts that would do justice to human existence and social reality. His credo - unify without undue simplification - is the cornerstone of science. We can see, on the one hand, Lewin's desire to remain loyal to the basic assumptions of science (e.g., laws, generalizability, explanations) and his dedication, on the other, to treating the whole person and the richness of human and social reality. It is clear from Lewin's look at science - *Wissenschaft* - that the epistemological treatment of generalization takes the form of catalysis (in Lewin's terms *conditional-genetic* explanation) – the study of conditions under which something happens. The study of catalytic nature of phenomena views the parts of a system, interacting with the other parts, to form a Gestalt - a whole that entails the person, the environment, and their relationship (*Umwelt*). In this approach, the phenomena cannot be studied as a-contextual, but embedded within a dynamic and changing system of becoming. There is a creative tension between the general and particular in Lewin's system of thought and his emphasis on holism. We address how the goals of finding regularities and laws co-exist with the notions of a dynamic and ever-changing world. How can social reality be modeled in any static terms if it is always in flux?

Keywords: Generalization, Catalysis, System, Holism

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It is mildly ironic that the question of generalization - a self-obvious goal of any *Wissenschaft* - is being disputed in the beginning of the 21<sup>st</sup> century. There are two general impulses - seemingly contradictory - undergirding much of the thought of psychologists such as Gordon Allport, Abraham Maslow, Carl Rogers, William Stern and Kurt Lewin. The first is an impulse towards a psychology that embraces the unique human being in the process of becoming. The second regards ensuring and promoting psychology as a science that establishes basic knowledge. Thus the former reaches towards concreteness, richness and fullness of human experience and the latter towards abstraction and the derivation of laws. Reconciling these dual projects has proven to be problematic since they have typically been regarded as antithetical and one must be sacrificed at the altar of the other. We here prove that such either-or attitude misses the point - it is precisely in the rich details of the phenomenology of

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the whole where generalized laws operate. In the biological, social, and psychological systems generality of laws results in amplified variability and uniqueness (Maruyama, 1963, 1999).

However in psychology today, the goal of generalization looms large in discussions of external validity and whether a researcher's findings apply beyond their sample to a wider population. This is a result of narrowing down psychologists' search for knowledge to the use of inductive generalization techniques. This inductive focus has been further fortified by the postmodern approaches that emphasize particular descriptions and localized knowledge construction - and deny the possibility of generalizations all together. That is, the very particular, relational and situated conditions of phenomena have seemingly precluded the establishment of general laws. The impulse of transferring knowledge from one context to another and establishing general laws are contradictory to the impulse of a postmodern approach that tries to do justice to the richness of human existence. Ironically, it fails precisely in that. Indeed, great novelists who describe the dramas in the lives of their invented characters - always particular single cases! - are appreciated precisely because they intuitively trigger generalization tendencies in their readers. Post-modernist ideology has made social sciences not into a depository of local knowledge, but of local stories of no generalizability. Anyone who wants to learn about the realities of the human condition gets more insight from the fictional characters such as Anna Karenina, Aureliano Buendia, or - even - Harry Potter. Something has gone dramatically wrong in the social sciences over the past few decades that the question of generalization could be not only found difficult to solve, but even denied as a problem in need for a solution.

As irreconcilable as the fidelity to the phenomena in its concreteness and the generalization of universal and lawful knowledge may seem to contemporary social scientists, we will visit this possibility. Does the uniqueness of psychological phenomena preclude generalization? If not, what then is the path towards generalization in the dynamic world of becoming?

#### **GENERALIZATION THROUGH CONCRETE UNIQUE SITUATION**

We address and elaborate generalization *through* the concrete situation and the uniqueness of human living. This challenging endeavor has been undertaken by various thinkers, including those we mentioned above. Gordon Allport (1955) succinctly described the nature of the dilemma:

The first fact that strikes us is the uniqueness of both the process and the product. Each person is an idiom unto himself, and apparent violation of the syntax of the species. An idiom develops in its own peculiar context, and this context must be understood in order to comprehend the idiom. Yet at the same time, idioms are not entirely lawless and arbitrary; indeed they can be known for what they are only by comparing them with the syntax of the species. (Allport 1955, p. 17)

The crux of the dilemma stems from the view that uniqueness - including context dependence - and transitory nature of human life and lawfulness are incommensurable. Kurt Lewin is widely considered the founder of social psychology and action research and, as we will discuss below, considered generalizability to be a chief aim of science and his research. Lewin was concerned with describing particular, concrete, and dynamic social worlds, as we will discuss below. Yet, Lewin also considered the development of abstract conceptual ideas and general analytical tools crucial to creating social change (De Rivera, 1976). Here we can specifically see the dialogue between the particular - a dynamic social world - and the universal or general law - how to change the social world, or social change. In this sense, Lewin's work created a



dialogue between what we might call “basic psychology” and “applied psychology”. For such a dialogue to occur, Lewin had to consistently deal with generalization from the particular to the universal. Instead of finding this an insurmountable problem and avoiding or reducing the complexity and uniqueness of human existence, Kurt Lewin argued that it was only by taking into account the very concrete and unique situation which includes the person that generalization is possible.

How did Lewin come to this insight and what are the implications for psychology today? We address these questions by examining Lewin’s treatment of the relationship between individual events and law in his treatment of the conflict between what he called the Aristotelian and Galilean modes of thought (Lewin, 1931, 1935, Valsiner, 1984). Lewin offers ample inspiration for possible pathways towards generalization while emphasizing the situation. We will then discuss *systemic causality* and how the notion of catalysis offers a promising conceptual tool that enables generalization.

**Theory and Action: Tensions in the Lewinian System:** Kurt Lewin posited that psychology had reached a stage where empirical work and the *piling up of facts* had become a detriment to the progress of psychology (Lewin, 1936). This evaluation is even more true now, 70 years later. Although empirical investigations provide a corrective to speculative philosophy, Lewin argued, it is the combination of theory and empirical research that is needed in psychology. Indeed, Lewin clearly emphasized the need for broad ranging concepts that would do justice to human existence and social reality and, therefore, called for concepts that could “unify without undue simplification; they must include both person and environment, both law and individual case” (Lewin, 1936, p. 7). We can see, on the one hand, Lewin’s desire to remain loyal to the basic assumptions of science (e.g., laws, generalizability, and explanations) and his dedication, on the other, to treating the whole person and the richness of human and social reality (Reber & Beckstead, 2009).

This posture - natural for any scientist at his time - can be found throughout Lewin’s writings; however, his analysis and discussion of the shift between Aristotelian and post-Galilean physics offers a penetrating analysis of the theoretical shortcomings of psychology as well as providing a nice philosophical grounding of his work and thought, especially in relation to the theme of generalization and overcome “the opposition between universal concept and individual event” (Lewin, 1936, p. 8). Notably, Lewin’s (1927, 1931) reflections on the conflict between Aristotelian and Galilean modes of thought illuminate the development of lawfulness that continues to undergird psychology and how this is interrelated with the process in Aristotelian thought of fixing the locus of causality in the object with the upshot that objects and events become detached from, analyzed, and understood apart from their surrounding environment and isolated from other objects.

**Aristotelian and Post-Galilean Physics:** Lewin’s critique of psychology and the development of his ideas stemmed in part from his comparison of Aristotelian and post-Galilean approaches to physics (Lewin, 1935). For Lewin, the use of statistical analyses - based on large samples - is largely derived from an Aristotelian framework that grouped objects into binary and homogeneous classes (e.g., cold and warm, light and heavy) and required events to be regular and frequent (e.g., orbit of heavenly bodies) in order to be considered lawful (and thus the object of inquiry for science). At the time of his thinking about the issue - late 1920s - the avalanche of the “empire of chance” (Gigerenzer et al., 1989) onto psychology was only starting.

The classificatory system in Aristotelian physics grouped objects and phenomena together around the *principle of commonality*. Accordingly, objects and events were grouped together



based their apparent similarities - what they had in common. In return, the explanation of a particular object's behavior was derived from these apparent similarities. For instance, *things that were light* (e.g., smoke, balloons, sheets in the wind) were grouped together because of their apparent quality of "lightness". Things that were light typically went up in normal conditions. This meant certain objects had an *upward tendency*. Objects within the classificatory group which exemplified this behavior/movement - an upward tendency - was explained to be caused by the essence of the object - the characteristic of being light. The immediate result is that phenomena become grouped *and* explained by the characteristics shared by the group. In our example, things were grouped by their shared light quality and the objects upward tendency was then explained by light quality. In this sense Aristotelian mode of explanation is inherently tautological in that phenomena are explained by the essence of the group in which it was included. All members of "class X" are characterized by the quality of "X-ness" being attributed to each and every member of the class.

Lewin pointed out that such kind of circular reasoning was quite common in psychology. He noted that circular reasoning leads to a kind of logic that, since negativity (i.e., Lewin is referring to a trait such as stubbornness) is frequently observed in many three year olds, negativity is inherent in the nature of three year olds (Lewin, 1935, p. 15). This logic further serves as the explanation for the appearance of a concrete case of negativity (ibid). This tautology is evident today throughout psychology - especially in cross-cultural psychology as differences between groups are interpreted to be caused by the static essences of "gender" or "culture" (Valsiner, 2007, p. 26). This approach and logic makes possible the sample-to-population form of generalization; however, these generalizations are undergirded by grouping individuals into homogeneous classes and transforming classes such as "American" into essences that then become projected into the psychological systems of the individuals and are posited as the causes of differences that are assumed by the *a priori* categorizations. Negativity.

Equally problematic for Lewin was that the classificatory system of Aristotle had profound implications for notions concerning lawfulness, and hence generalization. To reiterate, the essence of a thing and its behavior was derived by the class of objects it was grouped with based on abstract, common features. These common features, further, are based on the tendencies of objects (e.g., smoke and balloons have the tendency of upwardness) and linked with how frequent an event occurs. As Lewin (1935) commented, «It is these frequency rules .... that determine the nature and tendency to be ascribed to each class of objects» (p. 7). That is in order to glean the tendency of any object it must be occur repeatedly and frequently. Thus the criteria for lawfulness from the Aristotelian view centered on commonality and frequency of objects and necessarily exclude one-time or individual events. Lewin (1935) argues that this approach inevitably leads to the conclusion, "that which does not occur repeatedly lies out of the realm of the comprehensible" (p. 14). This frequentist model, Lewin argued, permeated (and currently – 70 years later - dominates) psychology through the use of statistics and the deriving what the group has in common via the mean. Of course psychology's reliance on the mean remains unabated - whether this is in experimental or survey methods - and replication remains a crucial (and yet seldom non-utilized in current psychological research) criterion for generalization.

The consequences of a frequentist approach are at least threefold. First, individual events are viewed as incomprehensible and arbitrary since "lawfulness is believed to be related to regularity, and considered the antithesis of the individual case" (Lewin, 1935, p. 17). Of course, this emphasis on frequency and regularity has lead psychology to institutionalize statistics as *the* path for constructing knowledge and laws. Furthermore, as Lewin (1935) notes, "such



statistical investigations are ... unable as a rule to give an explanation of the dynamics of the processes involved” since they adhere to the same tautological traps mentioned above (p. 21). Individual cases must be combined to form averages. De Rivera (1976) describes the implications of this approach

The effect of this focusing on averages rather than individuals is that the experimenter makes the objective conditions the “subject” of the experiment, rather than his subjects. It is presumed that a particular experimental situation<sup>1</sup> has the same meaning for each subject (or each subject within some designated class). Since, in fact, different subjects may give an objective situation quite different meanings, and since apparently similar responses may also have different meanings, it is evident that different processes may be occurring in different subjects. Consequently, there are many different possible interpretations, and one is not sure of their theoretical significance. (Rivera 1976, p. 11)

As a result of focus on regularity and the high value placed on observation and classification instead of theory-building, the individual and non-repeatable events - and thus uniqueness - are forcefully eliminated from psychological investigation. Consequently, as Gordon Allport observes, psychologists interested in studying human beings are lead to “look for universal processes common to the species” and study “mind-in-general rather than mind in particular” (Allport, 1955).

**Move to a post-Galilean view:** The shift from an Aristotelian approach to Galilean or post-Galilean can be seen in the notion of lawfulness and the change from a strictly historical approach leading to an emphasis of frequency and regularity to the concrete situation and notions of interdependency and interrelationships as fundamentally constitutive of objects. Importantly, the post-Galilean view rejected the Aristotelian idea that regularity, frequency and repetition were the hallmarks of lawfulness. The Galilean mode of thought, then, extended law from solely repeated and frequent events to one-time and unique events. Significantly, this transition to an “all-embracing homogenization and harmonization of the whole field ... gave to Galilean physics the intoxicating feeling of infinite-breadth, because it does not, like abstract class concepts, level out the rich variety of the world and because a single law embraces the whole field” (Lewin, 1935, p. 23). The homogenization of law, for the Galilean thought and for Lewin, does get rid of heterogeneity or the “rich variety of the world” but rather allows for both law and uniqueness. Individual cases and events are not opposed; instead, generality is reached through the particular and singular phenomenon. Yet this law (and form of generalization) did not derive from an abstraction that lumped together objects based on common features and tendencies regularly and frequently observed; rather, it was through taking the concrete situation as the basis and then determining the conditions under which different events occur. Every event, then, should be considered lawful in the sense of not a random and ultimately mysterious occurrence.

The Galilean mode thought, therefore, changed the locus of causation away from the *intrinsic properties* of the object to the structural relationships *between* objects. That this, the criteria of frequency and regularity, along with the teleological bent in Aristotelian framework, fixed the lawfulness and causality in the object irrespective of the environment and the relationships with other objects in this environment. Instead, with the shift to the Galilean view “the situation assumes as much importance as the object” and it is “only by the concrete whole which comprises the object and the situation are the vectors which determine the dynamics of the event defined” (Lewin, 1935, p. 29). That is while properties of objects

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<sup>1</sup> We can add here questionnaires and surveys (Wagoner & Valsiner, 2005).



belonged to the object irrespective of its surrounding, the Galilean view considered “weight”, for example, to be depend on the relationship between the object and environment (Lewin, 1935, p. 28).

**Field theory: A holistic framework:** The implications Lewin drew from the conflict of Aristotelian and Galilean modes of thought is reflected in his theory. As we have illustrated, Lewin attempted general law and particular situation, and to broaden psychologists’ subject matter or view of the human being. Lewin’s work, in contrast to many of his colleagues, focuses on developing a psychological science of the whole human being. For Lewin any recourse to inherent personality or essence of an individual independent of the environment could not assist in understanding human behavior. Understanding any human behavior entails understanding the situation of an individual as it exists for the particular person. This was captured in Lewin’s classic formula for behavior,  $B=f(P,E)$ , which states that behavior is a function of the person and environment for that person. Lewin’s field theory attempts to describe and specify the here-and-now field in which the person is situated in its totality (e.g., interrelations). The basic postulates of field theory, according to Lewin (1951), “are that (a) behavior has to be derived from a totality of co-existing facts, (b) these coexisting facts have the ‘dynamic field’ in so far as the state of any part of this field depends on every other part of the field” (p. 25). The whole situation was not static but instead dynamic and comprised of many different non-reducible elements.

Lewin devoted considerable effort to how to represent the field or life space of a person. Again, the person was considered to be interdependent with her environment and therefore could not be understood separately from it. The environment and here-and-now situation was a constitutive part of the person’s behavior and one cannot disentangle a person from their environment. Lewin (1936) thus tried to represent all “relevant” aspects of the situation as it existed for the person, and he offered the general guideline that “*what is real has effects.*” In other words, Lewin attempted to represent the heterogeneous field or life space of the person through detailed observation with an eye towards deriving behavior from the “conditional-genetic characteristics” of an object or event. These characteristics were dynamic processes that existed beneath the phenomenal properties.

**Towards a new understanding of generalization:** As discussed above, Lewin stressed the necessity of theory, but theory had to be tied to and informed by rich descriptions of all relevant aspects of the life-space of the individual. De Rivera (1976) has noted that, “because of the unique situation of every subject, [Lewin] argued for the study of each individual case” (p. 18). Yet for psychology to be a science -in the sense of *Wissenschaften* - it must also discover laws and allow for generalizability. Stressing the value of theory, Lewin asserts that the accumulation of facts through empirical studies cannot “answer ... the question that is most important for practical purposes - namely, what must one do to obtain a desired effect in given concrete cases?” (Lewin, 1936, p. 4). Laws, for Lewin, “define functional relationships between different characteristics of an event or situation ... [and] are nothing more than principles according to which the actual event may be derived from the dynamic factors of the concrete situation” (Lewin, 1936, p. 11). Field theory was Lewin’s attempt to bring theory building into dialogue with the concrete situation. This concrete analysis required the use of conditional - rather than causal - ways of thinking about experimentation (Lewin, 1927) that was a forerunner to our proposal for a catalytic focus in psychology here.

Field theory is not without flaws at the conceptual and practical levels. It has been criticized for its limitations on what can and should be represented in the field and weakness in the



mathematical formulizations (London, 1944). However, de Rivera reminds us that field theory is more of an approach than a rigid system of concepts to be applied to different psychological issues (De Rivera, 1976, p. 4). The richness of Lewin's concepts and his attempts to stay close to the phenomena of concern without undue simplification is impressive. Thus we take Lewin's ideas as suggestive ways to honor both basic knowledge construction and the uniqueness of human life. Paradoxically, it is just this emphasis on the situation as essential to generalized knowledge that is so provocative. Lewin (1935) pointed out that Galileo did not take an average of balls rolling down hills, but rather abstractly conceived of ideal situations and conditions and demonstrated that the behavior of a ball depended on the situation (p. 26).

Instead of ignoring the individual peculiarities of the situation, Lewin's "experimental phenomenology" (see De Rivera, 1976 for a discussion of this approach) and emphasis on describing the situation in as much detail possible reinstated the situation (i.e., person-environment relationship) as the key unit of analysis. Single events were no longer considered incompressible and outside the grasp of science. An additional implication to restoring the single and unique event to investigation is that it has the corollary effect of being closer to human experience. That is, we experience life as meaningful and purposeful, and not arbitrary and random as the Aristotelian mode of thought would imply. Furthermore, Lewin's approach was to connect the concrete to the conceptual and deal with the essential structures (i.e., relationships) that occur beneath observation and description. Instead of generalization based on similarities between common, abstract features, generalization is based on processes underlying the phenomena. Thus the focus on essential structures moves us from breaking phenomena apart and studying elements in isolation to a systemic orientation that is oriented towards *systemic causality*.

#### FROM CAUSAL VARIABLES TO SYSTEMIC CAUSALITY

The open dynamic system model is essential when studying the effects of the qualitative whole. Parts and their relationship to each other, as well as to the whole, have interrelated functions and effects and therefore cannot be treated as separate variables. Typical analytic study of psychological systems reduced the whole to its constituent parts, their relationships ignored, and only some parts are selected picked for studying. The system cannot be studied unless the aggregate of the qualitative whole is observed as a system - as interrelated parts functioning in relation to one another. This systemic approach was inherent in the Galilean mode of thought and was manifested in Lewin's focus on the concrete situation and behavior as a function of the person-environment relationship.

Modern experimental psychology attempts to reduce a complex system to its constituent parts. This allows for experimentation to produce causality in a one-to-one model - If X is present then Z follows. Such a formula begins to give birth to modern experimental methods, fortified by "If-then" logic (Slife & Richardson, 1995). In order to make sense of phenomena, psychology reduces the complex whole to variables that presumably "interact". Psychologies reduced one-to-one variable equations begin to acquire a mechanistic quality. Stern, who disagrees with the one-to-one causal and mechanical portrayal of the psyche, says,

The individual is more than an aggregate of physical and psychological phenomena; just what more is entailed here will now be expressed in terms of nonphenomenal attributes. Thus, the nature of these hypothetical components is not mechanical but "personal": the many and fragmented phenomena present within the individual are explained by and unified through attributes that originate or reside in the individual, insofar as the latter is a unitary whole. (Stern 1911, p. 48)



Emotion, cognitions, and actions are not isolated entities, but rather are enmeshed together and grounded in the whole person. Moreover, these inter-related domains are always dynamic. Dynamics implies change, and change implies development. Therefore the generalizations must address and encompass change as long as the individual changes - thusly forcing psychology into a dynamic systems theory and requiring a dynamic model of generalization. Already back in the beginning of the 20<sup>th</sup> century, William Stern emphasized this point when saying that “the particular is ever subordinate to the general [even as] the general must ever accommodate the individual.” (Stern, 1911, p. 31).

Modern psychology, which selectively chooses and ignores parts of the whole in order to make causal statements, must develop a dynamic model - in theory, practice, and generalization. According to Lewin, the properties of a thing are not intrinsic to it but, rather, stem from its interrelationship with other elements in a given system - again reinforcing the dynamic interaction of parts within a system. Indeed, all psychological and behavioral functioning is part of an open and dynamic system. This means that all the processes and components of the system work as a qualitative whole to produce the resulting phenomenon. The validity of causal statements based on reductionist approaches is untenable because they fail to take into account essential aspects of the whole. A study of reduced or selected parts of the qualitative whole may yield an entirely different phenomenon (e.g., attempting to study the affect or religious ecstasy through the firing of neurons).

If phenomena are qualitatively organized by the whole system they are embedded within (and interrelated with) then generalization should not be based on premises of separate variables, but rather *generalization should be based on the premises of generalizing under what systemic conditions something occurs*. There are two important concepts to this epistemological view of generalization. The first is that of Holism - discussed previously. The second concept is that of catalysis - the study of conditions under which something happens (Salvatore, Valsiner, Straut-Yagodzinki and Clegg, 2009). The integration of these two concepts within an open and dynamic system can allow for the production of generalized knowledge that does not “butcher” the phenomena by reducing it to its elemental parts, but rather, describes, understands, and analyzes the phenomena as a qualitative whole.

**The Relationships and Interactions in System Theory:** In order to generalize the conditions under which something occurs, it is important to study the general models of open and dynamic systems. Open systems account for exchange and relation given the particular parts in the whole environment. This implies open ended and intransitive interactions - that is, provided that A, B, C stand for the parts of the system, and  $A > B$  stand for a relation, it might be the case that  $A > B$  and  $B > C$  while at the same time  $C > A$ . In general, an intransitive and open system can also suggest the relationship between two parts as equivalent to, or indeterminate (see below). Each of these relationship or qualities of “relating to” suggest an asymmetric relation. An asymmetric relation implies that A’s relation to B is not the same as B’s relation to A. A greater than sign implies a relationship of dominance. Therefore,  $A > B$  is equivalent to “A dominates B” or “A has dominance over B”. Consequently, a “less than” sign ( $<$ ) implies an asymmetric relationship of the dominated, an “equal” signs ( $=$ ) implies an equivalent power relation, and indeterminate implies an unknown relationship (Valsiner, 2000).

Model 1	Model 2	Model 3
$A > B$	$A > B$	$A > B$
$B > C$	$B > C$	$B > C$



$C > A$

$C = A$

$C \rightarrow [?] \rightarrow A$

Each of these models display different parts within a system and their relationship to some other part. The parts and their interactions with other parts as a whole is a system. But how can we conclude causality from such a system of interacting and exchanging parts? Two systems, with the same parts - A, B, C - but different relationship of the parts will yield different results. In each of the models the specific relation between the parts is of key relevance - if a relationship is taken out, the system collapses, and the result does not occur. Since the result is dependent on the interaction of *all* parts in the system, and not of the individual variables, we can conclude that there exists a causal relationship between the system and some outcome. *Systemic causality* fits the notion of causes of the qualitative whole and is necessary in constructing the generalization of conditions under which something occurs.

**From causality to catalysis:** Chemistry and biology have accepted the open and dynamic nature of systemic phenomena. Catalysis is the study the conditions that operate within open, intransitive, and dynamic systems that enable a particular outcome to be produced - *while preserving the functioning of the producing system*. Such model can provide sufficient foundations for generalization while still keeping the quality of the whole intact. This generalization can be reached through a process model that allows for the dialogical exchange between the particular and the universal.

Catalysts offer an alternative conceptual tool to investigate systemic causality (Valsiner, 2007). We can see the basic notions of catalysts in everyday life. For example, individuals walk down the crowded streets of Boston, Massachusetts on a daily basis. As a whole, the streets in Boston may be busy - a conglomerate of multiple people going various places. But, it is not everyday when the street is busy that the crowd becomes considered a parade, a rally/protest, or an anarchist mob. For example, it takes a declared holiday to transform the normal street environment and crowd into a parade. The elements - people, street vendors, police etc - co-exist and co-occur in everyday life. However, it is the creation and systemic implementation of the holiday that catalyzes and organizes these elements into the phenomenon of a “parade”. Likewise, it takes the specific catalytic conditions of a controversial socio-political event to modify the crowded street into a protest or rally. Thus the notion of catalysis can be employed to understand how repeated *and* unique events occur without reducing the complexity of life to more elemental parts.

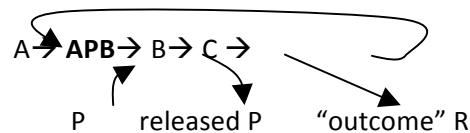
**The Psychological Catalyst:** In many systems, there are constrains or barriers that inhibit the occurrence of certain phenomena. It takes the help of a *catalyst* to lower the activation barrier - the barrier or constraint inhibiting a phenomena’s occurrence - in order to achieve the emergence of the phenomena. However, because the phenomena is a result of interacting and exchanging parts within a system, the catalyst has an important function of changing the relationships and interactions between one or more parts within the system. Similar to our open, dynamic, and intransitive system models, the catalyst changes the relationships of parts within the system to regulating, maintaining, ambiguous, or other relationships. As we stated above, system causality implies the change of one relationship within the system will yield a different result. Therefore, the catalytic overcoming of a barrier, resulting in the changing of a relationship not usually changed, alters the system as a whole, causing some novel (sometimes rare) phenomena.

Assume a system contains parts A, B, and C where  $A \rightarrow [?] \rightarrow B$ ,  $B > C$  and  $C > A$ . Obviously the open locus in this system is  $A \rightarrow [?] \rightarrow B$ —where [?] can take different forms (e.g. let these be <

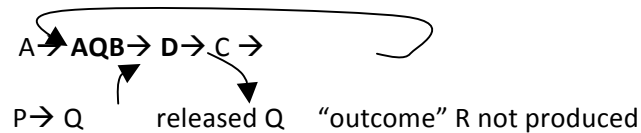


and >). If a condition P is present, the [?] takes the form of > and the system operates as a dynamic intransitive cycle (A>B>C>A... etc). The condition P is a catalyst—a condition necessary that is in itself not part of the causal system A-B-C—operates as the maintainer of the dynamic steady state of A-B-C.

How does the catalyst work? It may *temporarily bind with* the process of transition in the system, so the process observed in time may be



In the processes of transition there is an intermediate form - APB - that facilitates the transition in its stable form, and enables the production of the “outcome” (consequent)- R. Now, consider the scenario where the catalyst P is not available and is replaced by another one (Q). The system is now challenged and can change its organization:

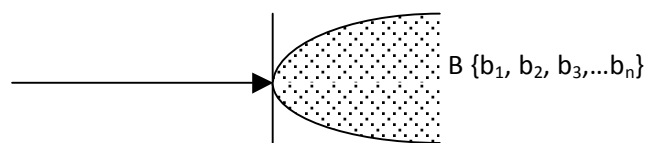


The new system ADC entails a loss of C and emergence of D as its part. Such qualitative transformation within the causal system itself is an example of development - brought by through the alteration of the conditions of functioning of the system. By way of changing itself the system ends up producing an outcome (R) - yet it keeps replicating itself in its “mutated” (B replaced by D) form. The causal system may return to producing R if the catalyst P replaces Q and if C can be replaced by B as a result. If not, the system has developed into a new irreversible form - triggered by the change of the catalysts.

The generalized feature of the causal system is its abstract quality—all causal processes are based on cyclical systems that reproduce themselves and may be triggered to modify themselves. All “outcomes” of these catalyzed causal systems are by-products of such self-preservation of the system. It is the catalysts—not “causal agents” that would produce “direct effects”—that lead to outcomes as always *indirect effects* of the causal system.

**THE TRANSITION STATE IN HUMAN LIVES: MAKING OF THE FUTURE**

Past, present, and future forms bring in the notion of becoming, emergence and development over time. The Trajectory Equifinality Model (TEM - Sato et al, 2007; 2009) explains the temporal relationship between a unilinear actualized past, an infinitesimal present, and the multiple potential trajectories of the future. Combining a catalytic model with the Trajectory Equifinality Model (TEM) gives the following: A person (A) has a unilinear actualized past and multiple future possibilities (Figure1):





past                      present                      future

Figure 1. The unilinear actual past facing the indeterminate future

The specific present conditions/context act as a catalyst (C) that help in the actualization of one possibility ( $b_1$ ) within the set of possibilities  $B \{b_1, b_2, b_3, \dots, b_n\}$  through the alteration of a specific possibilities ( $b_2$ ) relation and interaction with the rest of the possibilities within the set/system (Figure 2):

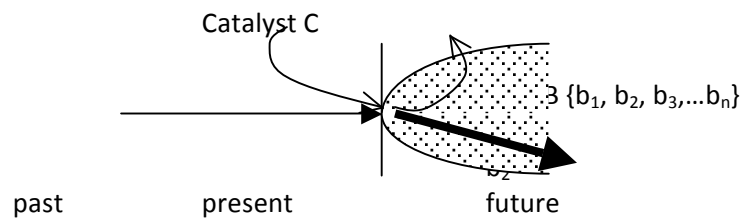


Figure 2. Catalytic movement towards determinate future

The catalyst lowers the “activation barrier” - the barrier inhibiting (or blocking) future potential from actualizing - for the binding agent. Human psyche operates through the enablement of future possibilities - allowing some of them to be constructed into actualities. Along the TEM model, intermediate catalytic development occur in the face of the future, along a series of possible future options within a set  $B \{b_1, b_2, b_3, \dots, b_n\}$ . The catalyst accelerates actualization of one of these possibilities by acquiring a regulatory role. This regulatory role changes the relationship of one of the parts with the others in the system, yielding a different result. For example, the catalyst (C) for the given person (A) may change the function of option  $b_2$  - bifurcating the trajectories so that anything other than option  $b_2$  is blocked and inhibited, while option  $b_1$  is promoted as an alternative – oppositional - course (Figure 3):

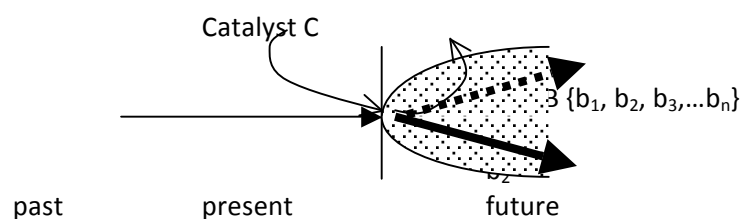


Figure 3. Differentiation of the trajectories for dialogue with the future

The options for the future are now limited to the  $\{b_1, b_2\}$  contrast, while the rest of the field of possibilities vanishes (Valsiner, 2009). The actual life course becomes negotiated by the future contrast  $\{b_1, b_2\}$  in its relation to recollected past contrast  $\{a_1, a_2\}$  - a bifurcation process that is reconstructed in the present based on the memories of the past.

**An example.** Processes of cultural catalytic kind can be observed in an example of cultivating and modifying the environment - what we call *graffiti*. In English, that term has undertones of illegality, rule-breaking, vandalism, and courage. This is not the case in other languages - Italian



for instance - where it designates graphic designs. Individuals have multiple ways of communicating messages (Figure 4). Under ordinary circumstances, the act of drawing on walls or filing cabinets is automatically blocked by our cultural system of catalysts. When confronted with the affordances of an empty wall and of pens in our hands, we nevertheless do not rush to use these affordances. The situation is very different if we are operating under the catalytic conditions of “protest” - here the usual regulatory mechanisms are overridden by the generalized feelings that turn the person into a creator of destructive acts. An individual may have a present message to be communicated, and they have an infinite number of ways to communicate this message. However, the minute the individual sets foot within a social setting, there is a regulation on what can be said and how messages can be communicated. Under no ordinary circumstances would an outside visitor enter an office and start writing messages on spaces not meant for those. Signs located in the activity setting (e.g., “No Talking”) and generalized norms (e.g., “one doesn’t talk about politics at the dinner table”) seek to restrict the range of possible messages. Furthermore, a person carries around a luggage of such cultural regulators within one’s own personal culture. Therefore, certain options of communication means are blocked by the catalytic condition of the social setting that is set up by various social institutions. These options begin to vanish away until they become extinct - or can be re-activated under conditions of change in the social atmosphere.



Figure 4. Ubiquitous takeover of (previous) blank wall on city street with ‘graffiti’

When a second set of catalytic conditions is present - the fear of condemnation and judgment (social punishment - the only options left are those of anonymity. This can be observed most often when one person writes what they truly feel by the means of graffiti. Observing graffiti then becomes a catalyst for others looking for freedom of expression to do the same - responding and adding to the original graffiti to the point that a graffiti dialogue may occur. A demonstration of disorder operates as an indexical sign - in C. S. Peirce’s terms - for allowing further construction of disorder. Yet when the general mode of operation for the self is constructive a sign of disorder calls for its elimination (“cleaning up”). A piece of rubbish next to a garbage bin calls for *putting it in* that container - while the same sign for a person on a mission of destruction suggests *pulling all the contents of that container out* to join the piece of rubbish.



**Emotional-Semiotic Mediators as Catalysts:** The regulatory function of signs can be seen through emotional-semiotic markers that re-configure the person-environment relationship. Josephs (2003) discusses emotional-semiotic and illustrates how catalysts synthesize parts where “direct and unmediated synthesis is not possible” without the catalyst (p. xii) through the following example [note: this example was initially used by Fritz Heider (1958)].

If I generally hate warts on the face, yet the man I fall in love with happens to have a permanent, hairy (and thus particularly disgusting) exemplar right on his chin, unavoidably tension is built up. Yet soon, if not immediately, I may find myself in a position to like, even tenderly touch this originally disgusting body mark ... There is neither mystery nor pathology in this process ... It is the powerful emotional-semiotic catalyst (my felt notion of love, and the value I attach [and I learned *should* be attached] to my partner) which radically transforms my relation to the world (here to a drastic exemplar of a wart) through an immediate overgeneralization of this value orientation .... What happened is an emotionally triggered transformation of my meaning-system due to a strong and felt value orientation - a higher level regulator (the catalyst) which leads to a new, generalized quality of the meaning-system. (Heider 1958, p. xiii)

In this example, the feeling and value of love, in this example, serves as the catalyst in reorienting the individual’s meaning-system and person-world relation. The feeling of love generalizes from something desirable - the loved one - to encompass what was previously disgusting. This emotional-catalyst acts as a higher order regulator and, as affective catalysts, function rapidly and beyond rational and step by step effort (Josephs, 2003).

Especially for our purposes concerning generalization, this brings us to two important points. The first concerns the holistic nature of catalysis and emphasis on the situation. This example includes a shift in meaning-system and value orientation based on the relationship of the particular person to the particular lover. Additionally, as Josephs’ parenthetically notes, the social suggestion that one should value one’s partner was embedded in the social context in which the person was interrelated. In order to understand the phenomena (i.e., meaning-change), we have to investigate the whole and not isolated parts. Second, catalysts are about (often) unique events and processes, and not averages. It would be pointless from this perspective to see if this particular shift (transformation of disgust to value and appreciation) occurs frequently and/or by many people. The matter at hand is the general process (emotional-semiotic catalysis).

**Generalizing the Catalytic Whole:** Since phenomena are not caused, but rather, are catalyzed, we must develop a concept of generalization that encompasses the general system in which something occurs (or results). The catalytic systems model not only incorporates the past, present, and future, of a phenomenon’s development, but also incorporates the qualitative whole of the system. The construction of the phenomena within this framework forces the observer to view the whole of the system, and not to forget or selective ignore those variables that, if forgotten or ignored, could result in a different phenomena, or no phenomena at all. This presents a model for experimental procedures that *must* consider person and environment as a qualitatively organizing whole.

**From the Particular to the Universal: Dialogical Generalization.** Lewin presented the dialogue between the particular and the universal. Generalization is the ability to abstract from the concrete, producing general representative features that can be applied to similar phenomena within a “fuzzy category”. Therefore, generalization is a dialogue between the concrete and the abstract or the particular and the universal. The catalytic model allows for understanding system causality in a qualitative whole, as well as the dialogue between the concrete and the



abstract. The catalytic model is abstracted from specific concrete phenomena - not of high frequency, but rather individual phenomena of rare occurrences - that are then applied (or generalized) to other rarely occurring phenomena. The generalization is not for the understanding of the likelihood, probability, or average frequency of the rare phenomena, but rather, to understand the systemic processes that promotes or inhibits the rare occurrences of the phenomena. School shootings do not happen everyday. It is hard to study the single variables, one by one, that “cause” that individual to shoot fellow students at the school. In fact, people and guns are present in our world with high frequency, but their synthesis and modification into school shooting rarely occurs. The experimental model of one-to-one causality is not sufficient in explanation. Rather, the catalytic model - showing the dynamic interaction of individuals, conditions, contexts, and catalytic agents - can aid in the understanding of things that do not normally occur without the presentation of a catalytic condition or agent.

#### CONCLUSION: GENERALIZATION TAKES PLACE BASED ON PARTICULAR WHOLES

The world exists in particulars - and any generalization from those is based on single unique encounters with the world. Psychology’s reliance on the multiple examples (samples) to generalize to an abstract sample (called “population”) is an impoverished proxy for the single case to generic case generalization. Lewin’s epistemological stance was clear and productive - proven by any practitioner’s inevitable reliance on the direct single encounters with the world.

Psychology seems to have confused the notion of *abstraction* and *democratic majority dominance* in its past century. The latter is what the trajectory of inductive generalization entails - the majority of the individual cases in a population is - poorly but representatively - captured by the reliance on the averages. Sure, an average is an abstraction as well - otherwise statements like “the children in the study were, on the average, in the 5.67 grade age level” would be immediately perceived as meaningless.

All generalization involves abstraction. In the case of generalization from a single case,

*to generalize is to recognize likeness which had been previously masked by differences; to recognize the likeness is also therefore to recognize these differences as irrelevant, and to disregard them from the point of view of the general conception (Baldwin 1901, p. 408, added emphasis)*

It becomes clear that our cognitive facility to discount immediately observable differences and replace them with an opposite focus - that of similarity - is based on our making of Gestalts in our meaning system. Such Gestalts come at different hierarchical levels - the higher levels entail generalization of the whole fields of experience. Thus, the perceptual detection of a “cloudless sky” and its color (“blue sky”) can lead to aesthetic generalization (“beautiful sky”) with hyper-generalization (“how beautiful!”).

Thus, generalization takes place by two routes: (i) the analytic-to-synthetic (recognition of differences and turning that recognition into recognition of likeness); and the (ii) holistic move to higher order Gestalts (within which there are no differences—the cloudless sky, or on overwhelming feeling of happiness, have no distinct parts to compare). In both cases the concrete details are substituted by signs. Generalization is possible through human preponderance for semiosis.

Social Reality is dynamic. That is to say, our world is constantly in flux and phenomena are constantly emerging (and in the state of becoming). When looking at science – *Wissenschaft* -



the epistemological treatment of generalization should develop out of the constraints formed by the post-modern push, that is, the very particular, relational and situated conditions of phenomena have seemingly precluded the establishment of general laws. However, other epistemological treatment of generalization and general laws need not be of a homogenous and classificatory nature (Aristotelian notion of principle of commonality), fundamental for the inductive generalization of frequent numbers (Aristotelian foundation of the objects “tendency” based on frequent recurrences) in a sample to a target population. Post-Galilean thought not only denied the epistemological treatment of generalization through “frequency”, but also changed the locus of causation away from the *intrinsic properties* of the object to the structural relationships *between* objects. It was Lewin’s development field theory that allows the particular and the general to engage in dialogue within the open and dynamic “field” or system. The development of systemic causality from Lewin’s field theory suggests that generalization should not be based on separate and independent variables, but rather, generalization should take place out of a catalytic model and the conditions under which something occurs. This conditional analysis provides fruitful grounds of not only the rare and frequent phenomena, but understanding the particular, the qualitative whole, and the relationships within a general framework.

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