Chapter 14
Semiotic Catalysts' Activators: An Early Semiotic Mediation in the Construction of Personal Syntheses

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> The mind is at every stage a theater of simultaneous possibilities. Consciousness consists in the comparison of these with each other, the selection of some, and the suppression of the rest by the reinforcing and inhibiting agency of attention (James 1890/1918, p. 288).

In its ongoing endeavor to approach psychological processes as systemic and mediated transformations, cultural psychology of semiotic orientation has furthered discussions on the production of particular outcomes (syntheses) under enabling conditions (catalysts). Central to this notion of psychological catalysis (Beckstead et al. 2009, p. 73) is the idea of semiotic catalysts as signs which provide the conditions for regulated personal syntheses to occur (Cabell 2010, p. 27), being catalysts themselves activated one step before the activation or inhibition of semiotic regulators (SRs). That is to say, catalyst activators can be conceived as signs that prompt any semiotic mediator to function as a necessary condition for a given semiotic regulation to happen.

This chapter aims at contributing to the discussions about the extension of the notion of catalysis to the realm of psychological investigation from the perspective of a semiotic cultural psychology and its systemic catalyzed causality model (Valsiner 2000). Thus, by considering semiotic catalysts as those "conditions that need to be present for a particular causal linkage to occur, and the absence of which does not allow the causal process to lead to an outcome" (Valsiner 2000, p. 75), this chapter aims precisely at exploring how some signs provide support for another sign to function as a semiotic catalyst. Thus, we expect to expand our understanding of the functioning of semiotic catalysts as contextual conditions for the semiotic regulation of ongoing psychological processes, by addressing the mechanisms involved in the very construction of such provision of conditions itself.

The first part of the chapter approaches three interrelated topics: a brief discussion on causation in psychology; a presentation of key aspects of both chemical catalysis and the systemic catalyzed causality model; and finally, the depiction of catalysts

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as directing and directed agents, which is presented along with the argument for extending the notion of catalyst activators from chemistry to psychology.

In the subsequent section, the main idea of "semiotic catalyst activators" is defined, the main processes through which it takes place are depicted, and its relevance for the academic field of interest is highlighted. An empirically derived example of catalyst activation within a narrated life episode is then provided. At the end of the chapter, the significance of the storied dimension of catalytic cycles and the centrality of the active human agent in their depiction are considered in the section that precedes the concluding part of the chapter.

From Causation to Regulation Through Catalysis in a Semiotic Cultural Psychology

The above mentioned systemic catalyzed causality model is embedded in a broader discussion related to the ways in which certain frames of reference conceive causal relations (Valsiner 2000). The very notion of causation in psychology has set the stage for discussions about divergences in the way it is thought of in other fields compared to that of psychological science. As Wolman (1971) points out:

> Psychologists may marvel at the sophisticated discussions of the philosophers of the physical sciences regarding physical causation, but there is not much to be learned from these discussions, and human behavior cannot be interpreted in the light of discontinuity of quanta nor by Reichenbach's principle of inderteminacy. The discussion of causality in psychology must be discussed within the framework of psychology. It was, indeed, a coupe de grâ ce to liberate physics from antropomorphism, but psychology deals with human beings and it cannot help but being antropomorphic (p. 882).

In his call for a "psychology-based philosophy of psychological science," opposed to a physical science-based epistemology, Wolman (1971) approaches the issue of causality in psychology, favoring the notion of a context-dependent causality that fits into psychological phenomena. However, schematic ways of depicting contextually driven causality models in psychology not only still require a broader acknowledgment, but also face challenges such as the one related to the suggestion of necessary causality out of correlational findings between variables (Wolman 1971; Sugihara et al. 2012). Furthermore, the predominance of the principle of separability, according to which a causal factor is unique to a given independent variable, leads to the study of complex systems as if they were subject to be treated as linear systems whose pieces can be understood one at a time instead of as a whole, as pointed out by Sugihara et al. (2012).

In that sense, the very terminology "causality" (or causation) must be questioned, in the search for alternative representations of changes in human psychological mechanisms over time, such as "systemic catalyzed regulation" (see the regulatory role played by emotional catalysts in Beckstead et al. 2009).

The Relevance of the "Condition Oriented" Characteristic of Catalysis to Psychology

In the realm of cultural psychology of semiotic orientation, the notion of synthesis through catalysis makes it possible to emphasize the semiotically mediated nature and systemic complexity of psychological outcomes (Valsiner 2000, 2002). With its roots in the nineteenth century, mainly with the contributions of Berzelius, the notion of catalysis entails hierarchical relations between catalyst and substrate elements of a dynamic system over time, with sequences of events leading to certain outcomes in a given way:

> *De la force catalytique*. Certains corps exercent, par le simple contact, une telle influence sur d'autres corps, qu'il en résulte une action chimique: des combinaisons sont détruites ou de nouvelles combinaisons prennent naissance, et tout cela s'effectue sans que le corps qui produit tous ces changements soit altéré. . . . L'action de cette force est plus générale, et en mê me temps plus mystérieuse, dans les opérations de la chimie organique, surtout dans les corps vivants. . . . Nous avons donné à la cause de ces phénomènes le nom *de force catalytique* (Berzelius 1849, p. 111).

> [*Regarding the catalytic force*. Certain corps exert, through a mere contact, such an influence upon other corps, that it results in a chemical action: a combination is destroyed or new combinations appear and all of that takes place without the alteration of those corps which produce those changes. . . . The action of that force is more general and, at the same time, more mysterious than the operations of organic chemistry, mainly in what concerns to living organisms. . . . We have called the causes of those phenomena *catalytic force*] (Berzelius 1849, pp. 110–111).

That mysterious aspect of the catalytic process became clearer in 1894, when Ostwald described the acceleration of chemical reactions promoted by catalysts (Van Nostrand's Scientific Encyclopedia 2008). One of the most relevant features of such a process for psychological inquiry is the emphasis on the relevance of certain elements that are considered as necessary conditions for a certain systemic causal linkage to occur in a certain way, as it has been referred to in a semiotic cultural psychology. It is precisely that "condition-oriented" characteristic of catalysis through the abstracted function of catalysts that has been brought into the field of cultural psychology of semiotic orientation (Valsiner 2000, 2002).

Another noteworthy aspect mentioned by Berzelius (1849), for the purposes of the ideas discussed here, is the outcome of the catalytic process: the appearance of new combinations of elements or of differentiated elements out of the destruction of existing combinations. Even though these elements obviously correspond to chemical substances in the specific context of chemistry, their regulated arrangement and rearrangement after being "acted upon" is the general aspect of interest here. In a semiotic cultural psychology, for instance, some of these syntheses or "new composite whole[s]" (Valsiner 2002, p. 255) may take the form of new meanings, new I-positions in the self-system and new forms of relations between such I-positions (Valsiner 2002; Valsiner and Cabell 2012, p. 88).

Those catalyzed outcomes, i.e., possibilities that were turned into actualities, ultimately emerge through the mediation of signs, which function as semiotic catalysts

upon SRs (promoter and inhibitor signs) (Cabell 2010, 2011a, b). Thus, semiotic catalysts change the relations between elements of one's psychological system at a given moment (Beckstead et al. 2009), creating optimum conditions for one's construction of personal syntheses in his or her meaningful encounters with the world. SRs, in their turn, can be of two kinds: intra-mental, directly used on ongoing psychological processes which mediates one's acting in the world (for example, an affective sign of mercy) and extra-mental devices which are used to "cultivate the personal-cultural or collective-cultural field" (Cabell 2010, p. 27), such as a novel or a film.

Such a way of approaching psychological phenomena sets the constructive human mind as a pivotal agent in the emergence of psychological syntheses. By doing so, the proposed model attempts to avoid suggesting necessary causation through correlation or depicting subjective syntheses as the result of the action of something else's exclusive feature, as it appears in Ganger causality (Sugihara et al. (2012). The notion of systemic catalyzed causality has been creatively approached and advanced through different aspects and it is doubtless that the concept of semiotic catalysts requires special attention from researchers in a semiotic cultural psychology due to its centrality in catalytic processes.

Beyond Reimorphism: The Personal Storied Nature of Semiotic Catalysts

By dealing primarily with human beings, psychologists must resist the reimorphism in the adaptation of concepts and ideas from other sciences, as it is pointed out by Wolman (1984). It is notorious that, with regard to the chemical catalytic reaction, for instance, the catalysts' most emphasized role is their promoting of the acceleration of reactions. Also, the "mere contact" between catalysts and reactants mentioned by Berzelius (1849) can be contrasted to the embeddedness of constructed semiotic tools in one's personal story in the psychological realm. In that sense, the reconceptualization of catalysis in a semiotic cultural psychology has been carefully reflected upon and furthered, as it can be seen in Cabell's reflections upon the autocatalysis phenomenon in a semiotic cultural psychology and upon a psychology of conditions (2011a, b), and Mattos's formulation of the notion of catalytic agent (2013).

Aiming at contributing to that reconceptualizing endeavor, one of the aspects that revolve around the role played by catalysts in chemistry is discussed here, namely that of "catalyst carrier or promoter." From its description as it appears in chemistry, its possible reconceptualization in cultural psychology will be discussed, under the label of "semiotic catalyst activator," with its personal storied nature being kept in mind.

Catalysts: directing and directed agents In chemistry, catalysts can both increase the rate of a reaction and direct its transformation towards one outcome in preference to another (Mellor 1937). In that sense, the role played by catalysts is broadened in two dimensions: promotion of speed as well as of specificity of the resulting products.

For instance, the vapor of formic acid (HCOOH) can be decomposed either into (a) hydrogen and carbon dioxide ($H_2 + CO_2$) or (b) water and carbon monoxide ($H_2O + CO$), depending on the catalyst over which it passes: In the first case, the catalyst is zinc oxide (ZnO) and, in the second, it is titanic oxide (TiO_2; Mellor 1937). This example deals with the catalysts' "directional effects" (Farber 1966) in their orchestration of the reactions.

However, catalysts themselves are also subject to the action of inhibitors (poisoning agents) and carriers (promoters). The former are foreign substances which damage catalysts' functioning by binding to their active sites in competition with the reactants (Van Nostrand's Scientific Encyclopedia 2008); the latter are materials which enhance catalysts' activity, increase their surface area, reduce their tendency to sinter by heat or prevent inhibitor agents from poisoning the catalysts (McGraw Hill Dictionary of Chemistry 2003; Academy Press Dictionary, 1992; Mellor 1937, p. 154). The oxidation of carbon monoxide is an example of two of these functions of carriers (Mellor 1937, p. 154): the catalyst "manganese oxide": (a) favors the oxidation of "carbon monoxide," but (b) can be deactivated by "alkali." However, (c) as the catalyst is combined with the carrier "cupric oxide," the poisoning alkali is prevented from interacting with the catalyst which, in addition, has its activity enhanced by its carrier.

The relevant aspect in this reaction is the shifting in the ways the directive role is played by the elements that are possibly involved in the production of the outcome. In the first case, that role is played mostly by the catalyst; in the second one, by the poisoning substance and, in the third, by the compound "catalyst + activator." As Mittasch (1936, as cited in Farber 1966) highlights, a catalyst "acts and submits to action, is free and conditioned, determines and is subject to being determined" (p. 174)—from such considerations, he detaches his reflections from the idea of catalysis in chemistry towards an increasingly abstract discussion on the issue of freedom and determinism (Farber 1966, p. 174).

In a generalized way, the previous depiction of catalysts' functioning can be broadly formulated as follows: A given necessary condition for an outcome to exist can either be the main directive agent in a systemic process or can have its own activity specifically constrained, i.e., reduced, enhanced, inhibited, or activated, by other adjacent elements.

By making such a statement, we slightly move away from the realm of atoms, molecules, and things alike, towards more generalized ideas concerning those elements in their mutual interactions and, ultimately, "wondering" about mechanisms that do not specifically (or strictly) refer to chemical elements. Such elaboration has to do with the constructive importing of abstracted ideas from one scientific area into another, aiming at reconceptualizing them in the new context with the subsequent emergence of new understandings of that new context.

If the aforementioned formulation of the catalysts' activity in generalized terms does make sense, the next step to be taken here is to further the notion of catalytic causality model in semiotic cultural psychology, mainly in what concerns to the concept of semiotic catalyst. We shift our attention, then, to the process of activation of semiotic catalysts in the construction of personal synthesis by outlining the main

features of "semiotic catalysts activators" and their functioning together with a given semiotic mediator in the semiotic catalytic cycle.

Semiotic Catalyst Activators

Semiotic catalysts activators (SCAs) are signs which "distinctively support" other signs to function as providers of the necessary conditions for a given semiotic regulation to occur; in other words, they support a given sign to turn into a semiotic catalyst. They are constructed and cultivated out of persons' meaningful encounters with their world, solely past encounters involving "specific dimensions of their lives" within which the ultimate outcome of a certain semiotic regulation is highly relevant.

Thus, this notion of SCA directly addresses the following question: "What leads a sign to function as a catalyst?" The main argument here is that signs are brought into the psychological system as catalysts through the person's "articulating" of other supportive meanings, named here as activators, "along with" crucial features of a given situation. These crucial or relevant features are always judged as such by the person involved in the situation according to his or her most prominent needs, will, interests, and intentions.

For instance, the act of informing the police about someone else (X) consists of an outcome that is likely to be promoted by signs whose situational organization is synthesized by a catalyst (e.g., "fear"). However, the catalytic function of such an "emotional-semiotic mediator" (ESM; Beckstead et al. 2009) "fear" is taken on at a given circumstance due to the conjunction of semiotic activators with it: previously existing meanings related to the central issue at stake (e.g., "X" is life-threatening; "X" is unintelligible; "X" is obscure, etc.), conjoined with a situational and critical novel phenomenon or some of its features (the confirmation of a suspicion or the revealing of a secret, for example).

In spite of such ESM "fear" may have emerged at similar circumstances in the past, playing the role of a SR, the situational organization of meanings favors the mediator "to be turned into" a catalyst. In other words, signs are "semiotically supported" towards a catalytic role, i.e., they "acquire" such a status—they do not simply enter one's psychological system "being" catalysts in themselves.

Figures 14.1 and 14.2 depict the same ESM "fear of being hurt" playing the roles of a SR and a semiotic catalyst respectively in two hypothetical conflicting episodes. The letters A and B represent two people involved in the episodes, which are represented by the "lightning," from person B's perspective. In Fig. 14.1, the black line represents the immediate emergence and mediation of the ESM which promotes the outcome indicated by one extreme (Y', which could be, for instance, "threatening the opponent back" or "killing the opponent") out of a set of possibilities ranging as far as Y" (calling the police).[1]

[1] See Valsiner (2004), on semiotic mediation at different levels of generalized abstractions.

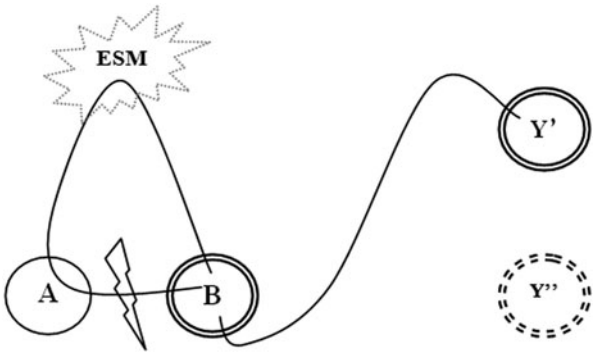

Fig. 14.1 An emotional-semiotic mediator (ESM) functioning as a semiotic regulator in a hypothetical conflicting interpersonal situation

Despite the inherent semiotic complexity of any human context of interaction, the intention here is to highlight a direct ESM towards a triggered reaction (an outcome) in a specific interaction. This kind of mediation is characterized by the presence of signs with low levels of generalized abstraction (Valsiner 2004, p. 15). It resembles the widely known neuroscientific account on "fight-or-flight response" the main neural substrates of which are subcortical regions such as the hypothalamus, amygdale, and hypocampus. These structures mediate the arousal of affective states which, in turn, mediate outcomes with minimal or no interference of reasoning processes (i.e., without frontal cortical processing) in perceived threatening situations.

In the activated catalytic cycle (Fig. 14.2), two aspects are added to the mediation depicted in Fig. 14.1: Relevant distinctive features, represented by the hachure in the lighting, are noticed in this new conflicting encounter and previously constructed signs related to this kind of encounter are brought into the system due to those perceived distinctive features (thick dotted line)—these two elements integrate the complex named here as "catalyst activators".

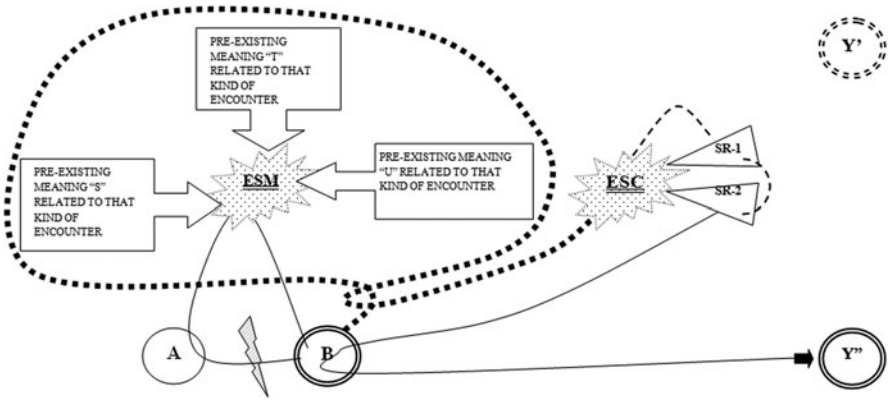

Fig. 14.2 An emotional-semiotic mediator (ESM) turning into a semiotic catalyst through the support of catalyst activators in a critical event

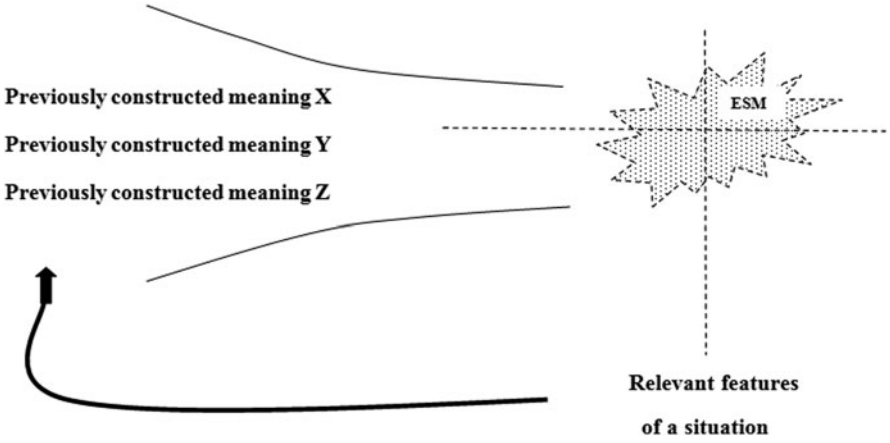

Fig. 14.3 Cultivated meanings are channeled into the meaning-making system, leading an emotional-semiotic mediator (ESM) to turn into an activated semiotic catalyst

The emerging semiotic mediator is thus provided with new contours of affective and value-laden meanings, becoming a catalyst by enabling the actualization of one of the future possibilities through the orchestration of promoter signs (thinner dotted line). Still referring to the hypothetical situation previously considered, the outcome Y" (calling the police) is promoted by the synthesized linkage of SRs such as "protect myself" (SR1) and "protect my family" (SR2).

In the depiction of the catalyst activation process (Fig. 14.2), it is assumed that signs pervasively emerge out of humans' encounters with their worlds as well as that binding semiotic emergences unfold over time. In the hypothetical example provided here, the ESM "fear of being hurt" is considered as the main emergence next to which binding representations of crucial features of that specific encounter with the world emerge: One might notice, after some time, that his or her opponent is using drugs this time, differently from the other times. Out of the complex flow of sensations, thoughts, and affects experienced by the person, previously constructed signs related to that crucial feature (for instance, "drugs users are life-threatening;" "people involved in the world of drugs threaten their enemies' relatives") are thus, brought into the system, setting the semiotic mediator in motion towards a catalyst role.

In sum, placed at the intersection between current perceptions and present functioning of previously constructed signs (Fig. 14.3), a given ESM is activated towards playing the role of a catalyst as: (a) relevant features of a situation, from one's perspective, are brought to the foreground of one's lived experience leading to (b) the channeling of personally cultivated meanings related to those highlighted features into the affective field.

The ESM has some of its characteristics transformed then: from "fear" to "extreme fear;" from "being hurt" to "being killed;" from "me" to "me and my family." The mediator, thus, is intensified and extended in such a way that it prompts the entering

of other related signs into the system (self-protection; protection of loved ones) under its regulatory role—in other words, the ESM turns into an emotional semiotic catalyst.

The Activation of a Semiotic Catalyst Towards the Decision to Report on One's Own Son to the Police

The notion of semiotic catalyst activators was derived from the analysis of narrative interviews performed by one participant who has taken part in a broader study on processes of integration of a violent loss of a child into bereaved mothers' sense of self.[2] In this section, some aspects of the study are presented and one episode of the participant's narrative is analyzed so as to illustrate the ideas previously discussed in this chapter.

Railroad Slums—The State, Criminality, and Personal Trajectories by All Saints' Bay

The study which this case integrates is an empirical investigation carried out in a financially poor urban area named *Plataforma*, in Salvador city, Bahia, Brazil (see Fig. 14.4). This area is located in a macro region named *Subúrbio Ferroviário* (Railroad Slums, in an approximate translation into English) which is composed of 22 neighborhoods inhabited by around 600,000 people (Fundação Gregório de Matos 2012).

The history of the region has the construction of Afrânio Peixoto Avenue in 1970 as one of its landmarks. Before that, the region was inhabited mainly by fishermen villagers and, occasionally, by vacationers. After the construction of the avenue, people from different parts of the city and the countryside moved in, without any urban planning and governmental support. It is noteworthy that the absence of governmental assistance has prevailed over decades, largely contributing to the emergence of two relevant social phenomena: first, an insufficient (in some cases, inexistent) availability of crucial public services such as schools, public security, health services, sanitation, sports centers, libraries, cultural centers, parks, etc.; and second, the strengthening of influence of religious institutions (mostly Catholicism, Pentecostalism, and Candomblé) and criminal drug-dealers' groups over the region (Reis 2010; Santos 2010).

[2] Neimeyer's theoretical formulations about meaning reconstruction in bereavement conditions (Neimeyer 1999; Neimeyer et al. 2002) is the main theoretical framework on which the broader study is based, in what concerns to bereavement issues. However, it has been omitted here due to my specific interest in catalyst activators in this chapter.

Fig. 14.4 An urbanized area in Subúrbio Ferroviário, Salvador, Bahia, Brazil. (From Reis 2010, p. 95)

Despite the oversimplification of this depiction, one of its highly relevant aspects is the high rate of criminal practices which tend to stain whole families' trajectories in many ways, from children's and young people's entry into criminal groups (at the age of ten, or even before that) to the killing of young people and its severe consequences, mainly to bereaved parents and close relatives (Santos 2010).

According to official statistics (Secretaria de Segurança Pública do Estado da Bahia 2012), an average of 140 people are victims of homicide per month in Salvador, and most of these crimes happen in poor and peripheral urban areas such as *Subúrbio Ferroviário*.

Collecting, Co-Constructing, and Analyzing Narrated Personal Trajectories

Through the mediation of a researcher who also lives in *Subúrbio Ferroviário*, four women were invited to participate in individual sessions of narrative interviews. After being provided with details about the aims, procedures, and ethical features of the study as well as having formally accepted to participate in the study and providing the researcher with sociodemographic information, the participants were invited to tell the researcher their personal stories related to their experiences as mothers, mainly as mothers of deceased children due to homicide.

The first interview was organized according to the narrative model proposed by Jovchelovitch and Bauer (2002). In the subsequent interviews, episodes considered meaningful by the researcher, i.e., episodes in which participants tried to integrate the loss into their personal stories were discussed further, mainly through specific and theoretically driven questions. One more meeting included the discussion of the organization of the data by the researcher at the beginning of the data analysis and, in the last meeting, a feedback was provided to the participants by the researcher.

An episodic-content analysis of the transcribed interviews was carried out, based on the categorical-content model proposed by Lieblich et al. (1998): (I) Selection of episodes—relevant episodes were highlighted and set apart, originating a set of subtexts, each one corresponding to a specific episode; (II) Identification of relations between events—passages of the episodes referring to specific events were highlighted and put in relation to one another, according to their role in the system (a whole given episode). This organization of the data was shared and discussed with the participant, generating more data to be analyzed; (III) Construction of visual and theoretical depictions of relations—such depictions of the system were constructed upon the previous step, with a focus on the process through which the main outcome of the episode was reached; (IV) Conceptual discussion—mechanisms identified in the analysis were discussed taking into consideration what has been developed regarding the concepts of interest of this study, aiming at contributing with advancements in that specific aspect in the field of semiotic cultural psychology.

A narrative episode (Freitag 2010), as a unit of analysis, is defined as:

- A set of interrelated events, located in time and space as well as in a certain temporal sequence. Information about these elements does not have to be "exact": one may remember a relevant episode which happened either on a specific date or on one day in high school; events may have happened "somewhere" around place "X" and the main outcome of a series of events may open a self-narrative.
- The events tend to be performed by a group of participants, even though they can also involve just one participant;
- The set of events has a specifiable beginning and an end, occurring under an overall theme;
- Its level of generality is established by the narrator: from those of our everyday lives (a meeting at work, a class, etc.) to those related to broader contexts (a historical event, a natural disaster, etc.), being the borders of those levels of generality defined within a continuum by the speaker;
- It is interconnected with other parts of the whole narrative, but it also has a level of independence from them. Its relative independence from other episodes is rather arbitrary and it is defined according to the speaker's perspective;
- It plays a role in relation to other parts of the whole narrative (e.g., emphasizing an aspect of an argument, concluding an idea, giving an example, suggesting what should be valued, etc.).

Rebeca[3]—Three Violent Losses over a Strong Person's Trajectory

Rebeca is a 41-year-old cleaning worker at a public department in Salvador, Bahia, who went to school up to the fifth grade in junior high school. According to her self-narrative, she grew up under very poor socioeconomic conditions but, in spite of that, she used to be very well-cared by her mother.

The first turning point in her trajectory happened when she got pregnant at the age of 15. For her, she says that was when childhood was left behind. "Walter," her first son, would be born in the following year and would be killed 18 years later.

In the following 7 years, she lived with her husband who is depicted as violent and reckless towards her and their sons. Rebeca finds her husband's behavior as a relevant contributor for their sons to become so revolted against them and to enter into the world of drugs. During that period, she gave birth to four other children, including "Leo," when she was 22 years old. In that same year, she got divorced.

At the age of 23, she started living with her second husband and "Ali" was born. In the following year, she reconciled with her former husband and had her seventh child, getting divorced some time later on.

When she was 33 years old (2003), Walter was killed at the age of 18, as mentioned before. Seven years later (2010), Ali and Leo (17 and 18 years old respectively then) were killed in different situations in the same year.

Since Rebeca always needed to leave home for working, she says she was unable to take care of her sons appropriately and that may have contributed, in a certain way, to their entry into the world of drugs and crimes too, according to her. Nevertheless, she also evaluates herself positively, as a strong person, for having been a very strict mother and a hard-working person—a "mother and a father at the same time," according to her.

Informing the police about her own son, Walter, as a personal synthesis The episode analyzed in this section was narrated by Rebeca in the second interview, at the point when she was required to tell the researcher about her relationship with Walter during his adolescence as well as their plans for his future back then. It starts with her coming back home from work and it ends with Walter's arrest. The main theme of the episode, according to the participant, is her decision to inform the police about her son.

According to the participant, Walter revolted against his own family due to the suffering inflicted upon him by his father, who used to go home drunk at the end of the day and beat him. At the age of 9 years, Walter left home to live with some acquaintances and, around the age of 14 or 15, he was already using and dealing drugs.

After emphasizing the conflicting relationship between her and her sons, she was required to mention any specific event as an example. Rebeca, then, mentioned one of their conflicts, as it follows:

[3] All personal names presented here are fictitious.

> Once, when he [Walter] was already a grown up and involved with drugs, he grabbed a pressure cooker lid and threatened me with a beating . . . We had an intense argument . . . I got really angry at him and I told him: "Listen, if you throw that at me, I will kill you!". I said that, I used that expression because sons do not beat their mothers, right? And he grabbed that lid to throw at me. . . . He did not throw the lid at me because I faced him down! I really did! I faced him down and he did nothing then. . . . I told him I'd kill him! I told him: "Look! Do not touch me! If you throw this lid at me, I'll kill you! . . . I did not mean it! Of course I am not courageous enough to kill anybody, right? That was just the way I found to express myself . . . I don't know . . . At that moment . . . I don't know . . .

After the passage above, Rebeca went on narrating about the way her mother used to overprotect her (Rebeca's) sons every time they made a mistake, as she (Rebeca's mother) had done during that episode involving the lid. In the sequence, the participant mentioned Walter's revolt against people in general, due to his long-lasting suffering: *I could see it by his facial expressions . . . And he was aggressive . . . So, you notice when your child is revolted, right?* That was the exact point in the interview in which the researcher decided to approach the issue of Walter's entering into the world of drugs. During the subsequent 2 min and 49 s, the participant narrated the events which led her to inform the police about her own son, resulting in his arrest:

> Listen: I have always been a very watchful mother and I had never seen him smoking marijuana or using any other kind of drugs. But I started to notice those strangers going to my house to talk to him! Then I started to link things and when I would ask him whether all that had anything to do with drugs he would always deny that! But I am not one of those mothers who are always pretending they do not see their sons' mistakes.

The subsequent events which integrate this episode are organized in Table 14.1 according to their role in the system in which the catalyzed outcome "informing the police on Walter" emerged. Key passages of the episode are italicized:

Considering the existing model of systemic catalyzed causality model, two new elements are inserted into the system: a critical event and the activating system (composed by some situational features perceived as highly relevant and previously constructed meanings related to those features which are brought into the system). It is relevant to note that, in the local media, there is an intense broadcasting of news related to violence in the Railroad Slums.

Including those new elements into the catalytic system favors the consideration of the personal synthesis ("I decided to inform on him") as an outcome that has a personal-historical dimension in specific ways. The previously constructed meanings "drug-dealers as life-threatening to their enemies' families" and "drug world as an unknown reality" were "channeled" into the system through the situatedness of Rebeca's personal experience, i.e., her initial witnessing of Walter's aggressive behavior followed by the confirmation of a suspicion. It is assumed here that contextually constrained affective states arose from the very moment Rebeca met her "extremely upset" son as she was arriving from work.

What can be seen here is a personal infusing of meanings into the affective field in such a way that the latter turns into an emotional–semiotic complex which, from then on, reorients both Rebeca's meaning system and her relation with the world. Regulator signs ("self-protection;" "protection of the other"), which mediate Rebeca's

Table 14.1 Main elements involved in Rebeca's personal synthesis of informing the police on her own son

Element of the catalytic cycle	Elements of the catalytic cycle in Rebeca's case	Excerpts
Critical event	Witnessing Walter's outburst	One day . . . when I came back home from work, he was extremely upset
Highlighted relevant features of "this" specific situation	Presence of drugs at home Confirmation of the suspicion that Walter was involved with drugs	*I did not know that he [Walter] had been selling drugs. . . . He had hidden some drugs somewhere in our house* He could not find the drugs, I did not know where drugs were and he got very aggressive and wanted to destroy everything at home!
Catalyst activators	Representation of drug dealers on the news Lack of knowledge about the world of drugs Walter was getting into	As I used to listen to the news on the radio . . . *They [drug dealers] usually go to their enemies' houses and kill their whole family* and . . . I knew nothing about that world he was getting into, the kinds of people he had been dealing with!
Semiotic catalyst	*Fear* of being killed (as well as afraid for Walter himself and their relatives)	*I got afraid that someone could go into our house and kill me, my mother, and my sister*, who were living with us at that time
Semiotic regulator	Protection (herself, Walter himself, and their family)	I did it *for his own sake!* I told him that was the way I found *to protect him and our family as well*
Outcome	Informing the police	I went to the police station; I went there and informed the police officers. *I decided to inform on him* and, then, he was arrested

action outcome, are brought into the meaning system, being differentially related to participants in the episode: Rebeca, Walter himself, and their family (Rebeca's mother and sister). In the core of this process, a human agent semiotically acts upon those environmental factors by which she is also affected.

The Relevance of Persons and Their Stories to Further Our Understanding of Semiotic Catalysis

Two contributions which can be derived from the notion of catalyst activators to that of catalysis in a semiotic cultural psychology are: first, the inclusion of some aspects of the history of a given catalytic cycle in its own depiction and, second, the centrality of the active human agent in the catalytic cycle.

The very notion of catalysis is a kind of methodological expansion when psychological syntheses are being dealt with: There is no longer one element (with a certain exclusive characteristic) causing the emergence of something else. Instead,

there are some elements being oriented in a specific way under the influence of one or more necessary conditions. By zooming in on the visual depiction of the catalytic cycle, we can see that those conditions are "necessary" due to their "becoming so," instead of due to their "essentially being so": they can be either "one out of a range of conditions" for a certain synthesis to occur (depending on the contribution of contextual and preexisting elements for them to become catalysts) or they can become the catalyst for a range of psychological syntheses to take place. That is what has been referred to as the personal historicity of semiotic catalysts through catalyst activation in this chapter.

Consider a given psychological outcome that may emerge out of the catalytic influence of any of a wide range of elements from X_1 to X_n. What will mostly define which one will function as a catalyst is not their intrinsic properties, as it is very likely to be true in chemistry. Instead, features of specific events meaningfully related to other existing elements will promote the assumption of a catalytic role by element X_5, for instance, instead of any other element within that range.

On the other hand, if we take the example of the practice of graffiti on walls in a context of protest, we can think of such context as a catalytic agent (Beckstead et al. 2009). Furthering our analysis, we can also think of specific features of the context that are brought to the forefront of one's perceptual field, triggering the influx of meanings into one's meaning system. Once linked to those "newcomers," the meanings of the protest can catalyze the action outcome of drawing graffiti instead of destroying monuments or hurting people, which can be easily catalyzed during public demonstrations as well.

The rather obvious centrality of the active human agent in psychological catalysis is intrinsically linked to the reflections above concerning the historicity of the catalytic cycle. Despite the variation in the degree at which people "deliberately control" the construction of their personal syntheses, catalyst functioning is closely linked to some dimensions of people's personal stories: from sensations to perceptions, from bodily affective states to shared representations of them, from simple categories to highly elaborated moral values and other complex meaning fields made possible by (and contributors to) our reasoning skills. Human beings represent their worlds through signs and create the possibilities for those signs to play certain roles, such as a catalytic one.

Hence, when visiting a friend, if someone (X) notices that his or her friend (Y) has just started to yawn and to look at the clock and, right after that, "X" decides to leave his or her friend's home, an observer will reasonably argue that the set of the host's behaviors was a catalyst for the outcome (leaving Y's house) to emerge. However, if the visitor were, for instance, "X's" 20-year-old low-functioning autistic son, who was left by "X" in "Y's" house for some hours, there would be no catalytic function in "Y's" behavior per se due to the fact that "X's" son would probably have difficulties in interpreting and representing "Y's" behavior the same way "X" would have done.

Over a century ago, James (1890/1950) argued that "thought tends to Personal Form" (p. 225). Aside the discussion about what James meant with the term

"thought,"[4] he emphasized the personified nature of the human mental procession, out of which no thoughts can be found (despite the abundance of artifacts in the world which are human constructions, it could be added). States of consciousness, thus, are "found in personal consciousnesses, minds, selves, concrete particular I's and you's." (James 1890/1950, p. 226). This relevance of the human agent in the study of psychological processes has reappeared in different contexts of psychological science over the years, as in the contrast between anthropomorphism and reimorphism discussed by Wolman (1971); more recently, in a cultural psychology of semiotic orientation, the "semiotic reflexive construction" (Valsiner 2002, p. 252) is an appropriate example of this kind: a specific point in space (here) exists in the flow of time (now) and is perceived and reflected upon by an agent (I), such system being a starting point for an "expansion of different perspectives" (p. 252).

As it can be seen, the emphasis on the personal dimension of the catalyst functioning aims at justifying the theoretical notion of semiotic catalyst activators which, as relevant contextual elements, are expected to be considered in the importing of the abstract notion of catalysis from chemistry to psychology.

Conclusion: Semiotic Mediators Turn into Catalysts Through Contextual Activation

The approach to the generalized notion of catalytic processes has furthered the systemic view on the issue of causation in a semiotic cultural psychology, mainly in three aspects: the conditions without which a certain outcome is not likely to occur (the catalysts), the other elements which are present in the system in a given circumstance which the catalysts bind with (corresponding to the substrates in chemistry), and the catalyzed outcome or synthesis. This chapter deals with the first of these three elements, the semiotic catalysts, by claiming that they are mediators which are initially activated by means of some processes: first, through one's emphasis on specific features of a given situation, closely followed by one's canalization of previously existing signs, which are meaningfully related to those features, into the situation. Those canalized signs bind with an initial affective-semiotic field which had emerged since the beginning of that person's immersion in the situation, favoring the taking on of a catalytic role by a certain affective-semiotic mediator.

One issue related to the activation of catalysts which can be further investigated is the possible stability that some meanings may acquire in one's meaning system and their consequent tendency to function as catalysts in diverse occasions over time, rather independently from activators. Complementarily, the existence of "semiotic catalyst inhibitors" can also be considered, and one hint of this process could be seen in Rebeca's bringing the emotional-semiotic catalyst "fear of police officers' violent actions" into more recent conflicting interactions between her and one of her

[4] In sum, thoughts were considered by James (1890/1950, p. 186) as states of consciousness which suggest the omnipresence of references to objects "other than the mental state itself."

sons, who has also been involved with drugs. So, the generalized feeling "fear of drug dealers' violent actions" is a relatively stable and cultivated semiotic catalyst in Rebeca's meaning system, since it is the condition which indirectly leads her to occasionally consider calling the police again when one of her sons gets aggressive; but, on the other hand, that same catalyst is usually inhibited by a stronger sign (fear of police officers' violent actions), as she herself stated.

Extending a generalized idea regarding a process such as the chemical catalysis into the realm of human psychological phenomena poses us the challenge of building bridges that can justify such extension, as it has happened in previous initiatives (see Farber 1966, p. 173). Some of these bridges have already begun to be built in a semiotic cultural psychology (Valsiner 2000; Beckstead et al. 2009; Cabell 2010, 2011a, b): the origins and historical development of the concept; depiction of its main characteristics; abstraction of some of its characteristics and its contextualized application in the new academic field.

One justifiable way through which the notion of catalysis can be extended into the psychological science domain is that of metaphor, that is, "a cross-domain mapping in the conceptual system" (Lakoff 1998, p. 203). It implies that one domain of experience is understood in terms of a different domain (Lakoff 1998), through an established set of correspondences (mapping) between elements of both domains. In what concerns to a semiotic cultural psychology, such mapping allows us to reflect upon the systemic and semiotically mediated emergence of psychological outcomes using the knowledge available regarding chemical catalytic processes. Chemistry itself, for instance, uses the metaphorical expression "poisoning" to refer to the inhibition of a catalyst's functioning by a substance other than the substrates involved in a catalytic compound.

What comes next, then, is the task to justify our ideas about systemic catalyzed causality model in a semiotic cultural psychology within its own rationale and beyond the initial correspondences established between this model and chemical catalysis—and that is what the notion of catalyst activators is intended to contribute with.

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