Methods of Suspended Cognition: How interpretant-overload causes conversational incoherence

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Abstract

We all have experienced when our train of thought derails and fails to recover. To explain this cognitive phenomenon of Suspended Cognition, we first explored several theories of attention: selective attention (Yantis & Jonides, 1990), bottleneck models (Broadbent, 1958; Treisman, 1964), and the cocktail party effect (Cherry, n.d.; Conway, Cowan, & Bunting, 2001), which eluded to George Miller's (1956) magic number seven framing the spans of absolute judgment, in addition to the capacity of working memory; that as bits of information increase, our ability to confidently confirm knowledge decreases. Acknowledging these limitations of our environmental cognitive processing–as well as several other topics of condign exploration–plays a crucial role, in that our subconscious internalizes all perceptual information but forces us–the users–to focus on seven plus or minus two chucks of information at a time; in an effort too seamlessly interpret the world. I use 'in an effort' purposefully because there are moments when our cognitive reasoning fails us; such as, suspended cognition, which, evidently is the a palpable objective of delineation.

Keywords: attention, working memory capacity, interpretant, the Peirce-Büher interpretant conflux, cooperative communication, interpretant-overload, suspended cognition

1. Introduction

At one point or another, we all have experienced a moment when our train of thought derails and fails to recover; this derailing, is what I refer to as Suspended Cognition. In a recent study, this behavioral and cognitive stopping has been directly linked to the neural mechanism that the brain engages during 'surprise' events, which suppresses motor activity ostensibly via the subthalamic nucleus of the basal ganglia (Aron & Poldrack, 2006; Wessel et al., 2016; M. Fox, 2016). When one of these 'surprise' events occurs, our bodies, and brains, react similar to the stopping system you employ when getting out of an elevator and someone, getting on the elevator, is in your way; that same physical stopping system is stopping your train of thought (Aron & Poldrack, 2006; Wessel et al., 2016; M. Fox, 2016). With that said, this 'physical stopping' of thought derailing, though easy to perceive, gives little insight about how suspended cognition develops whilst in conversation.

As previously stated research has discovered the neurological mechanisms that cause suspended cognition, however there seems to be no prior existence of examining the cognitive processes that cause these mental relapses. Therefore, I developed the following theory:

Suspended cognition is the resultant of the interjection(s) of a syntactically salient sentence(s)–which hold(s) zero integrity to the conversation, in the perceptive of the listener–where there is so many variations of interpretive meaning that the mental processes exceed working memory capacity, causing an interpretant–overload, thus leading to conversational incoherence.

For further understanding, I am referring to a rather particular mental interruption that is not inflicted by a third party or outlier, such that the interpretant-overload developed strictly from the cohesion of a syntactic perception interpretation. Moreover, it is important to note that this development of suspended cognition occurs solely within the perspective of the listener; the one interpreting meaning from the phonematic utterances of the speaker. I would also like to emphasize the intentional defining, that conversational incoherence is at fault from a syntactically salient sentence, meaning that the speaker did not utter some formality on par with 'mumbo–jumbo' or an inebriated slur.

My cognitive interruption is comparatively low, on a recognizable level, to the inflected person; meaning, perhaps what someone said lead you to think of a correlating thought and you forget the initial reasoning for chucking those thoughts together, or perhaps what they said is not what your brain interrupted. For instance, that awkward situation when someone in passing says "Hello there" and you reply with "I'm good, thanks" You walk away believing you understood the exchange, while the passer becomes slightly confused or taken aback. Those are some conversational incoherence moments I am referring to; and the "I'm good, thanks" is an example of the syntactically salient sentence, holding zero integrity to the conversation, which causes interpretant overload. In regards to the other example, about internally correlations of thought, it is still a resultant of interpretant overload, but merely more in the quantifiable sense, where it becomes too much to process, thus causing conversational incoherence.

In an effort to explain why interpretant-overload is the reasoning for suspended cognition, we must explore and identify that cognitive processes possess limitations, especially within working memory capacity. Followed by a brief, yet adequate level, explanation of what an interpretant is, in regards to its origination and symbolic purpose, through the words of Peirce and Bühler, in addition to the convergence of their ideals. Trailing off into some basic fundamentals of conversation and the unspoken rules of cooperative communication. Followed by how I identify and define an interpretant–overload, alongside several cases that, if not explored could be seen as a threat to the cohesion of my argument. Which, subsequently leads into the unfurling of suspended cognition.

2. Limits to Cognitive Processing

The human brain has a mind-boggling amount of complexities that allow us to interpret the world within 100ths of a millisecond, in order to make judgments and decisions of action simultaneously. One can perceive why, at one point, these subjective assumptions were advantageous for Homosapians in our evolutionary pursuit for survival. However, researchers from varying disciplines of cognitive science, today are more concerned with the following fundamental question: how do our brains determine which environmental stimuli is important to cognitively process, compared to which stimuli are non-crucial. These processes of selected attention are not limited to one dimension of stimuli, such as perceptual, auditable or sensorial; they can overlap depending on the stimulus environment.

One example of selective attention crossover, or directed attention, was tested when a participant was driving to a relatively new location with their radios playing; upon identifying which street is the intended goal, most turn down the volume in order to effectively improve their input, or channel capacity (Miller, 1956) to the visual parts of the brain (Yantis & Jonides, 1990; Latham, 2006). Yantis (1990) goes on to say that the factors involved in this directed attention depends on ones attentional capacity and the processing requirements–essentially how much cognitive processing power is needed to make inferences about the input stimuli (Yantis & Jonides, 1990; Latham, 2006; SanMiguel, Corral, & Escera, 2008).

Another type of selected attention is the bottleneck model, where Broadbent's (1958), Treisman's (1964), and Deutsch and Deutsch Models predict that we cannot consciously attend to all of our sensory input at the same time (McLeod, 2008). In comparison, the bottleneck model illustrates the idea that stimuli are filtered through a funneling system where not every piece of information becomes consciously processed on the other side–with some fundamental variations between the three converging theories (Cowan, 1988; Escera, Yago, Corral, Corbera, & Nuñez, 2003; SanMiguel et al., 2008), while directed attention is the conscious selection of attention (Yantis & Jonides, 1990; Latham, 2006; SanMiguel et al., 2008).

With this in mind, another phenomenon arises in selective attention called the Cocktail Party effect, where one can focus their auditory attention on a particular stimulus while filtering out a range of other stimuli (Cherry, n.d.; Conway et al., 2001). This effect is similar to directed attention, in regards to the listener being actively selective about which stimulus to process–much the same way that a partygoer can focus on a single conversation in a noisy room–yet also, has parallel ideals with Treisman's Attenuation theory where the listener has attended material funneling through the bottleneck, to which they're consciously aware of, as well as unattended material that still filters through our cognitive systems but in order to limit the demands of capacity processing, are not actively acknowledged until key stimuli show value–much like when you are engaged in a particular conversation but manage to hear your name being interjected into other's conversations across the room (Cherry, n.d.; Treisman, 1964; Conway et al., 2001; McLeod, 2008). The list of models and theoretical ideas of how selective attention necessarily is processed is not limited to the several I have presented here; with that said, they do hold value in acknowledging that cognitive processes possess limitations.

2.1 Working Memory Capacity (Plus or Minus Two)

George Miller (1956) sought to explain this discrepancy between the limits of one-dimensional absolute judgment and the limitations of short-term memory (working memory; Egeth & Pachella 1969). Drawing together data from several different experiments, Miller compared results obtained from unidimensional and multidimensional stimuli.

In a unidimensional absolute judgment–any judgment about a single stimulus–task a person is presented with a number of stimuli that vary on one dimension, in Pollack's (1952) experiment he asked listeners to identify 10 different tones varying only in pitch, and respond to each stimulus by assigning each tone a numeral (Miller, 1956). Performance is nearly perfect up to five or six different stimuli but begins to decline as the number of different stimuli increases (Pollack, 1952; Miller, 1956). In the end, people's maximum performance on unidimensional absolute judgment can be characterized as an information channel capacity of approximately 2 to 3 bits of information, which corresponds to the ability to distinguish between four and eight alternatives (Pollack, 1952; Miller, 1956).

In regards to multidimensional stimuli, Miller (1956) reflected upon several experiments; however, since the inferential processing of these experiences hold no value in examining here, I ask if you are interested about said proceedings to explore them on your own. Klemmer and Frick (1953) concluded that a two-dimensional square would require two judgments of the interval type, therefore if few have a capacity of 3.25 bits for estimating intervals; it makes sense to do this twice, resulting with 6.5 bits as our capacity for locating points in a square. From Klemmer's and several other's two-dimensional examples, Pollack and Ficks (1954) try to bridge this gap to the multidimensional stimuli–provided by faces, words, etc.–with one auditory study. At the end of their experiment, Pollack and Ficks (1954) concluded that a set of tonal stimuli that varied in eight dimensions–but required only a binary decision on each dimension–that these tones measure the transmitted information at 6.9 bits. To understand the importance of this revelation, Miller (1956) explains it as follows:

> "*There is a clear and definite limit to the accuracy with which we can identify absolutely the magnitude of a unidimensional stimulus variable. I would propose to call this limit the* span of absolute judgment, *and I maintain that for unidimensional judgments this span is usually somewhere in the neighborhood of seven. We are not completely at the mercy of this limited span, however, because we have a*

variety of techniques for getting around it and increasing the accuracy of our judgments."

In other words, Miller is proposing that, necessarily, one's span of absolute judgment, or ability to confidently confirm a particular stimuli input, resides within the neighborhood of seven, plus or minus two; this exception is the resultant of us possessing alternative processes depending on the circumstance. In addition, Miller (1956) concluded that memory span is not limited in terms of bits but rather in terms of chucks. A chuck is the largest meaningful unit in the presented material that a person recognizes–thus, what counts as a chuck depends of the knowledge of the person being tested (Miller, 1956; Egeth & Pachella, 1969).

To recap, within this section we explored the following theories of attention (which are not limited to): selective attention (*directed attention*), bottleneck models, and the cocktail party effect; followed by Miller's magic number seven framing the spans of absolute judgment, in addition to the capacity of working memory. These ideals will become notable necessary later on in order to understand the development process of suspended cognition, in regards to how attention, both conscious and subconscious, and working memory capacity become defining variables that cause an interpretant over-load. However, first we must establish an understanding of what exactly is an interpretant.

3. What is an Interpretant?

In order to understand the overall argument I am proposing, we must, briefly yet effectively, explore the origins of what exactly is an *interpretant*, and later, it's developmental synthetization with another model, thus conceiving a new dynamic of interpretant understanding that plays a key role in suspended cognition.

3.1 Peirce's Interpretant

In the realm of semiotics–the study of meaning-making, or the study of sign processes and meaningful communication–in response to Saussure's two-part (dyadic) model of the sign, where a sign is composed of a signifier and the signified (DeSaussure, 1974; DeSaussure, Baskin, & Meisel, 2011), Charles S. Peirce suggested a triadic model of a sign, which accounts for the dynamism of the signification process and the role of a perceiving subject (Eco, 1976; Liszka, 1990; Rosenthal, 1990; Peirce, 2009; Lukianova & Fell, 2015). In his theory, Peirce has exactly three semiotic elements: a *sign* (a representaman)–represents, in the broadest possible sense of "represents"; an *object* (semiotic object)–the subject matter of a sign and an interpretant; and the *interpretant* (interpretant sign; Eco, 1976; Rosenthal, 1990; Peirce, 2009). An *interpretant* primarily refers to the understanding of a relation between an object and a sign (Eco, 1976; Liszka, 1990; Rosenthal, 1990; Peirce, 2009; Lukianova & Fell, 2015).

An interpretant is the most distinctive and innovative elements in Peirce's theory. By introducing the interpretant into semiosis, Peirce makes it crucial that for the content of the sign, to signify; the interpreter has to deduce/find significance from the sign in question (Eco, 1976; Liszka, 1990; Rosenthal, 1990; Peirce, 2009; Lukianova & Fell, 2015) In one of his definitions of a sign, Peirce refers to an interpretant as *the effect that a sign has upon a person* (Eco, 1976; Peirce, 2009; Lukianova & Fell, 2015).

With one simple introduction of the term *interpretant*, Peirce singles out the dynamic element in the relation between the sign and the person who perceives it (Eco, 1976; Peirce, 2009; Lukianova & Fell, 2015). In other words, the opposition between the complexity and dynamism of phenomena is lessened on one hand and the apparent simplicity and inertness of a sign on the other; as Eco (1976) says, *a sign can only be understood in the process of it being interpreted in communication*. Thus, as Lukianoya (2015) put so nicely, a sign (a static linguistic construct) can exist as such only in the dynamism of interpretation.

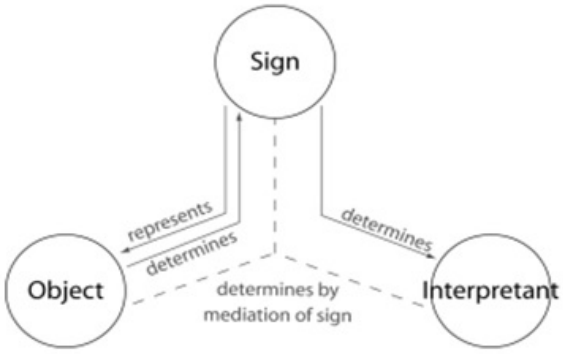


Figure 1: A visual representative of the relations between a sign, an object and the interpretant. An example, say there is a fire in the distance, but you cannot see the fire itself, just the smoke. The fire is *object*, the smoke is the *sign*, and you are the *interpretant*. The fire (object) determines the smoke aka the sign, and vice versa the sign of smoke represents the object of fire. Therefore, when the interpretant sees the sign of smoke, they determine the meaning of what the sign signifies.

3.2 Bühler's Interpretant

Karl Bühler developed the two-field theory of language: the *Zeigfeld*, or index field, and the *Symbolfeld*, or symbol field. The two fields are "the two sources out of which in every case the precise interpretation of linguistic utterances is nourished" (Bühler, 1990), by the situation (*Zeigfeld*) and the context (*Symbolfeld*; Innis, & Bühler, 1982). The symbol field is embedded with language signs, which is paradigmatically constituted by words used in their nominative or naming function; Bühler refers to these as *Begriffszeichen*, or 'concept signs' (Innis & Bühler, 1982). This field is radically different from the index field, to which Bühler insisted upon, even though there are certain linguistic entities–such as the demonstrative pronouns, that seem to walk the line–because, while the index words demand embedment in a *situation* in order to

be used meaningfully, symbols need a *context* wherein they can make sense (Innis & Bühler, 1982; Bühler, 1990). However, though both fields of theory are important, our main interest is concerned with Bühler's index field.

Karl Bühlers concept of index can be expressed through his developed framework for interpreting three kinds of deixis: *demonstratio ad oculos*, anaphoric deixis, and *deixis am phantasma* (Innis & Bühler, 1982; Bühler, 1990; West, 2013). Deixis refers to words and phrases, such as "me" or "here," that cannot be fully understood without additional contextual information–in this case, the identity of the speaker ("me") and the speaker's location ("here"); words are deictic, if their semantic meaning is fixed but their denotational meaning varies depending on time and/or place.

Demonstratio ad oculos employs either gestural indices, or linguistic ones (separately or conjoined); gestural signs which illustrate this use a dependent on visual access both to the sign and to its object from a Bühlerian perspective (Innis & Bühler, 1982; Bühler, 1990; West, 2013). The *anaphoric deixis* exists solely on the linguistic plane–both the signifier and its intratextual signified are present within the discourse; in other words, Bühler's anaphoric deixis consists of a linguistic intratextual referent, but not a referent assumed to be within the knowledge base and focus of both participants within a dialogue (Innis & Bühler, 1982; Bühler, 1990; West, 2013). *Deixis am phantasma* uses a gesture or a word to refer to a tangible object which is displaced from the time and place of the referring act, e.g., deictics referring to not an object in the 'here and now', but to a mental image or memory of the object; which Bühler claims can be constructed in the subjective perceptions and culminated dreams (Innis & Bühler, 1982; Bühler, 1990; West, 2013). The memories or dreams which emerge can be constructed and/or called up while using the conventional deictic to create subjective envisioning's or fantasies, especially while awake, meaning, Bühler's *deixis am phantasma* is the pointing to "*nothing*" (Innis & Bühler, 1982; Bühler, 1990; West, 2013).

The employing of deictic signs in referring to absent objects, is crucial because it constitutes a catalyst for more social, *conventional*, uses to more internal, *imaginative*, one's (Innis & Bühler, 1982; Bühler, 1990; West, 2013). Bühler's analogy of mental objects as a "mimesis" becomes the genesis for the claim that static and more dynamic memories–fueled by affect–drive deictics tor refer to more dynamic objects and more dynamic interpretants, into more constructed realities (Innis & Bühler, 1982; Bühler, 1990; West, 2013). Peirce's two types of objects (*dynamic and immediate*) and three types of interpretants (the "*emotional*", the "*energetic*", and the "*logical*") complete Bühler's deictic framework (Eco, 1976; Liszka, 1990; Rosenthal, 1990; Peirce, 2009). Peirce's contribution of the dynamic object to indexical sign definition, matched with his insistence that the interpretant is integral to the sign (heightens the semiosis of deictic expressions), accounts for the ongoing process of deictic meaning, undeveloped by Bühler, can now offer rationale for how it is that deictic use extends the semiosis of index (Innis & Bühler, 1982; Bühler, 1990; West, 2013).

To visually see this convergence between the two theories, refer to Peirce's model in (Figure 1) and compare it to Bühler's Organon Model of Language in (Figure 2); where the circle in the middle symbolizes the concrete acoustic phenomenon. Three variable factors in it go to give it the rank of sign in three different manners. The sides of the inscribed triangle symbolize these three factors. The parallel lines symbolize the semantic functions of the (complex) language sign. It is a *symptom* (*Anzeichen, indicium*: index) by virtue of its dependence on the sender, whose inner states it expresses, and a *signal* by virtue of its appeal to the hearer, whose inner or outer behavior it directs as do other communicative signs.

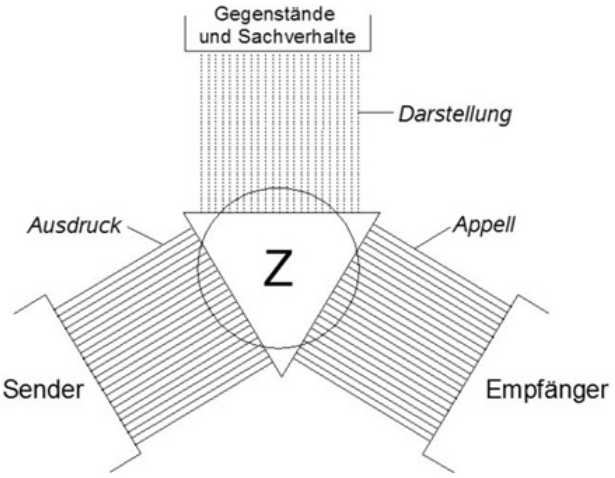


Figure 2: Bühler's Organon Model of Language. [Translations: *Ausdruck*–expression; *Appell*–appeal; *Darstellung*–representation; *Empfänger*–receiver/interpretant; *Gegenstände und Sachverhalte*–objects and facts]

Today, Bühler's prefer the terms *expression* (Ausdruck), *appeal* (Appell), and *representation*, because among language theorist 'expression' is increasingly taking on the precise meaning demanded here, and because the Latin word '*appellare*' (English: appeal, German: more or less '*ansprechen*') is apt for the second; as everyone knows today there is sex appeal, and in addition to that *speech appeal* seems to me to be just as palpable a fact (Innis & Bühler, 1982; Bühler, 1990).

3.3 The Peirce-Bühler Interpretant Conflux

Though there has already been talk and research in the convergent ideals of Peirce's interpretant and Bühler's Theory of language; I thought the coinage of *Peirce–Bühler Interpretant (PBI) Conflux* appropriately suiting for the mergence, which states that the interpretant's perception of meaning is strictly dependent on the interpretant's prior experiences, in addition to their perception of representative meaning is not limited to the laws of reality but rather limited to the in-

terpretants culminated fantasies and dreams. The PBI conflux is so important because it now accounts for humanities abilities of imagination–such as, if I were to say "pink elephant", though youve never seen a pink elephant before, you as an interpretant can perceive and (unintentionally) visualize said pink elephant within your own mind. The PBI conflux also considers an interpretant's initial subjective perspective, this is crucial on the individual's representative experiences. For instance, language on a lexical 'first-thought' occurrence varies from person to person. An example being, if I flashed a photo of *the moon*, some may initially respond with *the sun*, but perhaps someone else's initial thought was, *night* or *stars*; these are what cognitive psychology call *fuzzy boundaries*, where categorization can occur as a *dynamic associative*–when thoughts or like representations are categorized in relative 'bins', however these relations are not limited to such groupings–or *episodic memory*–when you recall information on a linear spectrum of experiences. Therefore, without this conflux, an interpretant, engaging in a cooperation to communicate with another, would not be capable of interpreting and/or understanding one other's thoughts of non-realistic imaginations, new ideas and thoughts of self-expression, or, in the worst-case scenario, lexical word-play (e.g., humor, irony).

4. Conversation in Principal

Communication is essential for any cooperation between two or more people to affectively convey thoughts and intentions. On a low basis of illustration, there are typically five stages in order to converse: (1) the *expression act*, where B (the listener) recognizes A's (the speaker) mental state from the locutionary act; (2) *speaker meaning*, where B reconstructs A's communicative intentions, including cases of indirect speech–indirect cases will be defined later on; (3) the *communicative effect*, which contains two processes: (a) *attribution*, where B attributes to A's private mental states such as beliefs and intentions; and (b) *adjustment*, where B's mental states concerning the topic may alter depending on A's utterances; (4) *reaction*, where B produces the intentions he will communicate in response; and (5) *response*, in which B produces an overt communicative response (Bara, 2011). All of this goes without saying that both participants have a relatively fluent understanding of the language chosen to converse with. However, the comprehending of the *expression act* and *speaker meaning* can affect the *issue of coherence*, because comprehension is a process shared and achieved between two people, where A, in principle, is able to predict how her partner, B, will reconstruct the meaning of her utterances (Plăcintar, 2007; Bara, 2011). In other words, if B fails to interpret As intentions communication fails.

In an effort to reduce the chances of communicative failures, Paul Grice developed his Cooperative Principle theory, which contains four maxims: *Quantity, Quality, Reaction,* and *Manner* (Plăcintar, 2007; Bara, 2011; Serban, 2011)–refer to (Figure 3) for the explicit rules of each maxim.

Maxims Of Quantity

1. Make your conversational contribution as informative as is required (for the current purpose of the exchange).
2. Do not make your contribution more informative than is required.

Maxims Of Quality

1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

Maxim Of Reaction

1. Be relevant.

Maxims Of Manner

1. Avoid obscurity of expression.
2. Avoid ambiguity.
3. Be brief.
4. Be orderly.

Figure 3: Grice's Cooperative Principle

Grice's Cooperative principle directly depends on the notion of intentionality, in that the interactions between the particular contexts of uttering the sentence and the meaning of expression uttered are of the informative nature with meaning, and not of a ludicrous facility (Plăcintar, 2007; Bara, 2011; Serban, 2011). Although this may be true, ambiguity rears its head every so often disrupting one's interpretation of intentionality.

4.1 Attributes to Conversational Incoherence

Ambiguity is the results when signs, linguistic or otherwise, have multiple meanings or interpretations. Typically, ambiguity is categorized into three different types: *syntactic ambiguity* (structural), *lexical ambiguity* (semantic), and *pragmatic ambiguity* (Das, Kasturirangan, & Sinha, 2015). Syntactic ambiguity results from phrases or sentences that could be interpreted in more than one way depending on their particular syntactic structure; lexical ambiguity correlates to the individual words used, where a single word can refer to multiple meanings; pragmatic ambiguity is when a particular utterance could have several interpretations or could invoke, or involve, presuppositions of different kinds (Das et al., 2015). An example of pragmatic ambiguity, is when one says, "could you pass me the salt", it could be interpreted to either question the participant's ability to pass the salt or their willingness to do so.

Ambiguity can also arise during *indirect speech*–previously hinted to stage 2, *speakers meaning*, in the

five steps of communication–or *nonstandard communication*. There are four cases of nonstandard communication (Bara, 2011):

1. *Nonexpressive interaction*: the use of an utterance without there being any intention to express the mental state associated with that utterance.

2. *Exploitation*: the special use of a communication rule to obtain a communicative effect that is different from that normally associated with that rule (e.g., irony).

3. *Deception*: the attempt to convey a mental state that is not in fact possessed.

4. *Failure*: unsuccessful attempt to achieve the desired communicative effect.

A nonexpressive interaction can be analyzed as either an interruption the speaker intend to interject or as an interruption that come's about within the listener's mind without the speaker intention to do so (Bara, 2011). Bara (2011) expresses that these intentional interruptions can be the speaker's intent to a form of exploitation or of nonexpressive interaction; however, failure comes into play when either the listener does not follow the inferential chain (when he's meant to) or he follows a chain that he was not supposed to.

Exploitation cases are most commonly in the forms of irony. Grice's principle (Figure 3) has formalized the traditional analysis of irony: a trope based on *antiphrasis*, which is an utterance to be intended as its opposite (Bara, 2011; Serban, 2011). Irony is depicted when the speaker produces an utterance that echoes–*echoic* interpretation–another person's thought, while concurrently manifesting a critical or disparaging attitude towards the content of the discussion (Bara, 2011). However, irony fails when the recipient does not understand, either, the duel meaning of the statement or misinterprets that meaning in the unintended way. Deception, as defined in terms of cognitive pragmatics, *is a conscious violation of a shared behavior*. For example, though A knows she should act in a certain way, she carries out a communicative behavioral act that is premeditated to make B believe it is a 'game move' even though she knows full well it is a violation of the game (Bara, 2011).

Deception can arise in two forms, a low level form into order for the user to hide behind temporarily, also known as a lie, and a high level which involves greater meditated planning. For deception to succeed, the deceit must not be discovered by the partner; however if the partner does discovers the deceit, he may either declare the fact or pretend he has not realized it, in order to counter-deceit (Bara, 2011). Unlike nonexpressive or exploitation, deception does not up roar comprehensional confusion; what makes it a nonstandard communication is–looking back to the five stages of communication–that the listener fails to interpret the *true* intended meaning of what the speaker says because of premeditated reasons of the speaker.

Though it seems paradoxical, even a *failure*, in communication, must be agreed upon between A and B or it in turn becomes a failure of communication. There are three types of communicative failure: *noncomprehension*, *misunderstanding* and *refusal*. Noncomprehension is when B fails to understand the expression act or the speaker act of what A is saying, yet B is aware that he has not understood what A is saying (*nonexpressive*; Bara, 2011). Misunderstanding occurs when B fails to comprehend the expression act or the speaker meaning of what A is saying in the way she intended it to be interpreted; misunderstanding fails from B's standpoint, in that, B is unaware that he has failed to understand A's intentions (*exploitation*, irony; Bara, 2011). Refusal is when B understands what A is saying, but refuses to comply with As orientation; this case depends on a conscious decision on Bs part (*deception*; Bara, 2011).

These failures of nonstandard communication depend directly upon B's interpretation, however there are cases where the speaker, A, is at fault for incoherence.

4.2 Self-Correction

In conversation analysis, *self-correction*, or *repair*, is the process that occurs when a speaker recognizes a speech error and repeats what has been said with some sort of correction. With that said, in order to make a repair, the speaker, must first notice some trouble and interrupt his or her flow of speech, and then create a new utterance, which aids the trouble and its potential consequences for the listener (Schegloff, Jefferson, & Sacks, n.d.; Levelt, 1983; Schegloff, Koshik, Jacoby, & Olsher, 2002).

There are three important points worth emphasizing, in regards to conversation analysis: (1) The practice of repair is discursive and interactional, not *cognitive*. Initiating repair is an action or *a move of interaction*; an example of this, is those moments which exhibit some sense display of delay, or hesitation, before the speaker internal decides upon how they wish to resolve the issued (Schegloff et al., 2002). (2) The conduct of "repair" involves an unspoken agreement of both parties–necessarily, excepts to this case are nonexplicit–to stop the current course of action in process, in order to address a trouble/problem of speaking, hearing or understanding the talk; followed by the resuming of communication upon completion of the repair segment (Schegloff et al., 2002). (3) Note in particular the phrase *understanding the talk*, in (2). This is meant to discriminate dealing with problems of understanding the talk (ordinarily the just-preceding talk) from the other problems of understanding (such as, all the case failures of nonstandard communication in section 4.1; Schegloff et al., 2002).

The following three cases defined by Levelt (1983), in which the speaker may engage in self-correction:

- *Do I want to say this now?*
  The speaker may, while speaking, change his mind and realize that he better express another message than the orig-

inal one he was formulating. A common case of this is linearization; if the speaker intends to express some complex state of affairs it is necessary to decide on what to say first, what to say next, etc.

- *Do I want to say it this way?*
  The speaker may, while speaking, become aware that the way he expresses the intended information (idea, concept, proposition) needs qualification in view of the context of expression. This awareness can either be based on the speaker's parsing his "inner speech", and comparing the derived intention to the original one, or the speaker could, alternatively, do the monitoring at the message-level, i.e., testing the message under construction before any verbal communication happens.

- *Am I making an error?*
  When a speaker has no doubts about the idea expressed, or the appropriateness of the formulation, trouble may still arise. A speaker may discover that what he is saying contains an error of some sort, often to his own surprise.

4.2.1 All things considered, self-correction is not a confounding variable that affects the cohesion of communication, in regards the scenario of suspended cognition, since conversational incoherence is directly dependent and occurs solely in the listener interpretant and self-correction does not allow the listener to interpret their utterances incorrectly because repair tends to occur either prior to verbal communication or in the misted.

5. Interpretant-Overload

To ensure the following defining of interpretant-overload does not become misconstrued, key points necessary for understatement shall be briefly reflected upon in a cumulative manner. Subsequently, an interpretant is integral to the sign that imposes meaning on a dynamic object, by employing deictic signs in referring to absent objects; constituting a catalyst for more social, *conventional*, uses to more internal, *imaginative*, ones. Thus an interpretant, engaging in a cooperation to communicate with another, has the capability to interpret and understand the other's thoughts of non-realistic imaginations, as well as perceive new ideas and thoughts of self-expression. However, is there a case when there are too many interpretations to perceive? This is where Millers magic number seven plays an important role. Within section (3.2) we explored how working memory is best when processing seven plus or minus two bits of information at a time; in cases where this average is exceeded, our ability to correctly process information exponential decreases. Following that, we learned about how the five stages of communication, as well as the four cases of nonstandard communication and their failures. With the understanding of working memories capacity, and how communication comprehension fails between two users, we can now explore what exactly interpretant-overload is.

How I define *interpretant-overload*, in layman's terms, is when the syntactically salient sentence is interjected into the conversation, where there is so many variations of interpretations (Peirce's and Bühler's interpretant) that the mental processes exceed working memory capacity (Miller's 7 plus or minus two), thus, in an overexertion of cognitive processing, the conscious brain suspends cognition, or, in other words, presses 'a mental reset' button. As previously defined, to the speaker, these interjections of seemingly syntactic salient sentences may be perceived as relative to the conversation, but for the listener could refer back to *nonexpressive* actions or *exploitation*. These acts of misinterpretations, either verbally recognized (the listener expressing confusion) or internal recognizing (the listener acknowledge the error, yet do not express it to the other–this case could also transform from a failure of communication to deception), are not cases of *interpretant-overload*. Interpretant-overload is strictly regarding the cohesion of lexical perception, and not the result of any third-party outliers (extrinsic variables). I understand that it is impossible for our perception not to subconsciously process our environmental stimuli–as explored in section (2)–however, for an extrinsic variable to incur a redirecting of our attentions, has to be significantly 'loud' enough for our conscious to acknowledge it. Note that this redirection of our attentions is no more than that itself; a *redirection*. To ensure the understanding of such outliers, in the following sections, I shall briefly elude to several cases that could cause misconception.

5.1 The difference between Interruptions and Distractions

Interruptions and distractions fall within the realm of *cognitive control* (also known as *executive functions*), which is a set of cognitive processes–including attentional control (refer to section 2, selective attention), inhibitory control, working memory (refer to section 2.1, Miller), and cognitive flexibility–that are necessary for the cognitive control of behavior: selecting and successful monitoring behaviors that facilitate the attainment of chosen goals (Diamond, 2013). Cognitive control and stimulus control represent opposite processes (i.e., intrinsic vs extrinsic or environmental) that compete over the control of an individuals elicited behaviors (Washburn, 2016), in particular, inhibitory control is necessary for overriding stimulus-driven behavioral response (i.e., stimulus control of behavior).

Though perceptual vast, cognitive control does render conceptual boundaries between cognitive processes, including a definitive line differentiating interruptions and distractions from one another. However the trouble is there are many ways, depending on application, to define interruptions and distractions–in some cases they share similar if not the same definition. For my purposes, I shall define them as follows:

Interruptions are the result of *an extrinsic variable*.

For instance, the intentional interruptions mentioned in section (4.1) about nonexpressive interactions, or other third-party outliers; while,

> Distractions are caused by *the users conscious* selection of attention.

Intentional interruptions supplied by the speaker, still qualifies as an interruption because it was not initiated by the afflicted party (the listener), just as a third-party outlier would have the same affect. In contrast, a distraction is the direct decision of the listener; for instance, if the listeners phone begun to ring, whether to answer it, check to see whose calling or not, there is a brief moment when the listeners attention actively selected to cognitively acknowledge it (i.e., selective attention).

Ostensibly both cases cause discourse within the acts of coherent conversations, however, neither are gaugeable enough to disrupted cognitive processes within the predefined objectives of interpretant-overload. Thereby, both are still a matter of *redirected* conversation; therefore not applicable to interpretant-overload.

5.1.1 Auditory Distraction Auditory distraction is also an element of cognitive control, however unlike our ability to avert from the visual world by closing one's eyes or turning one's head, the auditory organ has no analogous mechanical means of excluding unwanted physical stimulation; therefore the auditory world remains sensuously ineluctable (Macken, Phelps, & Jones, 2009). There are certain adaptively relevant benefits from our incessant registration of the acoustic environment–one can think up several reasons why this is beneficial while in a time of "survival of the fittest", but a more modern example is the cocktail party effect (section 2). However, a by-product of this is that current goal irrelevant information impinges on the organism and may engage obligatory processing to the potential detriment of any focal task (Hughes & Jones, 2003; Jones, Hughes, Marsh, & Macken, 2008; Macken et al., 2009). Studies suggest that the threshold at which noise has behavioral effects occurs depending on the content of the sound(s)–ranging, from 50 to 75 dB(A)–occupied with mental activity, or focal task; resulting in distraction (Jones et al., 2008; Macken et al., 2009). Therefore, according to Jones et al.(2008), "the resulting 'big picture' is rather complex and involved, to the extent that research is converging on the conclusion that there are several distinct varieties of distraction and that even within a variety there are subtle distinction, ones that are perhaps a little arcane but which are nevertheless important to our understanding of distraction." Although this may be necessarily true, what we do know is that the sound needs to be changing in state for disruption to occur, in that the effect of change results in a successful 'attentional capture' (Jones et al., 2008; Macken et al., 2009). According to this view, Jones et al. (2008) purposes that "attention is drawn involuntarily to an event if a mental model of the world of sound is violated: as we experience successive auditory events we build a 'mental model' of its characteristics, by any event that marks a sharp departure from that model commandeers attention away from the task at hand (thereby impairing efficiency)."

Due to the fact that auditory distractions are rather complex and involved, as well as incessantly processing audible information–either provided from an extrinsic variable or the speaker, themselves–it shall be discredited because it can, depending on context, support or oppose interpretant-overload. Consider it as a confounding variable.

5.2 Self-Correction

The following declaration is cited at (4.2.1)–for integral comprehension, refer back to section (4.2).

All things considered, self-correction is not a confounding variable that affects the cohesion of communication, in regards the scenario of suspended cognition, since conversational incoherence is directly dependent and occurs solely in the listener interpretant and self-correction does not allow the listener to interpret their utterances incorrectly because repair tends to occur either prior to verbal communication or in the misted.

5.3 Mind Wandering

Beneath the surface of our everyday behavior flows a stream of spontaneous thoughts, emotions, and memories. These undirected forms of thought are usually referred to as daydreaming, stimulus independent thought, or mind-wandering (Fox, Spreng, Ellamil, Andrews-Hanna, & Christoff, 2015). Be that as it may, the term mind-wandering must not be mistaken as spontaneous forms of thought that are random or meaningless (Fox et al., 2015). In fact, participants reported that, even though the origin of thought are inexplicable, they are strongly related to one's goals, concerns and experiences (Fox et al., 2015). These 'unintentional-intended' thoughts have lead researchers to believe that attention targets exist along a spectrum, where, at one end, targets are encountered in the immediate environment through passive perceptions (e.g., sights, sounds, smells), and on the other end, attention targets active interactions (e.g., physical movements, and tasks); which, when together, form experiences (Rahinel & Ahluwalia, 2015).

In any case, our interest with mind wandering is at which point, within the spectrum, does attention interface with notions of change; change, defined by Ronald Rensink, as the transformation or modification of something over time that is initiated exogenously of the perceiver (Rahinel & Ahluwalia, 2015). In other words, the minimum amount of 'stimulus change' to induce mind wandering. Notions of change can be those of physical objects that engage the perceivable via the modalities: touch, sight, smell, taste, or hearing; in addition to, changes to concept, such as properties or values but these changes in concepts are initially perceived via the senses (Rahinel & Ahluwalia, 2015). With that said, this

notion of change is distinct from that of *difference*, where variation along some dimension between two stimuli exists at a given point in time; change entails a single stimulus that exhibits a form of temporal variation (Rahinel & Ahluwalia, 2015).

Although all researchers agree that mind wandering is associated with measures of working memory, there is still some discrepancies between the implication of this relationship. That, either, working memory processes are involved in the mental activity of mind wandering itself, or that working memory is more closely related to the control processes engaged in getting the mind back on track (Rahinel & Ahluwalia, 2015). For which ever case one chooses to pursue in, mind wandering is not considered as an interpretant-overload because when one experiences mind wandering, in the case of conversation, when the recipient experiences a 'wander', upon becoming conscious of it, they are aware that any confusion they may be experiencing is the result of their minds slipping. That being the case, mind wandering is not a formidable counter argument for dependent variables.

6. Suspended Cognition

We all have experienced when our train of thought derails and fails to recover. To explain this cognitive phenomenon of Suspended Cognition, we first explored several theories of attention: selective attention (directed attention), bottleneck models, and the cocktail party effect, which eluded to George Miller's magic number seven framing the spans of absolute judgment, in addition to the capacity of working memory; that as bits of information increase, our ability to confidently confirm knowledge decreases. Acknowledging these limitations of our environmental cognitive processing, plays a crucial role, in that our subconscious internalizes all perceptual information but forces us–the users–to focus on seven plus or minus two chucks of information at a time; in an effort too seamlessly interpret the world. I use 'in an effort' purposefully because there are moments when our cognitive reasoning fails us; such as, suspended cognition.

Accordingly, we took a closer look at Pierce's and Bühler's interpretant, as well as their PBI conflux. In that Pierce's addition of dynamic objects, and his insistence that the interpretant is integral to imposing meaning onto the sign. Plus, Bühlers *deixis am phantasma* deictics which refer to no object in the 'here and now', but to a mental image or memory of the object; subjective perceptions and culminated dreams. Together we experience the Pierce–Bühler Interpretant (PBI) conflux, which states that the interpretant's perception of meaning is strictly dependent on the interpretants prior experiences, in addition to their perception of representative meaning is not limited to the laws of reality but rather limited to the interpretants culminated fantasies and dreams. The PBI conflux is so important because it now accounts for humanities abilities of imagination (such as, the example of the pink elephant), as well as our initial subjective individual perspective's (such as, double meanings and fuzzy boundaries). Without this conflux, an interpretant, engaging in a cooperation to communicate with another, would not be capable of interpreting and/or understanding the other's thoughts of non-realistic imaginations, new ideas and thoughts of self-expression, or, in the worst-case scenario, lexical word-play.

Sequentially, we then investigated some principals of conversation; like the five stages of communication that explored the internal process that occurs prior, while, and post the instigation of another, in addition to the possibilities of cooperative failure. To which Grice's Cooperative Principle attempts to limited the threshold of failure with his four maxims: Quality, Quantity, Relevance, and Manner. Unfortunately, Grice's Maxims cannot account for ambiguity and its four cases of nonstandard language: *nonexpressive*, *exploitation*, *deception*, and *failure*. It is here, where Miller's magic number plays an important role; is there a case when there are *too many* interpretations to perceive from a syntactically salient sentence?

Thus, leading into what exactly is an interpretant-overload, henceforth defining it as the interjection of a syntactically salient sentence into a conversation, where there is so many variations of interpretations (PBI conflux) that the mental processes exceeds working memory capacity. With attention to exploring several cases that could have potentially been mistaken as interpretant-overload; namely the differences of interruptions and distractions, auditory distractions, self-correction, and mind wanderinghowever with further examination prove to have no affect or influence on interpretant-overload.

With all of this in mind, we can now effectively theorize that Suspended Cognition is the resultant of the interjection(s) of a syntactically salient sentence(s)–which hold(s) zero integrity to the conversation, in the perceptive of the listener–where there is so many variations of interpretive meaning (PBI conflux) that the mental processes exceed working memory capacity (Millers magic number), causing an interpretant-overload. Thereby an overexertion of cognitive processing, in which the subconscious brain responds to by pressing "*control alt, restart*" to all working memory processes, thus suspended cognition.

Cognitive suspension that is not inflicted by a third party or outlier, because the interpretant-overload developed strictly from the cohesion of a syntactic perception interpretation. Moreover, this development of suspended cognition occurs *solely* within the perspective of the listener; the one interpreting meaning from the phonematic utterances of the speaker. Emphasizing, that conversational incoherence is at fault from a *syntactically salient sentence*, meaning that the speaker did not utter some formality on par with 'mumbo-jumbo' or an inebriated slur.

In any case, Suspended Cognition, even at it's best, is still susceptible to oppositional discrepancies.That being said, those who dismissively annul any or all practicalities of suspend cognition, are unable to grasp the enormous potential hidden within it's core. These discrepancies, in the right

hands, could adroit from pinhole confoundments into admeasurable opportunities that manifest further our cumulative understandings of humilitive cognitive processes.

CoGNiTiVe ScIeNcE

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"The wall outside my house is not four foot tall."

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