

Original Article:

**HOW TO ORDER A BABY:
CONFUSIONS AND CONSTRUCTIONS OF A LITTLE
SCIENTIST IN THE FREUDIAN WORLD**

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Abstract

Abduction is a form of reasoning posited by Charles Sanders Peirce. It is the most relevant reasoning process within the developmental framework. Abductive reasoning is an epistemological process that allows for the production and alteration of hypotheses and beliefs due to the continuous dialogue between the particular and the general. Abduction is bounded reasoning in which induction, deduction, and hypothesis construction are interrelated within the reasoning process. By combining the Peircian and Freudian models, the process of abductive reasoning can be clarified and extended. Peirce (1887) describes beliefs as premises for actions. The relationship between beliefs and actions of an individual sets the foundation for the abductive reasoning process in everyday inquiries. Freud (1908) described a child's action in the search to solve the riddles of childbirth. Using Freud's study on the sexual researches of children, this paper will examine the intricate microgenetic processes associated with abductive reasoning, and the developing beliefs that result.

Keywords: Abduction, Deduction, Induction, Belief,
Freud, Hypothesis, Peirce.

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When his mother called for him to stop playing and for him to come eat, he sat, wrapped in a towel, basked in the sun, and stared at his mother's physical increase in size (a result of the pregnancy). The child broke the silence as he suddenly burst out, with no awareness of volume control, and asked loudly, "Mommy, where do babies come from?" The child's mind must have been contemplating an explanation by utilizing reasoning that only resulted with inadequate partial answers to the question at hand.

His mother smiled and blushed. She hesitated for a moment, indicating her preparation of an age-appropriate explanation. Within a minute the mother said softly, "Remember how Santa climbs down the chimney to drop off presents on Christmas Eve? Well a giant stork drops the baby off at the front door!" The child continued to sip some apple juice through a straw and took one more bite of a cracker. He appeared to be assessing the answer given to him. "Do you order it?" the child asked after a minute. "Absolutely," The mother replied, "when two people who are married decide it's the right time."

INTRODUCTION

It is extraordinary to realize that individuals pass through their lives, not noticing the vast amount of beliefs and thoughts they construct, destruct, and reconstruct. Imagine all the thoughts an individual has in a single day, in a single hour, or even in a single minute. Individuals are not aware of the process of thought as it unfolds in everyday practices. They do not consider the process by which beliefs change. They do not consider the exchange between the daily experience, and the internal thought and belief.

In this paper I seek to investigate the development and change of thoughts and beliefs through the process of abductive reasoning. This paper will then consider the results of the investigation through a Freudian framework—that is, by applying the results of the investigation to Freud's theory of children's sexual researches. Modes of inference such as deduction and induction are non-developmental, and as such do not allow for the inclusion of developing, transitioning, and unfolding phenomena. Abduction is a developmental process that makes such phenomena possible. Abduction, then, must allow for a continuous and ontological dialogue between the particular experience and the general beliefs about the world. This dialogue requires the bounded functions of induction, deduction, and hypothesis construction. Without these key parts, abduction could not function. Abductive induction allows for the generalization of the particular experience to the abstract domain, from which a hypothesis is constructed. The resulting hypothesis is

known as the abductive hypothesis. The abductive hypothesis is applied from the abstract domain to the particular experience by abductive deduction.

Abduction is the process by which beliefs form and develop. By looking into a theory of beliefs by Peirce (1887), the foundation of abductive reasoning and belief development can be illuminated. The process of abductive reasoning and belief development will then be illustrated through the use of Freud's (1908/2007) writing on children's sexual researches. Using Peirce's illumination of the foundations of abductive reasoning, and illustrating the processes of abductive reasoning through Freud, this paper will examine the intricate microgenetic processes associated with abductive reasoning, and the developing beliefs that result.

Peirce and the Guiding Principle of Belief

Beliefs are the premises from which individuals act. But beliefs are also the phenomena that construct our axiomatic understanding of the world. Therefore, beliefs are not just premises for individual action, but are also premises for the social sciences. Beliefs are how we make sense of the world and constitute our assumptions about the phenomena in the world. Consequently, there is no differentiation between the individual who is setting out to understand a personal question and the social sciences that research the practical problems of their time. Whether it is the individual or the social sciences as a whole, the axiomatic understanding of the world is constructed on beliefs. Therefore beliefs are important phenomena to study in relation to abductive reasoning—an ontological reasoning and research process that alters (or fixes) beliefs.

In 1887, Charles S Peirce wrote an essay titled *The Fixation of Belief*, in which he comments on beliefs as premises that guide our possible future actions. Peirce (1887) says, "Our beliefs guide our desires and shape our actions" (para. 14). According to Peirce, the actions that can result from a set of beliefs are multiple. Therefore, belief is a condition that dictates many possibilities of action. He writes that the relationship between belief and action is that, "Belief does not make us act at once, but puts us into such a condition that we shall behave in some certain way, when the occasion arises" (Peirce, 1887, para. 16). Consequently, belief is a metaphysical and metapsychological set of premises in the mind that dictates the individual's possible behaviors in certain conditions. Belief is a guiding principle, not a causal principle.

Belief as a "guiding principle" is quite important. It does not only guide individual actions, but also guides the research process of the social sciences. Beliefs will dictate not only how we understand the world (as well as the phenomena in it) but also the methodology used, the theories constructed, and the data interpreted (Valsiner, 2007, p. 364). It is quite important, then, that a full account of the phenomenon of belief be utilized.

When belief no longer applies to the everyday experience, doubt arises. Doubt is one of the many emotions that begin the developmental process of belief formation and belief alteration. Peirce (1887) writes, "The irritation of doubt causes a struggle to attain a state of belief. I shall term this struggle *inquiry*" (para. 17). "Inquiry" implies an unfolding "search" or "process" by which the individual seeks for belief development. The individual may alter their belief, or change it entirely, based upon its *validity*—the applicability to the everyday experience.

When the individual engages in a dialogue of inquiry, the goal is to quell doubt by solidifying a valid belief. The discrepancy between the existence of an old belief and the search for a new (or altered) belief is one of opinion. Whether a belief is valid depends upon whether or not the belief is completely applicable to relevant experiences. There are no objective criteria for such applicability. According to Peirce-- "With the doubt, therefore, the struggle begins, and with the cessation of doubt it ends. Hence, the sole object of inquiry is the settlement of opinion" (Peirce, 1887, para. 18). The object of inquiry then is not about truth, but about a completeness and utility.

Doubt, inquiry, and validity are all terms used not only for the individual, but also the research process of the social sciences. The difference is that the social sciences seek to find what is true—not necessarily what is complete and usable like in the individual case. If social theories no longer fit in explaining the phenomena, or if recent developments fit better than older social theories, then the beliefs (or the belief system) must change as well. The relationship between research and beliefs begins to become clearer.

Completeness and utility in belief formation still have a relationship with truth. Beliefs that complete a mental framework and can be utilized in relevant daily experiences must have some degree of truth, even if it is only a perceptual truth. Peirce (1887) writes, "The most that can be maintained is, that we seek for a belief that we shall *think* to be true. But we think each one of our beliefs to be true, and, indeed, it is mere tautology to say so" (para. 18). Beliefs that we think to be true may sometimes be false. Even the occasional belief that is built upon false premises can complete the mental framework and still be utilized in experience. At this point, "For as soon as a firm belief is reached we are entirely satisfied, whether the belief be true or false" (Peirce, 1887, para. 18). But false beliefs are to be expected. Especially for those children who do not have the means to objectively or academically justify their belief formations. This does not mean they will never develop the "correct" or "true" belief.

Individual belief dynamics then is an ongoing and ontological process in which there is a constant inquiry into a personal framework that explains the surrounding world sufficiently. Social science is no different. Social science (re)searches for the answers to unanswered questions about the world. But the truths that they hold to be fixed may not be. Social sciences (as is the case for all fields of research) have had their share of

incorrect theories and approaches. But it is the ongoing and ontological process of belief development, which allows for changes in understanding the world around us.

Developmental Notions

Development is a constant in the existence of phenomena, and beliefs are no exception. Consequently, beliefs cannot be studied solely "as-they-are". Instead, beliefs must be studied in conjunction with two other frameworks: the belief's historical emergence and the belief's future becoming. The former studies the developmental emergence of beliefs "as-they-were" to "as-they-are". The latter studies the developmental becoming of beliefs "as-they-are" to "as-they-will-be". As a result, all belief-based disciplines, such as the social sciences, must study beliefs "as-they-were", "as-they-are", and "as-they-will-be" in order to achieve an accurate developmental analysis. The following paper will study the emergence and becoming of beliefs through the developmental notions of "as-they-were", "as-they-are", and "as-they-will-be".

Developmental processes of belief formation and alteration can be analyzed in three area-specific domains: macrogenetic, mesogenetic, and microgenetic (Valsiner, 2007, pp. 301-2). Macrogenetic analysis studies ontogenetic (life-course) development. Mesogenetic analysis studies development in "situated activity frames, or settings" (Valsiner, 2007, p. 302). Microgenetic analysis studies development from moment to moment. Although the scope of developmental analysis may differ, there is a relationship that exists between all three layers. For example, traumatic microgenetic events can have an impact on activity-based or life-course development (Valsiner, 2007, p. 303). In order to obtain the most intimate and descriptive detail of development, a microgenetic analysis must be utilized.

Microgenetic Analysis

Microgenetic analysis studies the emergence and the becoming of beliefs by treating different developmental forms of beliefs as "boundary-states" (Abbey & Diriwächter, 2008, p. xii). Beliefs develop in a sequence of mutually interdependent forms/boundary-states. Microgenetic methodology considers the in-between forms of phenomena as more important than the initial and final states. If the in-between or intermediate forms are not studied, then the initial and final states are of little developmental relevance, either alone or in relation to one another. Therefore, microgenetic development is not a developmental sequence of independent states (see Model 1 in Figure 1), but rather an interrelated sequence of forms (see Model 2 in Figure 1) (Valsiner & Van der Veer, 2000, pp. 304-5). How can one overcome the

methodological pitfall of studying development through independent states? One option is to study the microgenetic unfolding of beliefs.

Figure 1. Different Models of Development

Development through independent states:

Model 1: Initial State A → B → C → D → Final State E

The developmental model of independent states posits separate and discontinuous “stages” or “states” that we develop in. Development starts off in some initial state (A), develops into the next state (B), followed by development into the following state (C) and so on and so forth until the final state has been reached (E).

Development through an interrelated sequence:

Model 2: Initial State A → Ab → B → Bc → C → Cd → D → De → Final State E

The developmental model of interrelated forms posits that development is continuous and related. That is to say, each form (Ab) in the developmental sequence is an intermediate of the previous developmental form (A) as well as the developmental form that is to follow (B) and is in the process of developmental becoming.

Microgenetic Methodology

Microgenetic methodology is chosen as the method of analysis in this paper because microgenetic traditions account for “psychological experiences” (Diriwächter, 2009, p. 348). As discussed previously, it is the intuitive experience that influences the construction of belief, and as a result, the construction of the research method, theory, and data that follow. The experiential processes associated with abductive reasoning—belief formation, hypothesis construction, and dialogue between particular experiences and general concepts—are not static entities, but dynamic experiential processes. Therefore, an “outcome-oriented” method will be insufficient (Diriwächter, 2009, p. 319). The process of abduction, and its aforementioned psychological content, should be studied through “their experienced and developing forms” (Diriwächter, 2009, p. 320). There is no one-to-one causal connection (isomorphism) between a stimulus and the unfolding development of the mind (Diriwächter, 2009, p. 322). It would be inaccurate to study the phenomena of unfolding beliefs, hypotheses, and thoughts through quantitative methods. The following study does not look for the degree of a statistical relationship

between variables in psychological development, but rather studies the quality of the unfolding process.

Unfolding and Adapting: Beliefs, Hypotheses, and Thoughts

The inner dynamics of the mind are constantly in a state of developmental unfolding. Beliefs, hypotheses, and thoughts are all forms of information that must unfold as they constantly (pre-)adapt. The adaptation of mental phenomena warrants the development of information from the previous context to the current context. Pre-adaptation of mental phenomena warrants the development of information from the current context to the imminent but unknown future context. Whether adapting or pre-adapting, the information within the mind is always developing. Piaget (1923/2002) says that,

It is adapted information, moreover, that gives rise to dialogue. The dialogue of children deserve to be made the object of a special and very searching investigation, for it is probably through the habit of arguing that, as Janet and Baldwin have insisted, we first become conscious of the rules of logic and the forms of deductive reasoning.
(p. 20)

Assimilated and accommodated information is always (pre-)adapting and therefore is always developing. Piaget is correct in stating that the adapting dialogue of children deserves investigation, as they know less of the world, and as a result search for more answers. But, in order to understand the child's general knowledge construction process, one must understand the child's method of reasoning. Piaget is only partially correct in referencing the logic of deductive reasoning. The following paper will investigate such knowledge development, and furthermore belief development, through the process of abductive reasoning.

Non-Developmental Modes of Reasoning

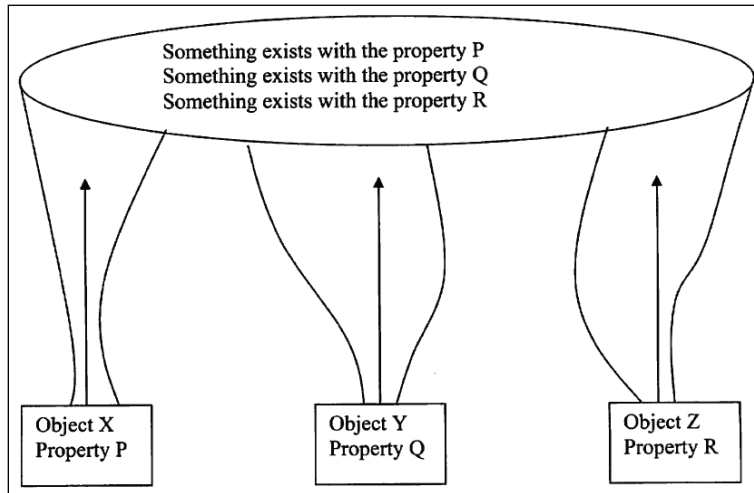
If beliefs, like most phenomena, are developmental, then how can the individual or the sciences conclude anything with non-developmental forms of reasoning? In mainstream social sciences (such as psychology), induction and deduction are portrayed as the main types of reasoning. Inductive reasoning—moving from the concrete specimens or individual data to a general rule or principle—and deductive reasoning—taking a general rule and applying it to the individual specimen—are acknowledged as reasoning processes, but do not fit within the developmental framework (Valsiner, 2007,

pp. 278-80). Inductive and deductive reasoning, as separate processes, do not explain the continuously changing beliefs and hypotheses constructed throughout the life course. Inductive and deductive reasoning also have trouble overcoming the barriers of developmental notions such as the becoming and the emergence of phenomena. Therefore, this paper attempts to explain the reasoning process that allows for the dialogue between the particular and the general as well as the developmental result—altered hypotheses/beliefs.

Developing the Notions of Induction and Deduction

The two modes of reasoning—induction and deduction—are static notions. They do not change over time and therefore are not developmental. They do not present room for fuzzy conceptions, or ambiguous notions. If one looks at inductive reasoning, then object X has the property P, and by some means of reasoning, one can conclude that something exists with property P (see Figure 2).

Figure 2. Inductive Reasoning



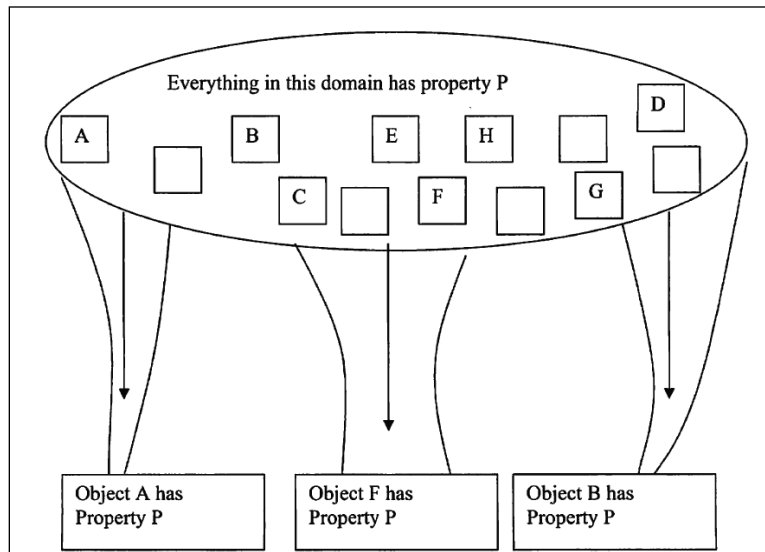
Object X exists with property P. We can make a generalized statement by abstracting property P. Through inductive reasoning we can conclude something exists with the property P. Object Y exists with property Q. We can make a generalized statement by abstracting property Q. Through inductive reasoning we can conclude something exists with the property Q. Object Z exists with property R. We can make a generalized statement by abstracting property R. Through inductive reasoning we can conclude something exists with the property R. Abstracting particular properties P, Q, and R from their corresponding objects X, Y, and Z to the generalized domain is inductive reasoning.

Developmentally speaking, this is unrealistic. If object X has property P, and is in the process of transitioning to object Y with property Q, then by no means can one reason that something has the property P, and by no means can one reason that something has

the property Q. The object is most likely transitioning microgenetically from X to XY to Y and therefore has a mix of properties along the spectrum of P to PQ to Q.

Deductive reasoning produces a similar problem of application in the developmental domain. By using deductive reasoning, one can conclude that everything in a domain has a particular property of the domain. For example, everything in a particular domain has the property P. If object X falls in this domain, one can reason that object X has the property P (see Figure 3). Developmentally, this line of reasoning fails as well. Assume everything in domain A has the property A and everything in domain B has the property B. Object X is in domain A AND in domain B due to a transitional unfolding process. The object is developing from an object in domain A to an object in domain B. One cannot reason by deduction that the object has the property A and one cannot reason by deduction that the object has property B. It is suspended in transition and therefore has a unique combination of properties A and B, of which there are infinite possibilities of property mixtures.

Figure 3. Deductive Reasoning



All objects within a domain share the same property. Objects A through G exist together in some domain—domain P. All objects in domain P share the property P. Therefore, if object A is picked from the domain, we can conclude that it has property P. The same reasoning process follows for objects B, C, D, E, F, G, and H. Deduction is the application of the general property P to the particular objects A, F, and B that fall within the same domain (Domain P).

The Answers of Abduction

The process of abduction, originated by Peirce, solves the answer to the search for a developmental reasoning process. Peirce (1901, as quoted in Pizarroso & Valsiner,

2009, p. 10) comments on abductive reasoning and its developmental origin when he says,

Neither deduction nor induction can ever add the smallest item to the data of perception; {...}. All that makes knowledge applicable comes to us via abduction. Looking out my window this lovely spring morning I see an azalea in full bloom. No, no! I do not see that; though that is the only way I can describe what I see. That is a proposition, a sentence, a fact; but what I perceive is not proposition, sentence, fact, but only an image, which I make intelligible in part by means of a statement of fact. This statement is abstract; but what I see is concrete. I perform an abduction when I so much as express in a sentence anything I see.

The process of abductive reasoning is the most accommodative and the most developmentally relative form of reasoning. In the quote above, Peirce illustrates the development of his perception and the back-and-forth mediation between the abstract and the concrete. This continuous dialogue is what allows abductive reasoning to be an ontological process. Life-course reasoning results in the constant production and alteration of hypotheses and beliefs. Consequently, abductive reasoning is founded within the developmental framework as a result of the continuous dialogue of the particular with the general, the concrete with the conceptual, and the microgenetic experience with the macro-level organizer.

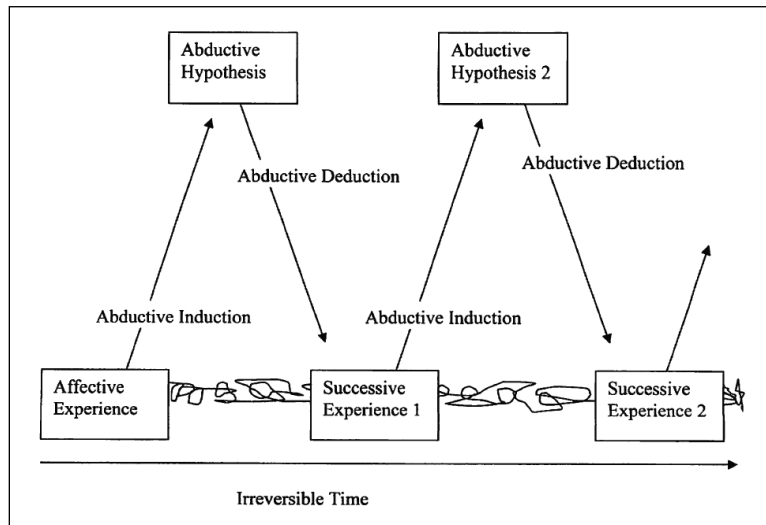
Abduction is a bounded reasoning, which includes the interrelated processes of induction, deduction, and hypotheses construction. All three parts are not only co-definitive but also co-relational. The quality of co-definition suggests that abduction is defined as a whole by the individual functions of induction, deduction, and hypothesis construction. The quality of co-relation suggests the relatedness of the function between each individual process within abduction as a whole. Therefore, abduction does not occur without inductions' ability to generalize a hypothesis and deductions' ability to apply it. If one of the corresponding processes is taken out, then abduction as a whole vanishes. To emphasize the embedded nature of inductive and deductive functions in the abductive process, they are named: *abductive induction*, *abductive deduction*, and *abductive hypothesis*.

The Process of Abduction

Abductive reasoning starts with a research problem. Research problems are constructed from experiences that elicit an overwhelming amount of feelings perceived by the individual. Affects and feelings are feel-forward processes and consequently organize cognition and behavior in the present, as well as pre-adapting the self to the

future (Valsiner, 2007, p. 63). Therefore, these “feeling-forward” processes construct a research question from the research problem. This research question gives abductive reasoning processes direction. The goal of abductive reasoning is to answer the research question by the means of gathering and collecting masses of information. The collection of information provided by microgenetic experiences allows the individual to execute *abductive induction*—the process of abstracting and generalizing notions of the concrete experience to the theoretical notions of the meta-level. This meta-level provides the construction of the *abductive hypothesis*—a meta-level hypothetical (or theoretical) answer to the initial question. The abductive hypothesis is synonymous with a *belief*. However, the individual does not stop developing and experiencing. As a result, the individual will apply the meta-level hypothesis to the next relevant experience via abductive deduction. *Abductive deduction* is the application of the meta-level hypothesis to the concrete experiences of everyday life. The process of abductive reasoning—abductive induction, abductive hypothesis, and abductive deduction—continues within irreversible time (see Figure 4). Therefore as development occurs, knowledge is constantly reconstructed and revised dependent upon the experiences the individual is situated within.

Figure 4. Abductive Reasoning

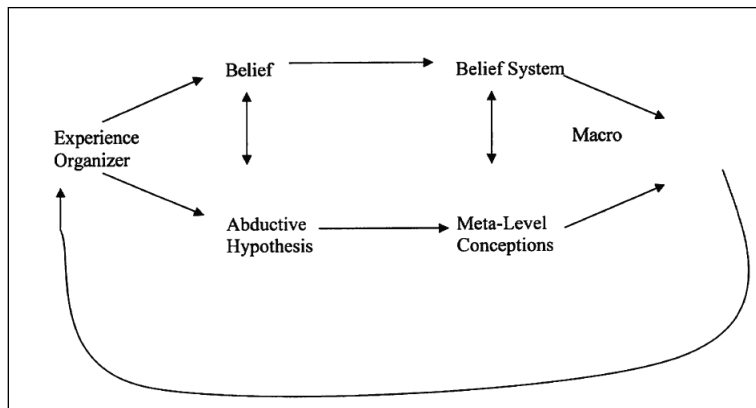


Abduction begins with an experience that is “impactful”. That is to say, the experience evokes an affective response—strong feelings. This is called an affective experience. This experience undergoes abductive induction—a generalizing and abstracting process—in order to construct an abductive hypothesis. This abductive hypothesis is applied to a following concrete experience. This is identified as the successive experience 1—the first experience (after the original affective experience) that the abductive hypothesis can be applied to. The abductive hypothesis may not completely apply. Therefore, feedback is given to the hypothesis but abductively inducing the information experienced and learned. The abductive hypothesis then becomes altered, and is applied to yet another experience—the second following experience. This process then continues throughout the life course. Abductive reasoning is the continuous process of (a) generalizing from an experience in order to (b) construct a hypothesis that is then (c) applied to the next successive experience.

Bounded Beliefs

There is a relationship between the process of abduction and belief formation (see Figure 5). The process of abduction (specifically abductive induction) results in the construction of a hypothesis. When multiple abductive hypotheses exist simultaneously they become an amalgamated whole. This amalgamated whole is a constructed *meta-level conception*. When the meta-level conception is reinforced and becomes dominant (dominating the different behavioral or cognitive facets of life) it takes the function of a *macro-organizer* (Josephs & Valsiner, 1999, p. 102).

Figure 5. Relationship Between Abductive Reasoning and Belief Organization



A relationship exists between the abductive reasoning process and belief organization of the individual. Both abduction and belief organization begin with the phenomenological experience. Individuals then construct their beliefs about the world based on their experience. The same is with the abductive hypothesis. In fact, a belief is very similar to an abductive hypothesis, since both are premises for action, and both are tested in following experiences in the life course. Multiple beliefs form a belief system. Multiple abductive hypotheses form meta-level conceptions. These too are analogous. A belief system is used as a “frame of mind” that individuals view the world through. Meta-level conceptions are the same—conceptions that provide a framework for action and thought. Belief systems and meta-level conceptions, when concretized, become macro-organizers, which then regulate the following life-course experiences.

This is the same process of belief formation. Abductive induction will generalize the concrete experience resulting in a belief. When multiple beliefs exist simultaneously within the mind, a belief system is constructed. This belief system can become dominant, resulting in the construction of a macro-organizer. The parallel construction processes in abductive and belief formation both result in macro-organizers. Both processes deal with the continuous dialogue between the concrete experience and the meta-level macro-organizer.

A macro-organizer is best described by Josephs and Valsiner (1999) when they write,

These are obviously or implicitly evaluative and moralistic ('you should; you should not'). Macro organizers operate on a more generalized semiotic level, depicting convictions, rules, worldviews, and the like, which can be self- or object-oriented. They guarantee stability, continuity, and predictability of one's attempts to make sense of life [...]. Macro organizers are rather stable and resistant to change. Once developed, they operate as rigid generative processes which lead immediately to an infinite number of applications and specifications, all of the same kind and in the same direction. (p. 102)

Ontological macro-organizers are self-maintaining and self-reinforcing. Self-reinforcing suggests the integrated information via abductive induction is actually in agreement with current beliefs. Self-maintaining suggests that the abductive deductions from the belief to the unfolding experience fit accordingly. There is no reason to change the belief, and therefore no reason to change the belief system. Consequently, this self-maintaining and self-reinforcing nature perpetually solidifies the belief system for ontological use.

Abduction is no doubt the main method of self-development. The individual seeks to fill in gaps of knowledge, to answer questions, and to complete the Gestalt of their lives. Abduction is the only reasoning that takes into consideration developmental processes and transitional phenomena. *Abduction allows for the ability to guess, assume, and extract from the concrete experience to the generalized domain, and then apply this newly created meta-level notion to the next particular experience.* It is by this process, the investigation of the Freudian world begins.

The Little Scientist and the Research Process

To Freud, children inquire about "sexual problems" before they reach puberty (Freud, 1908/2007, p. 224). However, the notion of "sexual problems" can be easily misconceived—that is, the notion of "sexual problems" does not allude to failures or disruptions in sexual function. Instead, Freud's notion of "sexual problems" is analogous to the social science's notion of "research problems". Freud's (1908/2007) essay *On the Sexual Theories of Children* has two functions: (1) to advance his theory of a developmental infantile sexual life and (2) to allude to the metaphor of the child as a "researcher" within the sexual domain. The purpose of Freud's essay within this paper is to emphasize the latter—the child as a researcher. The parallelism between Freud's conclusion of children as sexual researchers and the previously discussed notion of abductive reasoning in the research of the social sciences is of an illuminating quality. Therefore, it is the goal of this section to highlight and emphasize the process of

reasoning through a child's investigation of childbirth in hope that it advances the understanding of how the abductive process unfolds.

The Drive For Knowledge

The goal of the research process in any field of the social sciences is driven by the search for knowledge—that is, to solve the unanswered questions of life. According to Freud, the same applies to the child's research process. The child strives to answer the unanswered questions of life, or more specifically, of sexual life. Freud believes that the child's research drive—also known as the knowledge drive—begins to flourish around the same time the child's sexual life begins to develop. Freud (1905/2007) says that,

The same period in which the child's sexual life reaches its first blossoming, from the third to the fifth year, also sees the beginning of the activity attributed to the drive to knowledge, or the research drive. The drive to knowledge can neither be counted among the elementary drive components nor placed exclusively under the heading of sexuality. On one hand its action corresponds to a sublimated aspect of mastery, while on the other it works with energy derived from the love of looking. Its relations with sexual life, however, are particularly significant, for psychoanalysis has taught us that the drive to knowledge in children is drawn with an unsuspected precocity and an unexpected intensity to sexual problems, and indeed it may be awoken by those very problems. (pp.169-70)

It is the association between the research drive of children and the awakening of sexual life in children that is most interesting to Freud. Freud believes that children's drive for research and knowledge is not completely sexual, but also not free from it. For example, Freud writes that the drive to research may end up in knowledge that aids in the child mastering the environment, but the process begins from the presentation of "sexual problems" (Freud, 1905/2007, p. 170).

Research is Me-Search

Many research processes focus on one question to answer—the research question—that develops from a research problem. But how does this question come about? For Freud, the research problems of children are sexual, and therefore it is the "sexual problem" that constructs the research question and the eventual research process. In the social sciences it is the same. Some social problem is presented out of which the research question emerges.

The research process of the social sciences and the infantile sexual researches of the child are both practical researches. Most research in the social sciences are for practical reasons—whether it be a practical problem, or results for practical use. Infantile sexual researches are of the same quality. Freud (1905/2007) says,

Practical rather than theoretical concerns set the child's research activity in motion. The threat, experienced or expected, to the child's conditions of life as a results of the arrival of a new child, and the fear associated with the loss of care and love associated with that event make the child thoughtful and alert. (p. 170)

For practical reasons, then, the child becomes a little scientist and searches for knowledge related to a sexual problem. A sexual problem is an experience (or expectation) of threat, fear, or any other feeling of an overwhelming or detrimental quality that somehow relates to the sexual domain. In Freud's quote above, this threat and fear is associated with the arrival of a new child. Childbirth is a sexual (and I would add sensual) topic, and falls within the sexual/sensual domain.

Research based upon the researcher's affected experiences and expectations of being affected is not far from the common cliché of research—that "research is me-search". It is possible that actual social scientists research phenomena that have affected them in some way, shape, or form. At the very least, social scientists may study phenomena that are interesting to them. Freud (1908/2007) puts this concept nicely in relationship to infantile sexual researches when he writes,

Children's urge for knowledge in this area does not awaken spontaneously, out of an innate need for causality, for example, but is spurred on by the id-controlling drives, if [...] those drives are affected. (p. 225)

With this quote in mind, it can be concluded that the research process is a type of practical research that allows the researcher to better understand phenomena that have affected the researcher at some point or another (or are expected to affect him in the future). Therefore it is from the researcher's experiences (during which he was somehow affected) or expectations (in which he anticipates being affected in the future) that create the research problem. From this problem, the research question is created. It is from this point, when the research question has been proposed, that the research process takes off. The research process strives to produce knowledge—particularly knowledge related to the research problem and research question—through the means of abductive reasoning.

Developing the Answers: A Child's Constructions of Childbirth

The parallel between research in the social sciences and the infantile sexual researches is quite illuminating. Therefore, by illustrating the use of abductive reasoning within the scope of Freud's writing on infantile sexual researches, the practical utility of abductive reasoning in the research process will become transparent—whether it be individual research, or research of the social sciences.

To Freud, the child is affected somehow by childbirth and pregnancy, which awakes the investigative drive for research and knowledge. Freud (1905/2007) says

The first problem that the child deals with, in accordance with the story of the awakening of this drive, is not the question of sexual difference, but the riddle: Where do children come from? (p. 170)

In Freud's example, the child is affected by the imminent birth of a new sibling (Freud, 1908/2007, pp. 225-6). Thoughts and feelings associated with the future sibling can affect the child in many ways. Freud talks about the "changing of nurseries", the "changing of rooms in preparation for the new baby", and the "loss of parental devotion and caring" (Freud, 1908/2007, p. 225). All of these events have some effect on the child before the sibling has been born. Specifically, the loss of parental devotion due to the new sibling and all its associated material becomes the research problem, or to Freud, the sexual problem.

1.) *Research Problem:*

Loss of parental devotion due to new-sibling pregnancy.

Searching for Siblings

The research problem described by Freud is an indirect signal to the child of an imminent change in family dynamics. This change affects the egocentrism of the young child. This signal is highly impactful since there is an ambiguous nature as to what the change *is* and what the change *will become*. This will "have an awakening effect on the child's emotional life and sharpen its ability to think" (Freud, 1908/2007, p. 226). Consequently, the child starts looking for an answer to the question of *what is to come of these changes?* This question is the result of the need to construct meaning and knowledge from the experienced problem and the expected future problems that result. Eventually, the child discovers the reason for a changing environment. The child is told that they will soon have a new sibling. The research process begins, and the child sets out to understand what, why, and how this has come to be. Freud (1908/2007) writes that,

Stimulated by these feelings of concern, the child comes now to occupy itself with the first great problem of life, and asks itself the questions *where has children come from*, a question which probably means initially: where has this individual, upsetting child come from. (p. 226)

Freud illustrates how the research question "Where do children come from?" emerges from the research problem (Freud, 1908/2007, p. 226). The process of abductive reasoning begins as the main method of reasoning in the research process. The infantile sexual research has a goal—to find out where children come from.

The child starts "working as an autonomous investigative drive" (Freud, 1908/2007, p. 226). The first method children use to investigate is asking their parents. Children may ask, "*Mommy, Daddy, where do babies come from?*"—an all too familiar phrase parents hear. The parents are a usual means by which the child acquires knowledge. The child also identifies the parents as the source of "all-knowing" (Freud, 1908/2007, p. 226). Parents or parental figures have taught the child a lot of what they know, and consequently the child goes to these knowledgeable figures for answers to the childbirth question(s).

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
| 2.) <i>Research Question:</i> | Where do babies come from? |

Parents, upon hearing the question, can become flustered by their anxiety to construct the appropriate response (as dictated by society, culture, and historical time period). The parents will reprimand the child, become evasive, or end up presenting the child with a myth-like story. Myth-like stories serve the function of an "age-appropriate" explanation. Age-appropriate responses are defined in this paper as providing an answer that will satisfy the child without introducing ideas of an explicit sexual nature (since Freud implies that most parents believe that children are too young and innocent to hear sexual explanation) (Freud, 1908/2007, p. 227). A common example of a myth-like story is that a stork will deliver the baby. The child has now had its first most relevant experience to answer the question where babies come from.

This experience is generalized through abductive induction to the meta-level. The child has assimilated the knowledge that a stork will deliver the sibling. Abductive induction generalizes this to the meta-level in order to construct the abductive hypothesis that, "*Babies come from the delivery of the stork.*"

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
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| 2.) <i>Research Question:</i> | Where do babies come from? |
| 3.) <i>Experience:</i> | Parents tell the myth-story of the stork. |
| 4.) <i>Abductive Induction:</i> | Process of abstraction/generalization from specific experience to meta-level. |
| 5.) <i>Abductive Hypothesis:</i> | Babies come from the delivery of the stork. |
| 6.) <i>Abductive Deduction:</i> | Application of abductive hypothesis to the concrete and particular experiences. |

Moving on from the Myth

In the meantime, while the child is satisfied with the stork-myth as their abductive hypothesis, the child begins to acquire new information by accumulating life experiences. The fable of the stork begins to become less concrete. Contradictory evidence is accumulated through the unfolding process of development and experience. Freud (1905/2007) explains some of these experiences when he writes,

Children also perceive their mother's change in pregnancy, and interpret them correctly; the fable of the stork is often told to an audience that responds with a profound but generally mute mistrust. (p. 171)

For one, the child recognizes the mother increasing in physical size which begins to insert doubt in the mind of the child. The child questions the validity of the stork-myth. The child may also observe animals and develop disbelief towards their ability to deliver human babies. When enough contradictory evidence has been accumulated, the child discards the stork-myth because it cannot be correctly applied to the concrete experience. Abductive deduction illustrates the faultiness of the hypothesis. The hypothesis no longer fits with the experiences. The child may reason, "If babies come from storks, then why is mommy getting bigger?" The child may also reason, "I have seen storks before and never have I seen it deliver a baby". Alterations to the abductive hypothesis are in the process of becoming.

An unsatisfactory abductive hypothesis leads to the appropriation of questions from the child to the mother (or other parental figures). The mother may then alter her explanations from the stork-myth, to the explanation that the "baby is growing inside of the mother" (Freud, 1908/2007, p. 227). This next relevant experience alters the child's general notions (abductive hypothesis) of where children come from. The abductive induction of this experience and its assimilation into the child's theoretical framework allow for the child to extinguish the incompatible theories of previous abductive

reasoning. The child has now formed the meta-level abductive hypothesis that reasons, "*Babies grow inside of mommy*".

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
| 2.) <i>Research Question:</i> | Where do babies come from? |
| [Please see above for steps 3 – 6]... | |
| 7.) <i>Successive Experience</i> ¹ : | Mommy is growing physically larger, observations of animals directs child towards disbelief in the stork-myth, mother tells the child that the baby grows inside of her, etc. |
| 8.) <i>Abductive Induction:</i> | Process of abstraction/generalization from specific experience to meta-level → integration → alteration of hypothesis. |
| 9.) <i>Abductive Hypothesis:</i> | Babies grow inside of mommy. |
| 10.) <i>Abductive Deduction:</i> | Application of abductive hypothesis to the concrete and particular experiences. |

Deficient Differentiation with the Gender Binary

According to Freud, a child who is not yet in puberty does not know of the differences between males and females (anatomically speaking) (Freud, 1905/2007, p. 169). Therefore, girls and boys are undifferentiated as to anatomical structure. The child is then "hampered in its further developments by an ignorance that cannot be assuaged, and by incorrect theories thrown up by the child's own state of sexuality" (Freud, 1908/2007, p. 228). What Freud means by the child's "own state of sexuality" is that the child has not learned to anatomically differentiate between the male and female and is ignorant of the penis <> vagina distinction (Freud, 1908/2007, p. 228). Consequently, there is perceived continuity between genders. The abductive hypothesis "babies grow inside mommy" must be extended to include the continuity between genders, which the child believes are similar anatomically. This is important because this knowledge, when integrated into the theoretical framework, allows for a new alteration via abductive induction. The theory of where babies come from changes slightly from "babies grow inside of mommy" to the abductive hypothesis, "*Babies grow inside of people, whether it's mommy, daddy, or me*".

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
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2.) *Research Question:*

Where do babies come from?

[Please see above for steps 3 – 10]...

11.) *Successive Experience²:*

Incorporation of the belief that boys and girls are no differentiated, anatomy is the same for both genders.

12.) *Abductive Induction:*

Process of abstraction/generalization from specific experience to meta-level → integration → alteration of hypothesis.

13.) *Abductive Hypothesis:*

Babies grow inside of people, of both genders, whether it's mommy, daddy, or me.

14.) *Abductive Deduction:*

Application of abductive hypothesis to the concrete and particular experiences.

Birth by Belly Button

The next step after the abductive hypothesis is the application of the hypothesis via abductive deduction. The child starts believing that the baby grows inside of people. But how does the baby come out? Sub-questions within the general theme of childbirth begin to form. The baby comes from somewhere in the body. A location must be found. The child tries to apply general knowledge to the particular experience via abductive deduction. The child searches for theories of where babies are born from in the body. Freud (1908/2007) is correct when he alludes to this by saying,

Ignorance of the vagina also means that the child can be convinced of the second of its sexual theories. If the child grows in the mother's body and is removed from it, the only possible conduit through which this can take place is the intestinal orifice. *The child must be evacuated like an excrement, a stool.* If this questions becomes the object of solitary reflection, or of discussion between two children, the information will doubtless emerge that the child comes out of the opening navel, or the belly is cut open and the child removed from it. (p. 231)

The developing child, through its limited capacity of anatomical understanding, makes guesses as to where childbirth occurs. The anus, the belly-button, and the stomach are close to where mommy is growing physically. The child uses this information to further their conceptual understanding.

The child's search for answers has fixated within the realm of physical birth. A child's understanding of the body and a child's knowledge thus far of anatomy will affect

the inductive/deductive processes in abductive reasoning. Freud acknowledges that the incorrect anatomical knowledge will yield very different anatomical solutions. Freud (1905/2007) writes,

There were very different anatomical solutions: Children come out of the breast, or are cut from the body, or else the navel opens up to let them through. Outside of analysis one seldom recalls the research of early childhood into this subject; it has long since succumbed to repression, but its results were always similar. One gets children by eating something particular (as in a fairy tale) and they are then born from the bowel just as stools are passed. These childhood theories recall certain arrangements in the animal kingdom, particularly in the cloacae of sub-mammalian species. (p. 171)

The various explanations of birth via anatomical structure yield a variety of induction, and even more potential abductive hypotheses. Inductions to the child's meta-level conceptions are understood as abductive hypothesis, "*The baby comes from a person's body, man or woman, and it comes out of the stomach/anus/navel/etc.*" This becomes the operational conception for a while as the child tries to apply the abductive hypothesis to the concrete everyday experience by abductive deduction.

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
| 2.) <i>Research Question:</i> | Where do babies come from? |
| [Please see above for steps 3 – 14]... | |
| 15.) <i>Successive Experience³:</i> | The search for answers changes from the external world to one's own body. There baby must grow inside the person, and there are only so many places from which the can be born. The anus, the belly-button, and the stomach look like places close to where mommy is growing physically. |
| 16.) <i>Abductive Induction:</i> | Process of abstraction/generalization from specific experience to meta-level → integration → alteration of hypothesis. |
| 17.) <i>Abductive Hypothesis:</i> | The baby comes from a person's body, man or woman, and it comes out of the stomach/anus/navel/etc. |
| 18.) <i>Abductive Deduction:</i> | Application of abductive hypothesis to the concrete and particular experiences. |

Sex and Aggression

Freud continues and says that as the child ages, the accidental witnessing of parental sexual intercourse will occur. Due to the incomplete perception of what sexual intercourse *is*, the child develops, what Freud calls, a “sadistic view of coitus” (Freud, 1908/2007, p. 232). Freud (1905/2007) says,

When children become spectators of sexual relations between adults at such a tender age—the adults being convinced that the child has no understanding of sexual matters—they cannot avoid seeing the sexual act as a kind of mistreatment or overpowering, in the sadistic sense. (p. 171)

The act of love is interpreted as an act of violence. The child misinterprets the physical rigor of sex by associating it with physical violence. The child is on occasion reprimanded for his/her own violent acts. He learns that physical violence hurts other people. This general knowledge of violent physical interaction is applied (via abductive deduction) to the experience of his parents having sex, resulting in an abductive hypothesis of a sadistic view of sexual intercourse.

Out of embarrassment, the parents try to again explain to the child what was happening. The parents may explain that the two adults were playing together and by playing together babies are created. They fabricate another explanation when they say that the conception of babies, while playing together, can only occur during the condition of marriage. This explanation opens up a whole new sub-category in the realm of childbirth and pregnancy—the condition of marriage. Freud (1908/2007) comments by saying,

In a broader context of the insoluble problem of where children come from, the child deals with the issue of the essence and content of the condition called ‘being married’, and provides different answers according to...chance perceptions. (p. 233)

Newly discovered information is processed and integrated by abductive reasoning. When the child witnesses the parents’ act of sexual intercourse, the experience, along with its explanation as a condition of marriage, is inducted and assimilated into the meta-level conception. The belief of childbirth is identified as having a direct relationship with the chance perception of marriage (Freud, 1908/2007, p. 232). The child now believes that, “*Babies come from the act of playing together when two people are married and the baby will grow inside the man or the woman and comes out via the stomach/anus/navel/etc.*”. Each experience has affected the overall conception of where babies come from.

- 1.) *Research Problem:* Loss of parental devotion due to new-sibling pregnancy.
- 2.) *Research Question:* Where do babies come from?
- [Please see above for steps 3 – 18]...
- 19.) *Successive Experience4:* The child witnesses the act of sexual intercourse, and intercourse is explained by the parents in relation to childbirth, but not as it's real function. Presentation of another myth-story.
- 20.) *Abductive Induction:* Process of abstraction/generalization from specific experience to meta-level → integration → alteration of hypothesis.
- 21.) *Abductive Hypothesis:* Babies come from the act of playing together when two people are married and can grow inside the man or the woman and comes out via the stomach/anus/navel/etc.
- 22.) *Abductive Deduction:* Application of abductive hypothesis to the concrete and particular experiences.

From Marriage to Multilinearity and Beyond

With intertwined relations of marriage and birth, Freud (1905/2007) writes that,

In addition, children are greatly preoccupied with the problem of what sexual intercourse or, as they understand it, marriage may consist in, and generally seek the solution to the mystery in a union accomplished by the agency of the functions of urination or defecation. (p. 171)

Freud also writes about the child's assimilation of such content, and the various results of abductive hypotheses. Freud comments on some of the child responses that he had heard regarding how babies are formed in marriage. For example, Freud describes one child who says, "you urinate in front of each other" (Freud, 1908/2007, p. 233). Another child says, "the husband urinates in the wife's pot" (Freud, 1908/2007, p. 233). In a third example, babies are a result of "showing your bottom to each other (without being ashamed)" or even "the mingling of blood" (Freud, 1908/2007, p. 234). However, the child is not done developing beliefs about childbirth. By this time, the child becomes active within the social discourse.

As children develop, they enter into a social discourse. Sexual information from other children in an uninhibited social condition allow for the co-construction of a collective sexual theory, as well as the alteration of one's own personal sexual theory by

abductive reasoning (Freud, 1908/2007, pp. 234-5). Other myths and stories form resulting in a multi-linearity of development. The ignorance of the penis, the vagina, and the components of proper sexual anatomy as well as the birthing process are eventually dispelled. Assimilations and accommodations in abductive reasoning and generalization occur in accordance with new sexual knowledge. The truth and reality of the birthing process eventually finds its place in the meta-level conceptions of childbirth. As the child develops, so do the conceptions of the child, both by inducting information to change the meta-level conception, and by deducing and applying these conceptions to other experiences.

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| 1.) <i>Research Problem:</i> | Loss of parental devotion due to new-sibling pregnancy. |
| 2.) <i>Research Question:</i> | Where do babies come from? |
| [Please see above for steps 3 – 22]... | |
| 23.) <i>Successive Experience5:</i> | The child enters the social domain and learns from friends, parents, and educational institutions the correct way in which the baby is conceived: sexual intercourse. |
| 24.) <i>Abductive Induction:</i> | Process of abstraction/generalization from specific experience to meta-level → integration → alteration of hypothesis. |
| 25.) <i>Abductive Hypothesis:</i> | Babies are produced by the uniting of the sperm and egg after the sexual act of intercourse. |
| 26.) <i>Abductive Deduction:</i> | Application of abductive hypothesis to the concrete and particular experiences. |

With the example given by Freud, the process of abduction is better understood. In abductive reasoning there is a research problem that causes the individual to ask a research question. The individual sets out to solve this question by abductive reasoning. This takes places over time and with the accumulation of experiences that allow for the collection of information. This information is abstracted and generalized to the meta-level resulting in the abductive hypothesis. The abductive hypothesis is the answer to or belief about the question. However, based upon the axiom that all experiences are unique, this general hypothesis will only apply partially—if at all—to the next experience. Therefore changes must be made to the hypothesis/belief in order to accommodate the following individual experience(s). This process is ontological and continues throughout life. Perceptual notions of static hypotheses and beliefs are a result of either self-maintaining hypotheses/beliefs dominating the psychological system, or the lack of contradictory evidence to the current hypothesis/belief.

CONCLUSIONS

Abductive reasoning is a developmental reasoning process. The individual conceptions of the world constantly change. As little scientists, individuals guess answers to the questions of life. The individual cannot always verify facts and therefore his or her theory may be based on false premises (i.e., the stork story in the example above). Freud (1905/2007) says that,

Generally speaking, we may say of children's sexual theories that they are representations of the child's own sexual constitution and, despite their grotesque errors, they display a greater understanding of sexual processes than one would have expected of their creators. (p. 171)

Freud is right. Such research processes—whether sexual or other—can be “grotesquely” wrong. This is because abduction includes reasoning by guessing, since the human mind does not always require tangible proof in order to believe something. Peirce (1901, as quoted in Pizarroso & Valsiner, 2009, p. 12) acknowledges this point when he states,

Abduction is, after all, nothing but guessing. We are therefore bound to hope that, although the possible explanations of our facts may be strictly innumerable, yet our mind will be able, in some finite number of guesses, to guess the sole true explanation of them. That we are bound to assume, independently of any evidence that is true. Animated by that hope, we are to proceed to the construction of a hypothesis.

Peirce's explanation is true. The child in both the poolside story and Freud's writing of the sexual theories of children used assumptions and guessing as premises in many of their observations about life.

It is not only the individual layman – the little scientist – who uses abductive reasoning. In fact, abductive reasoning is also applied to the *actual* scientist. Scientific development from the beginning of man to the present is one large continuous abductive reasoning process. Phenomena that used to be explained deductively by the influence of the gods are now deductively explained differently. The earth, which was once constructed as the center of the universe, has since been reconstructed as one of many planets orbiting the sun. The examples are endless. The sciences have grown tremendously since the years of their formal birth. The prevalence of scientific material in society today has resulted by the process of abduction. As scholars in developing fields, we are constantly on the brink of paradigm shifts. All it takes is an alteration in a hypothesis or in a belief, and the way we look at the world changes. By abductive processes, individuals or scientific disciplines can change their views of the world, consequently allowing for continuous developments.

We take the researches of the social sciences as given information—available for discovering in the world around us. But this is not that case. Those truths that we hold as self-evident are not. Today's truths are tomorrow fallacies. The premises of our logical reasoning must change to fit the world around us. Therefore, if the world around us is in a constant state of flux, change, and development, then so must our premises of action—our beliefs. It is the researches of the social sciences in which theory and experience entertain each other in an infinite dialogue that produces novel ways of thinking. These novel creations and constructions are beliefs that may result in a small development of social science research, or may result in the large advances of social science frameworks. The sciences have illustrated this process better than any other discipline. The Copernican Revolution, Newtonian Mechanics, Darwinian Evolution, Einstein Relativity are all examples of drastic shifts in premise and paradigm that emerged in the infinite world of becoming through the use of abductive processes. The abductive reasoning process has not and will not stop. There will be new developments in the (social) sciences—of major and minor premises. Similarly, the individual will not stop using abductive processes in their reasoning of the world, and reasoning by the world.

Footnotes:

1. The phrase “successive experience” is used rather than “second experience” in order to differentiate between applicability to experiences. That is to say, “second experience” alludes to the experience that immediately follows. However, it is not necessary that the abductive hypothesis is relevant to the following experience. Therefore, “successive experience” is used to denote that it is the next experience in time that is relevant—that the abductive hypothesis is applied to and altered by. This could be the next immediate experience or an experience a few days later.
2. To reiterate, “successive experience 2” alludes to the next experience in time that is relevant to the abductive hypothesis—either through abductive deduction or abductive induction. This is the second “successive experience” and therefore is called successive experience 2.

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