

THE STORY OF ADAM IN QURAN: A RELATIONAL FRAME THEORY INTERPRETATION^(*)

Nahla Nadeem¹

ABSTRACT

The story of Adam in Quran has often been explored either in relation to strictly Islamic concepts- mainly Adam's appointment as a Caliph on earth, the original sin and his ultimate repentance- or in comparison to the Bible and Torah versions. The present study aims to explore the story from a cognitive and psycholinguistic perspective. Drawing on the basic concepts of relational frame theory (RFT), the study analyzes the relational framing processes involved in describing the "tree" as forbidden by God and as a source of prosperity and eternity by Satan. The analysis shows how the relational framing and reframing of the "tree" functioned as the psychological conditions upon which Adam's attitude towards the tree is formed and changed. The analysis also shows that Adam's verbal behavior and cognitive abilities that are key to his superiority and appointment as caliph on earth are equally responsible for his fall.

Keywords: *Adam's story, relational framing processes, relational framing theory, human language and cognition.*

^(*) This article was submitted on: 27/08/2018 and accepted for publication on: 05/11/2018.

¹ King Abdulaziz University KSA, Cairo University, email: nnadeem@kau.edu.sa

1. INTRODUCTION

The study explores the cognitive and psycholinguistic aspects of Adam's story in Quran and how it relates to his mission on earth, his excellence, sin and repentance. In chapter 2, verses 31-33, the story focused on Adam's verbal and cognitive abilities- mainly, his naming abilities- as one of the reasons behind his superiority and appointment as a Caliph on earth.

﴿وَعَلَّمَ آدَمَ الْأَسْمَاءَ كُلَّهَا ثُمَّ عَرَضَهُمْ عَلَى الْمَلَائِكَةِ فَقَالَ أَنْبِئُونِي بِأَسْمَاءِ هَؤُلَاءِ إِنْ كُنْتُمْ صَادِقِينَ﴾

And He taught Adam the names, all of them; then he presented them to the angels, and said, "Tell Me the names of these, if you are sincere."

﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾

They said, "Glory be to You! We have no knowledge except what You have taught us. It is you who are the Knowledgeable, the Wise." 32

﴿قَالَ يَا آدَمُ أَنْبِئْهُمْ بِأَسْمَائِهِمْ فَلَمَّا أَنْبَأَهُمْ بِأَسْمَائِهِمْ قَالَ أَلَمْ أَقُلْ لَكُمْ إِنِّي أَعْلَمُ الْغَيْبِ السَّمَاوَاتِ وَالْأَرْضِ وَأَعْلَمُ مَا تُبْدُونَ وَمَا كُنْتُمْ تَكْتُمُونَ﴾

He said, "O Adam, tell them their names." And when he told them their names, He said, "Did I not tell you that I know the secrets of the heavens and the earth, and that I know what you reveal and what you conceal?" 33 (2: 31-33)

According to the latest theories of cognitive linguistics and psycholinguistics, the act of naming involves much more than simply "learning the names of objects in the environment" as it includes the following cognitive abilities: relational framing processes (Hayes et al., 2001), thinking processes and logical reasoning (Liu, 2012), the formation of beliefs and attitudes (Waxman, 2016:233-284), relation to expected behavior, rule formation, problem-solving strategies (Goodman et al., 2008:108-154) & (Saffiran et al., 2007:669-680), and metaphorical thinking (Leary, 1995:267-298). The study attempts to explore some of the implications of the relationship between language and cognition in relation to human behavior and human suffering in the light of Adam's story in Quran. It uses the theoretical underpinnings of relational frame theory to offer a psycholinguistic interpretation of some aspects of the story in order to get a deeper understanding and better appreciation of the story in Quran. The study specifically explores the following questions:

- 1- How naming stands as a relational framing activity and the cognitive processes involved.
- 2- How the tree is relationally framed and reframed in the story and how this affects Adam's behavior in committing the act of disobedience and his later repentance;
- 3- And finally, what are the general implications of the story?

In the next section, I'll briefly review the story of Adam in Quran in chapters (2, 7 & 20). Then, some basic concepts of relational frame theory will be reviewed in relation to Adam's story mainly; the definition of relational framing and the relational framing processes of coordination, opposition, cause and consequence. The relational framing and reframing of the tree will be analyzed in relation to Adam's language, cognition and behavior. Finally, implications and conclusions will be discussed.

1.1. The story of Adam in Quran

The story of Adam in Quran started with defining the mission that Adam's creation and his progeny are meant for (2:30). When the angels enquired about the wisdom behind Adam's creation as they foresaw the evils made by mankind. The angels' question was answered by Adam's demonstration of his verbal and cognitive abilities as his mark of superiority and the qualifying trait for his appointment and his future generations as the Caliph on earth.:

﴿وَإِذْ قَالَ رَبُّكَ لِلْمَلَائِكَةِ إِنِّي جَاعِلٌ فِي الْأَرْضِ خَلِيفَةً ۗ قَالُوا أَتَجْعَلُ فِيهَا مَنْ يُفْسِدُ فِيهَا وَيَسْفِكُ الدِّمَاءَ وَنَحْنُ نُسَبِّحُ بِحَمْدِكَ وَنُقَدِّسُ لَكَ ۗ قَالَ إِنِّي أَعْلَمُ مَا لَا تَعْلَمُونَ﴾

30- When your Lord said to the angels, "I am placing a successor on earth." They said, "Will You place in it someone who will cause corruption in it and shed blood, while we declare Your praises and sanctify You?" He said, "I know what you do not know."

Witnessing Adam's verbal abilities, and acknowledging his superiority, Adam was honored by the Angels' prostration as God ordered¹:

﴿وَإِذْ قُلْنَا لِلْمَلَائِكَةِ اسْجُدُوا لِآدَمَ فَسَجَدُوا إِلَّا إِبْلِيسَ أَبَىٰ وَاسْتَكْبَرَ وَكَانَ مِنَ الْكَافِرِينَ﴾

¹ God honored Adam, in countless ways. Besides the gift of language and cognition, He blew his soul into him, He fashioned him with His own hands and He ordered the Angels to bow down before Him.

And We said to the angels, "Bow down to Adam." They bowed down, except for Satan. He refused, was arrogant, and was one of the disbelievers. (2:34)

Adam and his descendants were to be the caretakers on earth, so God taught Adam what he needed to know to perform this duty. He gave him the ability to identify and designate names to everything; He taught him language, speech and the ability to communicate. God also imbued Adam with an insatiable need for and love of knowledge. The verses talked about the language training that took place prior to Adam's engagement in the naming activity in front of the Angels upon being instructed by God to do so. Sadia et al. (2012:261-264) write about the Angels' prostration:

The viceregency of God rests in the attribute of "knowledge". He bestowed the gift to Adam and taught him the names, properties and qualities of all the existents, animate or inanimate objects. He brought Adam before the angels. God ordered Adam to tell Angels the names he learnt. According to some commentators, these might not be the exact names he told, but he may differentiate one thing from the other, which meant to tell about man's nature that he can differentiate between good and bad. The angels were then commanded to prostrate before Adam. They confirmed his superiority and were quick to obey. (P. 961)

The following verses also described Adam's verbal training that implied much more than just naming. According to RFT, it involved other cognitive processes and "relational framing activities": e.g. relating the external object "tree" to its name "this is a tree", adding the attributive quality "this is the forbidden tree" and receiving the instruction "don't eat from it/ don't even approach it" and the consequence of not following the instruction (2:35).

﴿وَقُلْنَا يَا آدَمُ اسْكُنْ أَنْتَ وَزَوْجُكَ الْجَنَّةَ وَكُلَا مِنْهَا رَغَدًا حَيْثُ شِئْتُمَا وَلَا تَقْرَبَا هَذِهِ الشَّجَرَةَ فَتَكُونَا مِنَ الظَّالِمِينَ﴾

35- We said, "O Adam, inhabit the Garden, you and your spouse, and eat from it freely as you please, but do not approach this tree, lest you become wrongdoers".

According to relational frame theory, the language training involved a number of relational framing processes that are based on the

simple naming activity. These relational framing processes include other cognitive abilities: a) relating the name to the designated object in the environment, b) distinguishing “the tree” as “a forbidden object” from other trees/ objects in the garden as permissible, c) following the order “don’t approach and don’t eat” and showing the consequence “lest you become wrongdoers”. God’s framing of the tree as “forbidden”, “harmful” and eating from it is as an act of transgression is contrasted by Satan’s reframing of the same tree later as “a source of ultimate prosperity and immortality”. In chapters 7 (20-2) and 20 (120- 121), Satan used the language of deceit to relationally reframe the tree as a means to be “angles and live forever”:

﴿فَوَسْوَسَ لَهُمَا الشَّيْطَانُ لِيُبْدِيَ لَهُمَا مَا وُورِيَ عَنْهُمَا مِنْ سَوْآتِهِمَا وَقَالَ مَا نَهَاكُمَا رَبُّكُمَا عَنْ هَذِهِ الشَّجَرَةِ إِلَّا أَنْ تَكُونَا مَلَكَتَيْنِ أَوْ تَكُونَا مِنَ الْخَالِدِينَ﴾

20- But Satan whispered to them, to reveal to them their nakedness, which was invisible to them. He said, "Your Lord has only forbidden you this tree, lest you become angels, or become immortals".

﴿وَقَاسَمَهُمَا إِنِّي لَكُمَا لِمِنَ النَّاصِحِينَ﴾

٢1- And he swore to them, "I am a sincere advisor to you". (7:20-1)

﴿فَوَسْوَسَ إِلَيْهِ الشَّيْطَانُ قَالَ يَا آدَمُ هَلْ أَدُلُّكَ عَلَى شَجَرَةِ الْخُلْدِ وَمُلْكٍ لَّا يَبْتَلِي﴾

١٢٠ But Satan whispered to him. He said, "O Adam, shall I show you the Tree of Immortality, and a kingdom that never decays"?

After Adam and Eve realized that they have disobeyed God by eating the fruit from the tree and they saw their naked bodies, he pleaded to God for forgiveness and God accepted as shown in the verses below (20:121-2) & (7: 23):

﴿فَأَكَلَا مِنْهَا فَبَدَتَ لَهُمَا سَوْآتُهُمَا وَطَفِقَا يَخْصِفَانِ عَلَيْهِمَا مِنْ وَرَقِ الْجَنَّةِ ۗ وَعَصَى آدَمُ رَبَّهُ فَغَوَى﴾

121 And so they ate from it; whereupon their bodies became visible to them, and they started covering themselves with the leaves of the Garden. Thus Adam disobeyed his Lord, and fell.

And God accepts their plea:

﴿ثُمَّ اجْتَبَاهُ رَبُّهُ فَتَابَ عَلَيْهِ وَهَدَىٰ﴾

122- But then his Lord recalled him, and pardoned him, and guided him.

﴿قَالَا رَبَّنَا ظَلَمْنَا أَنفُسَنَا وَإِن لَّمْ تَغْفِرْ لَنَا وَتَرْحَمْنَا لَنَكُونَنَّ مِنَ الْخَاسِرِينَ﴾

23- They said, "Our Lord, we have done wrong to ourselves. Unless You forgive us, and have mercy on us, we will be among the losers". (7: 23)

In fact, God taught him the exact words of repentance (2:37):

﴿فَتَلَقَّىٰ آدَمَ مِنْ رَبِّهِ كَلِمَاتٍ فَتَابَ عَلَيْهِ ۗ إِنَّهُ هُوَ التَّوَّابُ الرَّحِيمُ﴾

37- Then Adam received words from his Lord, so He relented towards him. He is the Relenting, the Merciful.

Still, Adam and Eve were ordered to leave the Garden which they were in and descend to earth where they and their children will live and die, and where Satan will also be (7:24-5)

﴿قَالَ اهْبِطُوا بَعْضُكُمْ لِبَعْضٍ عَدُوٌّ وَلَكُمْ فِي الْأَرْضِ مُسْتَقَرٌّ وَمَتَاعٌ إِلَىٰ حِينٍ﴾

24- He said, "Fall, some of you enemies to one another. On earth you will have residence and livelihood for a while."

﴿قَالَ فِيهَا تَحْيَوْنَ وَفِيهَا تَمُوتُونَ وَمِنْهَا تُخْرَجُونَ﴾

25- He said, "In it you will live, and in it you will die, and from it you will be brought out".

Throughout the story, the verses described the interactions between God, Adam and the angels, Adam and Satan as communicative events where language and cognition are key aspects. Though the story of Adam is often discussed from a strictly "religious" perspective- e.g. in relation to Adam's mission on earth, questions of faith, sin and repentance, I argue that the role of language and the cognitive processes involved are highlighted in the story and therefore are worth exploring and further investigation. The study particularly focuses on the cognitive processes involved in the naming and framing of the tree and how Satan deceitfully tricked Adam and Eve into disobeying God by reframing it. In the next

section, I will use some of the basic concepts of relational frame theory (RFT) to explore these cognitive aspects of language in the light of the story in Quran.

2. Relational Frame Theory: A Brief Overview

According to relational framing theory (RFT), relational framing is the process of “relating objects and events verbally”, so they become part of the world as we know it (Hayes et al., 2001:21-51). In the early language training, children acquire the ability to frame objects and events relationally- e.g. using the process of coordination to relate the spoken word “tree’ to “the external object tree” and the written form tree”. In time and with continued verbal interactions, humans come to develop an increasingly complex and multi-relational networks involving a vast number of different objects and events, and the relations between them. These relational networks ultimately explain how we as human beings, relationally frame everything we encounter and think about, including ourselves, our thoughts and emotions, our prospects, other people, and our environment. There are many types of relational frames that can verbally relate objects and concepts together. It accounts for simple relational framing activities (like naming an object) to the extremes of artistic creativity (like writing a book or a poem) or doing very complicated reasoning and problem solving in making scientific discoveries and interdisciplinary research.

RFT’s definition of a “frame” is very similar to Goffman’s (1974) work on framing analysis where it is used as a metaphor: “Just like a frame can contain any picture”, we make a collage of the world events through our perception and language . In the framing analysis literature, frames are mainly described as (1) metaphorical containers, (2) structures of expectations (Bateson, 2000; Goffman, 1974; Tannen 1993), and (3) as opinion shapers or thought manipulators (Lakoff, 2004). Wine (2008:1-3) writes:

As a metaphorical container, a frame sets a relationship between the elements within and how they stand in relation to one another. It aligns them together and gives a sense of coherence. “Sacks (1992) was getting at this kind of coherence when he wrote that the baby cried and

the mommy picked her up formed a story because our common sense notions of cause and effect and family relations lead us to frame the two utterances as related (i.e., to hear them this way). We do this, according to Bateson (2000), Goffman (1974, 1981), and Tannen (1993), because we have socially and culturally-embedded schema or structures of expectation about what the juxtaposition of certain elements within a frame means (p.2).

Relational framing is an extremely generative process. Any verbal stimulus can be related to any other stimulus in accordance with any relational frame and this gives natural language its greatest use in the description and analysis of the environment. According to RFT, there is a great number of relational frames that are used to frame and structure a certain message, create different meaning connections and collages of life experiences. These relational frames create mutual and combinatorial entailment that cognitively bind these events within a particular frame as one whole. Thus, the empirically established cognitive process of relational framing can explain the highly generative, flexible and creative nature of human language in facilitating these relational frames and allowing them to develop into very complex relational networks. However, for the purpose of the analysis I will limit the review to the relational frames of coordination, opposition, causality and consequence which will be discussed in section 2.1 below.

2.1. Families of Relational Frames in Adam's Story: Relational Frames of Coordination, Opposition, Causality and Consequence.

Coordination

The relational frame of coordination is a relation of identity, sameness, or similarity: (this is/ or is similar to that). Frames of coordination establish equivalence classes through mutual entailment. "X is Y" and requires a dimension along which two events "relata¹" are similar. That dimension

¹ Relata' is used as a very general term that can incorporate any objects or semantic events that are framed in relation to one another through families of relational frames. It covers objects and cognitive concepts – e.g. the tree is relationally framed as equivalent to the forbidden tree through the relational frame of coordination.

might be purely contextual and/ or conceptual so the relation can be abstracted through the transformed functions of the relata (Hayes et al., 2001, p.35). Through the manipulation of the relational framing of coordination, the tree can be contextually related to an external physical object “this is a tree” and conceptually perceived through the added attributive quality “this tree is forbidden”.

Opposition/ Contrast

The relational frame of opposition “X is dissimilar to Y” also requires some specified dimension – a point of reference - along which events can be ordered as dissimilar in one direction along the continuum involved. (Hayes et al., 2001, p.36) The relational frame of opposition typically specifies the dimension of relevance. In the story, the relational framing of opposition defines what is permissible and what is impermissible in the garden. So, Adam and Eve can eat from any/all the trees except for the “forbidden” one. It is also manipulated by Satan in reframing the tree and giving it the opposing qualities of “prosperity and immortality”. This relational reframing not only expands the functions of the tree but poses a logical reasoning problem that needs to be solved. Notice that until Adam committed the act of transgression, the “tree” dilemma is mainly a matter of verbal exploitation of the naming process and the conceptual relational framing of the “tree” in each case. The relational framing also happened in two separate communicative events as depicted in the verses cited above (2: 120- 125 & 7:19-21). Two more relational framing processes are used in relation to the tree; that of causality and consequence because the verses also introduce the consequences of the two contrasted relational framing.

Causality and Consequence

In causality, events are said to cause events when a speaker frames events as, “A causes B” and in reverse, “B is the consequence of A” through mutual entailment. In the story, the cause- effect relational framing depends on the positive/ negative attributes assigned to the tree as shown in table 1 below:

Relational Framing Process	External Object	Name	Evaluative Attributes	Consequence
	Tree	The tree	Harmful and forbidden	Don't approach Or you will become wrongdoers
Coordination Opposition & Cause-effect.	Tree	The tree	Prosperity and immortality	You will be angels and immortal

God’s naming and framing of the tree as opposed to Satan’s reframing reflect two conflicting beliefs about the reality of the tree. In the naming event (2:35), the tree is lexicalized as a definite object “the tree as this tree” plus an order of “don’t approach”. Satan’s reference to the tree further elaborated and lexicalized it as “the tree of prosperity and immortality”. Understanding these conflicting beliefs depends on Adam’s logical reasoning in unpacking these relational frames. The “tree” dilemma also requires problem- solving and decision- making abilities since Adam and Eve have to make a choice between which one to adopt and follow which will determine their future behavior in relation to the tree. Crucially, once Adam and Eve acted upon their choice, they are instantly exposed to a whole new world- the world of their inner feelings and deep desires. Initially, the naming training only involved exploring the external world around them, yet acting upon their own free will, they get access to their own private world and inner feelings. In fact, Satan’s reframing of the tree as “a source of prosperity and immortality touched upon Adam’s deeper desires and wants that were not yet articulated through language. In other words, the act of transgression itself opened a window to their inner selves as it brought about feelings of shame, pain and regret. Repentance came as a cure and he was taught the words of repentance through another communicative event (7:23):

﴿فَتَلَقَىٰ آدَمَ مِنْ رَبِّهِ كَلِمَاتٍ فَتَابَ عَلَيْهِ ۗ إِنَّهُ هُوَ التَّوَّابُ الرَّحِيمُ﴾

37- Then Adam received words from his Lord, so He relented towards him. He is the Relenting, the Merciful. (2:37)

﴿قَالَا رَبَّنَا ظَلَمْنَا أَنفُسَنَا وَإِن لَّمْ تَغْفِرْ لَنَا وَتَرْحَمْنَا لَنَكُونَنَّ مِنَ الْخَاسِرِينَ﴾

23- They said, "Our Lord, we have done wrong to ourselves. Unless You forgive us, and have mercy on us, we will be among the losers". (7: 23)

Now the tree is verbally related not merely to the instruction “don’t approach”, but also to “sin” and the verbal behavior of “repentance.” These new relational activities can change the functions of the tree since the actual tree and the word “tree” may now paradoxically evoke thoughts of guilt, shame, sadness and redemption. Through relational framing, the function of “transgression” and “sin” can also be transformed to other “impermissible items” so the tree” can be symbolically framed as “any act of transgression where Man doesn’t follow God’s orders”. So, the connection can further expand to cover a whole relational network of “helal”- what is permissible & “haram”- what is impermissible.

Though the story does not describe Adam and Eve’s feelings after committing the sin in detail, yet, the verses shed light on how fundamental language is to human psychology in which language and cognition seem to play a key role. In repenting, Adam’s language behavior evolves in the full sense of the word as language is not merely used as a tool to explore the world externally but to understand his own private world and the relationship between them through cognition and reasoning. Villiers & Villiers (2014:313-318) write about the relationship between the role of language in understanding our own mental states:

Not only do we learn the words that label such private events by hearing others talk about and interpret our inner worlds, but we begin to bring these together into causal webs that constitute our first primitive psychological theories (Dunn & Brophy, 2005; Nelson, 2005). This approach to ToM (theory of Mind) development, therefore, focuses on the importance of learning words as labels for mental states that may not be directly observable in behavior. (P.214)

Thus, the same relational framing processes that enable human beings to explore the environment and make new meaning connections between objects and events also enable Man to suffer through reliving his past suffering and mentally create anxieties about his future behavior. Wilson et al. (2001:211) write about the role of language in man’s pathology:

Relational Frame Theory, however, suggests another possibility: that human language and cognition is a direct source of many human psychological problems. More specifically, although the

bidirectional transformation of functions allows for impressive and advantageous expansions of an individual's behavioral repertoire, this repertoire at the same time sows the seeds for psychological suffering. P.214

3. CONCLUSION

In the foregoing analysis, I have attempted to highlight the role of language and cognition in Adam's story in Quran. I specifically focused on how the relational framing and reframing of the "tree" functioned as the psychological conditions upon which Adam's attitude towards the tree is formed, elicited, and changed. The story offers insight on how Adam's verbal and cognitive abilities befit his mission on earth as they enable him to explore the environment, expand his knowledge through relationally framing events and objects and make sense of the world around him. His language abilities also give him access to his inner world so he is capable of self-insight and self-criticism. Exercising his free will in making behavioral choices might eventually lead to erring or even falling and suffering; yet, he gets more self-awareness and a chance to bounce back stronger and better.

REFERENCES:

- Wilson, K., Hayes, S., Gregg, J., Zette, R. (2001) Psychopathology and Psychotherapy. In Hayes, S., Barnes-Holmes, B. & Roche, B. (Eds.). *Relational Frame Theory: A Post-Skinnerian Account of Human Language and Cognition* (pp. 211-237). New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers.
- Villiers, J. & Villiers, P. (2014) The Role of Language in Theory of Mind Development. *Top Lang Disorders*, 34(4),313–328.
- Hayes, S., Fox, E., Gifford, E., Wilson, K., Barnes-Holmes, D., & Healy, O. (2001) Derived Relational Responding as Learned Behavior. In Hayes, S., Barnes-Holmes, B. & Roche, B. (Eds.). (2001). *Relational Frame Theory: A Post-Skinnerian Account of Human Language and Cognition* (pp.21-51). New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers.
- Goffman, E. (1974). *Frame analysis*. New York: Harper & Row.
- Bateson, G. (2000). *Steps to an ecology of mind*. Chicago: University of Chicago Press.
- Tannen, D. (1993). Introduction. In D. Tannen (Ed.), *Framing in discourse* (pp. 3-13). New York: Oxford University Press.
- Lakoff, G. (2004). *Don't think of an elephant*. White River Junction, VT: Chelsea Green.
- Wine, L. (2008). Towards a Deeper Understanding of Framing, Footing, and Alignment. *Working Papers in TESOL & Applied Linguistics*, 8(2), 1-3.
- God honored Adam, in countless ways. Besides the gift of language and cognition, He blew his soul into him, He fashioned him with His own hands and He ordered the Angels to bow down before Him.
- ¹ Sadia, H., Badshah, S., Dad, K., Khan, J., Nasrullah, Shahzad, S. (2012) The Creation of Man in the Bible and the Holy Quran. *International Journal of Asian Social Science*, 2(6), 961-964.
- Hayes, S., Fox, E., Gifford, E., Wilson, K., Barnes-Holmes, D., & Healy, O. (2001) Derived Relational Responding as Learned Behavior. In Hayes, S., Barnes-Holmes, B. & Roche, B. (Eds.). (2001). *Relational Frame Theory: A Post-Skinnerian Account of Human Language and Cognition* (pp.21-51). New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers.
- Liu, N. (2012) The Effect of Naming Systems on the Acquisition of and Reasoning about Time Concepts. (Unpublished doctoral dissertation). The University of Hawaii, Hawaii.

- Waxman, S. (1999) "The Dubbing Ceremony Revisited: Object Naming and Categorization in Infancy and Early Childhood". In D. L. Medin & S. Atran (Eds.) *Folkbiology* (pp. 233-284). Cambridge, MA: MIT Press/ Bradford Books.
- Goodman, N., Tenenbaum, J., Feldman, J., Griffiths, T. (2008) A Rational Analysis of Rule-Based Concept Learning. *Cognitive Science*, 32 (1), 108-154.
- Saffran, J., Seth, P., Pollak, R., Seibel, A. (2007) Dog is a dog is a dog: Infant Rule Learning is not Specific to Language. *Cognition*, 105(3), 669-680.
- Leary, D. (1995) Naming and Knowing: Giving Form to Things Unknown. *Social Research*, 62(2), 267- 298.