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Characterization of the Possible Role of Histone H4 in DNA Methylation

by Francis Maddox
Biology

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Molecular Biology

*Scientific language in this document is held to a minimum,
necessary vocabulary is documented in appendix I.

*For differentiation purposes of this paper, names of genes are
italicized while names of proteins are not.

Abstract

One of several mechanisms by which genomic expression is regulated, DNA methylation is especially important for its role in post-transcriptional gene silencing. A number of recent investigations indicate the possibility that the core histones, around which DNA is packaged into the nucleosome, play some role in the methylation of chromosomal DNA. This study will indicate to what extent histone H4 and its associated residues are interrelated with the process of DNA methylation. Such correlations will be identified by substituting each of twenty-one isolated modifications of the gene encoding histone H4 for that same gene in a suitable strain of *Neurospora Crassa*. Using methylated plasmid probes in a southern analysis of each modified strain, the presence of methylated DNA

in those strains can be observed qualitatively. A southern analysis also indicates whether, and to what extent, the various residues of histone H4 are involved in this genomic process.

Introduction

DNA, the genetic code for all living organisms, is specially organized as nucleosomal chromatin in eukaryotic cells. Genes located on that DNA are to a large extent dependent upon the conformation of that structure and upon the numerous post-translational modifications to which that structure is constantly exposed (Turner 2001). Thus chromatin organization is important to determine gene expression or silencing.

The primary unit of chromatin is the nucleosome. Each nucleosome is made up of a strand of DNA, 146 base pairs in length, wrapped around a structure of protein subunits referred to as histones (Turner 2001). Together these eight core histones—two copies of each of hH2A, hH2B, hH3 and hH4—comprise what is called the histone octet (Figure 1). The majority of each histone functions as a simple packaging unit for DNA, but the n-terminal tails of each core histone, because of their positions, are susceptible to a number of post-translational modifications including methylation, acetylation, phosphorylation, and ubiquitination. Those post-translational modifications have significant impacts on gene expression (Ringo 2004). The most striking evidence of this is the gene *dim-5* (defective in methylation of DNA) that, instead of encoding an expected DNA methyltransferase, codes for a histone methyltransferase.

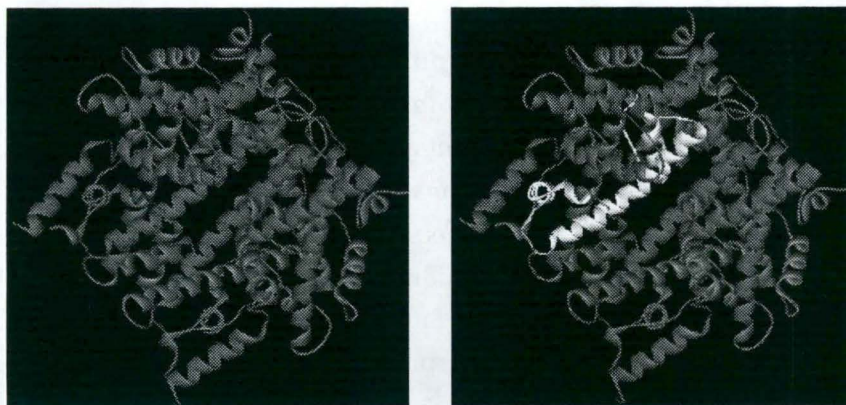


Figure 1: Crystal structure of the histone octet (left) with histone H4 highlighted in white (right).

Recent investigations that sought to characterize methylation and acetylation on specific residues of the histone H4 n-terminal tail have shown an ability of these modifications to affect gene expression. Furthermore, UO PhD graduate Shan Hayes has shown that modifications to some of the residues of the H4 tail can cause lethality and growth deficiency when using *neurospora crassa* as a model organism. The present study shows how the n-terminal tail of histone H4 can be altered so that it affects the methylation of any chromatin bound DNA.

DNA methylation, the addition of a methyl group to a cytosine base at various CpG sites, plays a significant role in the long term regulation of genomic data. DNA methylation promotes gene expression, but more often it is associated with the silencing of many unnecessary genes found in most organisms (Honda 1975). Also, methylation is a useful mechanism for specificity of cell types as genes in some specific cells are turned off while the same genes

are left on in other cells.

To study DNA methylation and its relationship to histone H4 and be applicable to numerous organisms, this study utilizes the fungus *neurospora crassa*, a model eukaryote as detailed in Roland Davis's *Neurospora: Contributions of a Model Organism*. The simplistic genomic structure of *Neurospora* allows for a reasonable level of control in gene manipulation. Also, a great number of proven experimental techniques, many developed and perfected in the Selker lab, exist for testing purposes in the organism.

This study sought to characterize histone H4 and its role (or the absence of a role) in the process of DNA methylation and therefore genomic control in the organism *Neurospora crassa*. To do this, an optimally testable strain of the organism was constructed by crossing a series of strains in the Selker Lab collection and screening for the correct genotype. Because *neurospora* has two genes encoding histone H4, the strains tested in this investigation had to contain a mutation which silences the first *hH4-1* gene such that the results of the experiments could be exclusively applicable to the precise gene to be modified *hH4-2*. Additional mutations in the genome as depicted in figure 3 (materials and methods section) are desirable for accurate southern analysis.

In Figure 3, the *hH4-1 RIP1* mutation is the test mutation with silencing in the gene encoding the first H4 histone. RIP mutations (Repeat Induced Point mutations) are base pair replacement modifications which occur specifically in methylated regions of the genome and function to silence associated genes.

The first two preliminary crosses (XFM-1 and XFM-2) provide the strains necessary to conduct a third cross, the result of which is the first desired strain, XFM-3. The products of each cross are

identified by spot testing and PCR reaction digests of DNA gathered from individual *neurospora* colonies.

The other needed strain is obtained through two more crosses (XFM-4 and XFM-5). The correct products of XFM-3 and XFM-5 are then tested by replacing the gene encoding histone H4 with a modification to that gene affecting one or more residues of the n-terminal tail of the histone protein.

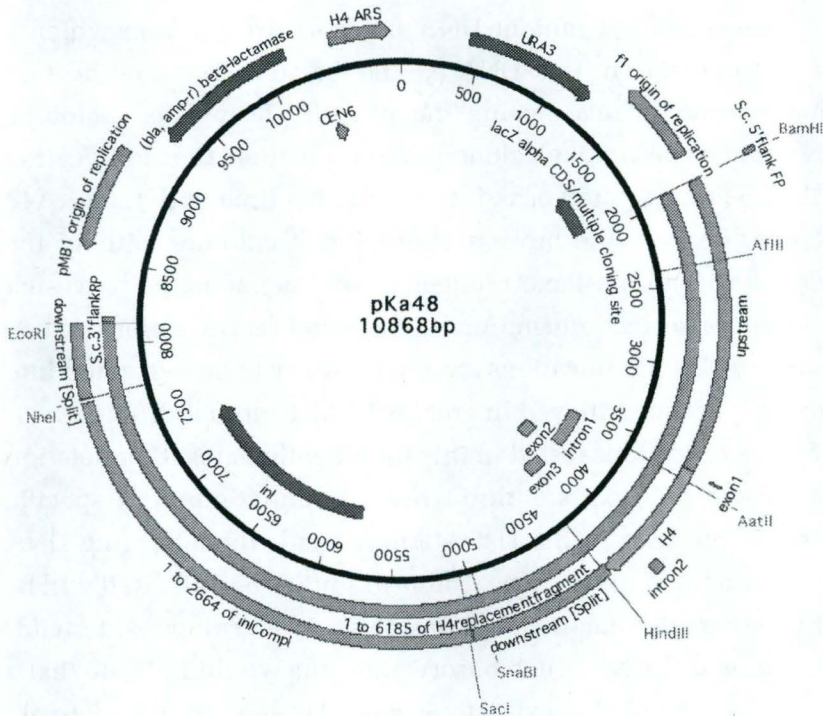


Figure 2: The pKa48 plasmid with upstream and downstream regions. Sites where restriction endonucleases used in this experiment cut the DNA are marked.

These modifications were obtained from laboratory stocks of mutant DNA and converted using the plasmid pKA48 into a usable form (see figure 2). This plasmid acts as a host for the mutant DNA allowing the transfer of H4 modifications back and forth between *neurospora* and *E-coli* cells. Also, the plasmid provides a mechanism for testing correct integration of the mutant DNA. The primary function of the pKA48 plasmid, however, is as a device to clone the mutant DNA in yeast by mitotic cell growth.

The process of preparing the H4 modifications involves first a direct transfer of the mutant DNA into E-coli cells from which a reasonable portion of that DNA can be isolated. The modification is then cloned in yeast using the pKA48 plasmid as a cloning background. When enough cloned DNA is obtained the modification can then be reintegrated back into E-coli, this time with the pKA48 backbone. Because the process yields E-coli colonies without the integrated plasmid, a large number of colonies must be harvested and tested for correct integration by endonuclease digestions. When isolated, the H4 modifications are finally ready to be integrated into the correct strains achieved in crosses XFM-1 through XFM-5.

The modifications tested in this investigation are either deletion mutations of base pairs 1 through 34 or mutations to a specific residue or residues of the H4 n-terminal tail. By subjecting DNA from the modified *neurospora* strains to southern analysis, it will be clear whether DNA methylation decreases when compared to wild-type *Neurospora* DNA. Such observed results would indicate that a role in DNA methylation exists for Histone H4 and create a relatively clear picture of which specific residues are actually involved.

One possible result of this study would be to open the initial idea to further investigation. The tests undertaken as part of this

research may show the viability of the *Neurospora* strains with these modifications at different stages of development. Some modifications of *neurospora* are lethal, and it is likely that others will also be lethal. Such findings would indicate not only a role in DNA methylation but furthermore a role in the methylation of functionally important sections of the genome. Also, I plan to characterize the ability of each mating type *a* or *A* to be fertile and provide further insight regarding areas of the genome that are effected by alterations in the H4 histone. Furthermore, a growth test will show whether the DNA methylation affected by the H4 n-terminal tail has any relation to growth factors.

Materials and Methods

Enzymes and Chemicals: Southern analysis probes were taken from Selker Lab stocks. All restriction endonucleases were purchased from New England Biolabs. Mus-52, am, and hH4-1 PCR primers were ordered through the University of Oregon. All other chemicals used in these experiments were ordered through the University of Oregon Lab Kitchens. All DNA used in this experiment was diluted in TE buffer and stored at -20 degrees Celsius.

Organisms and Strains: All *neurospora* strains were grown from laboratory stocks in the Selker Lab. E-coli cells containing necessary mutations for productive transformations were grown by Tamir Khlafallah in the Selker Lab. Yeast cells for cloning were borrowed from stocks in the Prehoda Lab, University of Oregon.

Crosses: All crosses were plated on 1.5% agar, SC sucrose medium containing necessary nutritional supplements (ie. histodine, inositol, alanine). The little-a mating type was allowed to grow on the medium for three days before addition of the big-A

strain. After seven more days each crossing plate was checked to assure that the paraticia (sexual structure of *neurospora*) had shot spores. In another seven days these ascospores were harvested using sterile water and stored at -20 degrees Celsius.

XFM-2:	his-3 mat A ; hH4-1RIP1 ; am Δ inl X mat a ; am RIP8 <i>mat A his-3; hH4-1RIP1 ; am RIP8</i>
XFM-3:	sad-1 mat a his-3 ; mus-52 Δ ::bar+; inl Δ X mat A his-3; hH4-1RIP1 ; am RIP8 <i>sad-1 mat a his-3; hH4-1RIP1 ; mus-52Δ ::bar+ ; am RIP8 inl Δ</i> <i>mat A his-3; hH4-1RIP1 ; mus-52Δ ::bar+ ; am RIP8 inl Δ</i>
XFM-4:	Sad-1 his-3 Δ inl mus-52 Δ ::bar+ a (XFM-1) X hH4-1RIP1 Δ am am-hph::am A (EB101 stock) <i>Sad-1 his-3 Δinl mus-52Δ::bar+ hH4-1RIP1 Δam am::hph::am a</i>
XFM-5:	Sad-1 his-3 Δ inl mus-52 Δ ::bar+ hH4-1RIP1 Δ am am::hph::am a X Δ inl Δ am am::hph::am his-3::barM A (Zack Lewis' Strain) <i>Sad-1 his-3 Δinl mus-52Δ::bar+ hH4-1RIP1 Δam am::hph::am a</i> <i>and</i> <i>Sad-1 A his-3::barM Δinl Δam am::hph::am hH4-1RIP1 mus-52Δ::bar+ A</i>

Figure 3: Crosses XFM-1 through XFM-5. Products of each cross are highlighted in italics.

A dilution of these ascospores at 100uL spores to 500uL sterile water for each cross was heat shocked at 60 degrees Celsius for 1 hour and then plated out on plates containing a 1.5% agar, Vogel's FGS medium with necessary nutritional supplements. The next day *neurospora* colonies were harvested from these plates in amounts

depicted by Table 1 and were grown up in 1mL slants. To test whether each isolated colony possessed the desire genotype (figure 3), a number of methods were used.

Table 1: Colonies harvested from each individual cross.

	Colonies Harvested	Number of Expected Correct Genotypes	Actual Correct Genotypes
XFM-1	100	12	0
XFM-2	100	12	5
XFM-3	500	15	?
XFM-4	1000	≈ 8	?
XFM-5	200	12	?

Spot testing on liquid medium including or excluding necessary supplements identified deletion mutations. Analysis of PCR endonuclease digestions using the corresponding primers were used to identify all other genes. At this point, incorrect strains were discarded.

hH4-2 modification preparation: Stocks of mutant DNA in the Selker lab were transformed by standard procedures into *E-coli* cells (TFM-7). All modifications are listed in table 2. The *E-coli* cells were then grown for one day at 37 degrees Celsius on LB + ampicillan medium before being harvested. The DNA was isolated from these colonies using standard DNA miniprep procedures and ethanol precipitation.

Modification	Identification	Type	Table 2: Modifications to the gene encoding histone H4's n-terminal tail
$\Delta 1-15$	2198	Deletion	
$\Delta 1-28$	2199	Deletion	
$\Delta 1-34$	2200	Deletion	
$\Delta 1-10$	2201	Deletion	
$\Delta 11-28$	2204	Deletion	
$\Delta 11-34$	2205	Deletion	
K12,16R	2206	Substitution	
K5,8R	2207	Substitution	
K5,8,12,16R	2208	Substitution	
K5,8Q	2209	Substitution	
K5,8,12,16Q	2211	Substitution	
K5,8N	2212	Substitution	
K5,8,12,16N	2213	Substitution	
K8,12N	A	Substitution	
K5,8,12N	B	Substitution	
K5,8,16N	C	Substitution	
K5,12,16N	D	Substitution	
K8,12,16N	E	Substitution	
R3A	F	Substitution	
T1 A	G	Substitution	
K20L	H	Substitution	

A usable section of each coding mutation was then obtained by cutting the DNA of each mutation with AflII and SnaBI. The digest of this DNA was then run out on a 0.8% agarose TAE gel (with ethyl bromide for staining) and the small band containing the desired region was cut out and eluted by standard DNA gel extraction procedures.

The plasmid pKa48 was prepared by cutting it with AatII and HindIII. The digest was then run out on a 0.8% agarose TAE gel (with ethyl bromide). The large band was then cut out and eluted.

The next step, cloning the mutation in yeast, involved combining the DNA fragments from pKa48 and the desired mutation and transforming them into yeast (TFM-8). Salmon sperm DNA was used as a component of the standard transformation solution to increase the overall efficiency. The complete transformation solution was plated on SD (-Ura) medium and left to grow for four days at 30 degrees Celsius.

After four days the yeast colonies had grown and were harvested using 2 mL of YEPD broth. A smash and grab lysis was preformed on the yeast cell suspension, and DNA was obtained for each of the mutations with a pKa48 backbone.

It was then necessary to transform the mutant DNA back into *E-coli* (TFM-9). The transformation was conducted under standard procedures and the *E-coli* cells were grown for one day at 37 degrees Celsius on LB + ampicillan medium. Twenty colonies from each transformation were harvested and grown for one more day on 2 mL liquid LB + ampicillan medium at 37 degrees Celsius. Plasmid isolations were then conducted using standard procedures to isolate the plasmid DNA from the *E-coli* cells.

To verify that any of the DNA isolated from these *E-coli* colonies

contained the correct modification, the plasmid DNA was from each colony was tested in two digests, the first being a BamHI/EcoRI digestion and the second being a HindIII/EcoRV digestion. After these were run out on a 1.2% agarose TBE gel (with ethyl bromide), a pattern consistent with the same digestion on pKa48 was observed in the correct DNA. This DNA was isolated for all mutations and used in the testing of hH4 involvement in DNA methylation.

**Testing of hH4 involvement in DNA methylation:* The DNA from each H4 modification will be transformed into each of the *neurospora* test strains (XFM-3, XFM-4). This transformation will be carried out by standard procedures and will be plated out on Vogel's FGS medium with the necessary supplements and grown for four days at 32 degrees Celsius. Colonies harvested from these plates will be grown up in 1 mL slants of the same medium for three days. Each culture will then be inoculated in liquid medium of the same composition and grown for four days. A DNA miniprep will then be conducted on these liquid grown *neurospora* cells. That isolated DNA will be run out on a 1.2% agarose TBE gel (with ethyl bromide) and a southern blot will be conducted on the gel. The blot will then be probed with methylated plasmid probes to test for any effect on methylation by any of the hH4 mutations.

**testing of hH4 involvement in DNA methylation is incomplete. See the results and discussion section*

Results and Discussion

Although the current results of this study fail to answer the original question of the H4 histone's effect on DNA methylation, the results provide some insight as to how this study can be continued and the ultimate question solved.

The bacteria *E-coli* is useful in transfer of plasmid DNA, such as the histone coding modifications used in this study, but because most viruses and bacteriophages utilize plasmid DNA, it is essential that wild type *E-coli* cell have mechanisms for combating foreign DNA. Therefore, there are restriction enzymes (much like the restriction endonuclease enzymes used in this study) present in the *E-coli* cells which cut foreign DNA into unrecognizable and hence unusable pieces (Irvine 2002). Over the years, researchers have been able to get around this problematic situation by constructing a strain of *E-coli* cells in which such enzymes are not present (Gregory 2001). Unfortunately and accidentally, the cells used in the second *E-coli* transformation (TFM-9) had been constructed incorrectly. The result was that modifications were cut beyond repair in that second transformation. This part of the experiment is easily repeatable but takes a great deal of extra time to complete again.

Unfortunately, the other half of the experimentations provided problems as well. As shown in Figure 3, the goal of several crosses was to obtain a strain which would be little a mating type, and therefore Sad-1, but also contain the *mus::52-bar+* mutation. Previous studies, however, have shown the *mus::52-bar+* mutation to be sex-linked, a trait overlooked in the planning of this experiment. The linkage to the y-chromosome and thus the A mating type of this mutation is not strict (not 100% in all cells) but is significant enough to drastically reduce the hope of obtaining such a strain without picking more than 1000 colonies for the second cross and many more for the third, fourth, and fifth. Recent research has indicated this sex linkage in *neurospora crassa* since the mutation's conception several years ago, and this study further supports such results. This finding is important in combination

with other research involving the *mus::52-bar+* mutation but is nothing new and is unimportant in increasing the knowledge of gene regulation. The solution to this situation is either to pick and grow an almost unworkable number of colonies testing each for the correct genotype, or to take strains of the opposite mating type and test for the *Sad-1* mutation in big A mating types. The route to be taken will be worked out for future studying of this topic.

Supplemental Materials

Appendix I: Glossary

Ascospores: The result of sexual reproduction in *neurospora*. These black spores are microscopic and shoot from fully matured pariticia.

Base-pair: The sequence in DNA is made up of base pairs of the nucleotides adenine, thymine,

guanine, and cytosine. (A pairs with T) and (C with G). Numbers of pairings are useful measurements of DNA length.

Chromatin: The structure of DNA and Proteins (primarily histones) housed in the nuclei of Eukaryotic cells.

Core histone: Any of the four histones (H2A, H2B, H3, H4) which comprise the histone octet.

CpG site: Site along the DNA strand where a guanine follows a cytosine base. DNA methylation occurs primarily at these sites.

C-terminal tail: hydrophobic region at the terminal end of any protein.

DIM mutation: Any genetic mutation causing a defect in the global DNA methylation process.

DNA: Deoxyribonucleic acid. The physical structure of the gene code found in the nucleus.

DNA Methylation: The addition of a methyl group to a cytosine base.

Eukaryote: Cells more complex than those of bacteria and archaea containing numerous organelles and a membrane bound nucleus.

E-coli: A bacteria widely used in research for its simplistic genomic structure.

Gene: The units of heredity in living organisms.

Gene silencing: The process on “turning off” the expression of specific genes.

Growth factors: Any protein capable of facilitating some aspect of cell division.

Histone: Any of a family of proteins found in the nucleus of eukaryotes which function in the DNA packaging of chromatin.

Histone acetylation: Addition of an acetyl group to a residue on the histone n-terminal tail.

Histone methylation: Addition of a methyl group to a residue on the histone n-terminal tail.

Histone octet: The structure of core histones around which DNA is wrapped in the nucleosome.

Histone phosphorylation: Addition of a phosphate group to a residue on the histone n-terminal tail.

in-vitro: Experimentation in a controlled environment outside the organism.

in-vivo: Experimentation of phenomena occurring inside the organism.

Mating type: The designation of male or female, or the equivalent a or A, as gender.

Methyltransferase: An enzyme (protein) which is responsible for the addition of a methyl group to a competent region of another molecule.

Meiosis: Sexual reproduction of cells involving the fusing to nuclei of opposite mating types.

Mitosis: Asexual reproduction of cells involving a direct clone by cellular division.

Neurospora Crassa: A fungal eukaryote often used in research for its simplistic genomic structure and useful applicability to higher organisms.

Nucleosome: The structure of 146 base pairs wrapped around an octet of histone proteins. This is the fundamental unit of chromatin.

N-terminal tail: The hydrophilic structure at ending with the n-terminus on a protein.

Paraticia: The black bulbous sexual structures of *neurospora crassa*. It is semi-visible to the naked eye. Ascospores shoot from the tube-like "beaks" at the top of each pear shaped structure.

PCR: Polymerase chain reaction. Using specific primers to amplify genes a large amount of desired DNA can be obtained in a relatively short time.

Plasmid: A circular strand of DNA, often found in bacteria, which does not code for any vital proteins in the organism.

Residue: The basic subunit of proteins. Proteins can be composed of thousands of residues bonded together in a long chain.

Restriction endonuclease: Any of a family of enzymes capable of cutting DNA at specific sites in the genome.

RIP mutation: Repeat induced point mutations are mutations of methylated DNA in which

Nonsense substitutions of base pairs are made by DNA repair mechanisms. Generally causes deactivation of genes.

Southern Blotting: The process of running DNA out on an agarose gel before transferring it to membrane which can be probed by various radioactive isotopes for specific traits of the DNA to be analyzed.

Transcription: The process by which RNA is constructed using a DNA coding template.

Translation: The process by which proteins are constructed from the RNA code.

Viability: Ability of an organism to live under different environmental circumstances.

Wild type: An organism possessing the dominant gene of a given set of alleles.

Yeast: An organism useful in research for its ability to clone plasmid DNA.

Appendix II: Raw Data and Abstract Findings

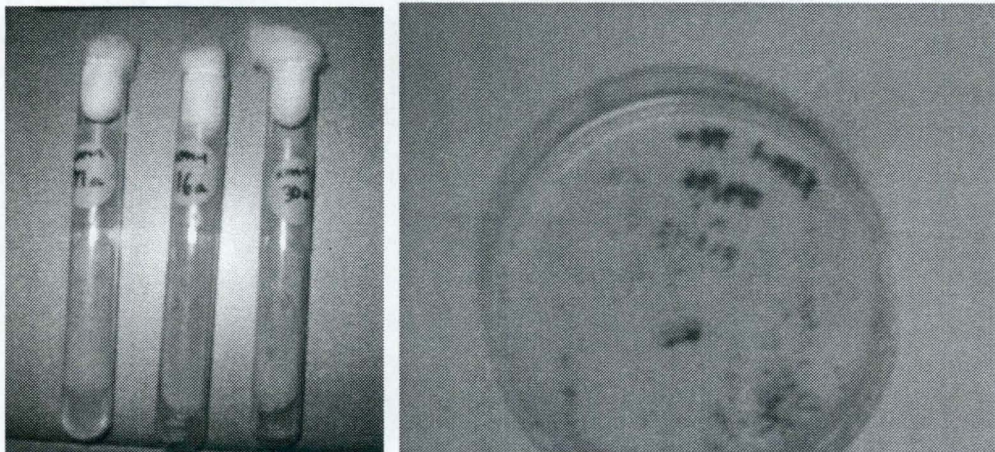


Figure 4: Parititia Growing on Crossing Medium From XFM-1 (Right) and Correct Strains Grown From Specific Colonies of XFM-1 (Left).

amrip8 Cut Site Map
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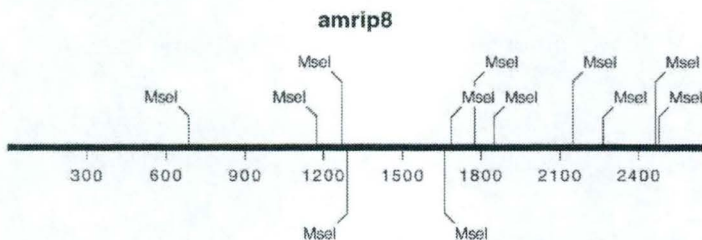
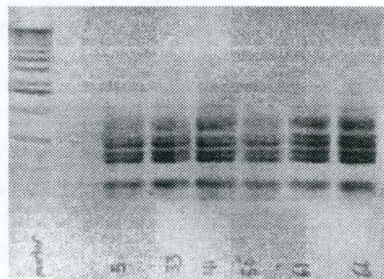


Figure 5: To test PCR products for the correct genotype, DNA from crosses, was cut with MseI which has a great number of cutting sites in the amrip8 region. In a genotype where the amrip8 gene is not present only one band of DNA would be observed on a gel.



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Early Parental Presence and Self-Other Overlap: An Empirical Examination of Chodorow's Theory of the Reproduction of Mothering

by John E. Myers
Psychology

Faculty Mentor: Sara Hodges, Psychology

Abstract

This study was inspired by Nancy Chodorow's (1978) Theory of the Reproduction of Mothering (TRM). The study empirically scrutinized Chodorow's hypothesis that male-dominant, father-absent societies in which women do most of the parenting for children of both sexes reproduce themselves by creating dissimilar atmospheres in which young girls and boys develop their gender identities. According to Chodorow, these disparate atmospheres make women view themselves in relationship to others and, in contrast, making men view themselves as separate from others. Ninety college students completed a battery of pen and paper measures that included, among other things, measures of self-other overlap and parental egalitarianism. Although TRM was not supported, parental egalitarianism correlated with increased perceptions of self-other overlap with both parents regardless of whether the subject was male or female. Further, parental egalitarianism was associated with decreased perceptions of self-other overlap with close others in males.

Introduction

Everyone has a set of heuristics that helps to categorize any individual as being either male or female. Some of these rules of thumb are biological and almost universal. Other indicators of gender are behavioral—more products of society than biology. While some people believe that many behavioral differences between men and women are primarily biological, most would concede that socialization also plays an important role in the development of gender-specific behaviors. One particularly interesting difference between males and females is found in parental involvement: women tend to be more involved in the lives of their children than men. This might be the most intuitively biological behavioral gender difference, but to what extent do social forces foster the gendered division of parental responsibilities? Nancy Chodorow (1978) has posited that social factors are paramount in creating gendered differences in parenting. However intriguing her theory is, few empirical studies have tested its elements.

In *The Reproduction of Mothering: Psychoanalysis and the Sociology of Gender* (1978), Chodorow attempted to explain how behavioral differences between men and women come about. Her Theory of the Reproduction of Mothering (TRM) states that male dominant, father-absent societies in which women do all or most of the parenting for children of both sexes “reproduce” themselves. Chodorow proposes that this occurs because the absence of a father in the modern patriarchal family unit creates different atmospheres in which young boys and girls develop gender identities.

According to the theory, young boys lack a same sex primary caregiver with whom to identify at the time that their gender identities are developing. When they realize that their mother is a different

sex from them, they feel a need to reject her as a model, although she is the person who has, in most cases, performed the bulk of their nurturing. Consequently, boys learn to identify themselves as being different or separate from others. Furthermore, Chodorow proposed that rejecting one's mother and, by extension, all things feminine (e.g., nurturance), leads to a definition of masculinity characterized by little more than the rejection of femininity. This identity hinders how males relate emotionally to other people, and thus encumbers their ability or willingness to tend to their own children's emotional needs, while priming them for work outside the home.

Young girls, on the other hand, have access to a same-sex primary caregiver and are thus able to develop their gender identities much less traumatically than their male counterparts. As a result, females come to identify themselves in relation to others as they develop into adulthood, making them much more prepared and willing to care for their own children. Accordingly, the odds that a woman will eventually do all or most of the parenting for her children are greatly increased (Chodorow, 1978).

According to Chodorow's reasoning, relational differences between males and females should be apparent as soon as children can understand which gender they are. Some research has shown that girls and boys as young as 53 months (under five years of age) differ in how they present themselves in photographs taken with infants. Specifically, girls tend to smile at, touch and stand closer to infants (especially when pretending to be an infant's parent) than boys. In fact, boys tend to stand farther away from infants once they begin pretending to be an infant's parent (Reid, Tate, & Berman, 1989).

While it is likely that preschool children learn parenting

behaviors through the observation of their own parents, TRM would also cite disparities in the availability of a same-sex parent in the familial environment of young girls and boys to explain these behavioral differences. Lending some support to TRM, Williams, Radin, and Allegro (1992) found that individuals tend to have less traditional attitudes about employment and childrearing with increased paternal involvement. Also, individuals (especially boys) tend to report high paternal involvement as being advantageous (Williams, *et al.*, 1992). Could it be that increased parental egalitarianism leads to more similarities in how boys and girls develop their gender identities and, thus, less polarized views of male/female gender roles, as would be predicted by TRM?

As it turns out, paternal emotional involvement has been associated with greater femininity in both male and female children (Deutsch, Servis, & Payne, 2001). It is reasonable to assume that paternal emotional involvement might be related to children's preference for feminine activities because fathers who are more emotionally involved with their children might themselves be more feminine and, thus, provide a more feminine role model for their children. However, TRM might postulate that emotional identification with fathers, especially in male children, leads to a decrease in rejection of femininity (i.e., masculinity) and, thus, an increase in femininity.

Empirical studies have shown that very early in their development boys are generally less relational than girls and that greater paternal involvement fosters greater femininity with more egalitarian attitudes about gender roles. Generally, these effects have been accounted for by prior researchers within the context of social learning and modeling. Duindam and Spruijt (2002),

however, ran one study within the framework of TRM and found that males who were inspired by their own fathers' parenting tended to spend more time with their children and that males who maintained a strong relationship with their own fathers tended to be more likely to continue performing more childcare throughout their children's development.

These findings are exactly what would be predicted by TRM. Despite empirical studies that show support for TRM, the theory has not gone without criticism. In fact, it is a hotly debated concept that is easily explained away with manifold confounding variables. For example, it could be that an egalitarian father will raise an egalitarian son, not because of his son's ability to develop his gender identity in an optimal environment, but because egalitarian families socialize their children differently from traditional families. In addition, the findings of several studies have refuted TRM. For example, Sabattini and Leaper (2004) found no differences in gender attitudes between participants from traditional and egalitarian families. This was true when household labor was defined as childcare and housework together, housework alone, or childcare alone.

The most salient problem for TRM is that it has yet to be verified empirically, whereas the more widely accepted theories of gender role development have been studied quite extensively. While the predictions made by TRM are rarely tested explicitly, they are often indirectly supported by researchers who study gender role development in other contexts. Indeed, many of the studies cited here to support TRM employed some other cognitive theory of gender development as their basis.

Two theories that compete with Chodorow's explanation of gender role differences are social cognitive theory (Bussey,

& Bandura, 1999) and gender schema theory (Martin, Ruble, & Szkrybalo, 2002). Both of these theories state that children learn their gendered behaviors through the observation of male and female role models, but the theories differ in their explanations of how this learning occurs.

Gender schema theory states that children categorize people as being either male or female by forming gender schemas that they derive through the observation of people around them. A gender schema is a set of mental representations that provides information about gender and about one's self. According to the theory, all that is necessary for a gender schema to develop is the formation of a gender identity and the ability of a child to associate certain traits and behaviors to a particular sex. The theory claims that gender schemas, once formed, allow children to categorize people, including themselves, as being either male or female, using increasingly abstract heuristics (e.g., interests, personality, and salient emotions) as they develop. Through this categorization process, some gender differences are exaggerated, or possibly even fabricated. The theory posits that these gender schemas are generally adaptive because they allow us to better remember, and recognize people of a particular sex while also providing us with information about how individuals of a particular sex should act (Martin, *et al.*, 2002).

Gender schema theory implies that individuals learn gender appropriate traits and behaviors almost exclusively through observation. Thus, according to this theory, increased paternal presence might lead to differences in gender role attitudes, not because individuals from egalitarian families had male care givers with whom they relate and identify, but because fathers

in egalitarian family units might be very different models than absent fathers. The most apparent divergence between TRM and gender schema theory is that, according to TRM, increased paternal involvement should have dramatic effects on gender role attitudes and how individuals relate. Gender schema theory, on the other hand, might predict fewer differences between individuals from traditional and egalitarian families, because the presence of a father only provides children one additional model to observe.

Bussey and Bandura (1999) developed a social cognitive theory of gender development in an effort to integrate the concepts of more narrow theories into one unified whole. Their social cognitive theory states that the process of evolution affects our gender development, but, rather than dictating our gendered behaviors, evolution's role in gender development represents potentialities.

For social cognitive theory, the environment in which we develop plays a much more important role in gender development than does biology. Social cognitive theory argues that there are three kinds of environments. The *imposed* environment is forced upon us. An example would be a child who has little control over whether to go to school. The *selected* environment constitutes the actual experienced environment. We choose with whom we socialize, to what we pay attention, our goals and hobbies. Finally, we create our *constructed* environment through intentional generative efforts. For example, children construct a play environment by choosing playmates, play activities, and rules for the play activities. Thus, the environment, too, presents a set of potentialities over which we have ample control.

Social cognitive theory also posits that there are three modes of influence on gender differentiation. The first and most basic mode

is *modeling*. Peers, parents, and the media all portray how males and females act, and children are able to understand and learn these models from a very early age. The second, and somewhat less efficient mode of influence, is *enactive learning*. Children glean information about gender appropriate behaviors through the observation of the outcomes of their actions. If a parent or peer reacts negatively to a particular gendered behavior, the child learns that it is one that he or she should not continue. Finally, *direct tuition* is the verbal communication of gender appropriate behaviors. This mode is, in many ways, a combination of the two others and is much more direct. Yet, it is also less efficient than modeling because of the abstract nature of language and the difficulty that young children have comprehending what is being said to them.

Given the complexity of social cognitive theory and its view of gender role development, increased paternal involvement might have little effect on the development of one's gender identity. As with gender schema theory, social cognitive theory is unable to establish the relationship between increased paternal involvement and its influence on one's developing gender identity. Rather, the effects of paternal involvement may be highly variable depending upon the femininity/masculinity of the father and the influence of several equally important confounding variables. TRM, on the other hand, claims that increased paternal involvement will universally lead to a decline in gender polarization, regardless of a father's personality, by providing males with a same-sex primary caregiver with whom to identify, while dampening extreme maternal identification in females.

Both of these two cognitive theories of gender development are

valid and widely held, but it is difficult to resist the allure of TRM with its psychoanalytic approach. TRM stands alone in describing the systemic, social, and cognitive factors that lead to the persistence of gender-role inequities not only in psychological terms, but also in activist, sociological terms. In other words, not only does TRM explain gender-role inequalities, it also provides possible solutions to them.

Testing some of the tenets on which TRM is based, in particular the correlations between paternal involvement and self-other overlap, may help determine the validity of TRM. That is so because measures of self-other overlap are accepted as operationalizations of how individuals relate to and identify with others.

Aron, Aron, Tudor, and Nelson (1991) demonstrated how close relationships can be gauged by measuring levels of self-other overlap. They performed three experiments to determine the correlation between self-other overlap and relationship closeness. In their first experiment, recruited college students were instructed to allocate money to a close friend or a stranger. In one condition, the subjects were told that the friend/stranger would not know how the money was allocated. In another condition, the participants were told that the friend/stranger would know how the money was allocated. Aron *et al.* (1991) found that while there were no effects for gender or whether the other knew how the money was allocated, there was a significant effect for close friend versus stranger, with more money allocated to the close friend. To investigate this result further, the researchers did a follow-up study using most of the same procedures, but instructing participants to allocate money to a disliked other. Also, the researchers left out the variable of "other will/will not know how the money was allocated." Again, there

were no effects for gender, but there were significant effects based on how the participant viewed the other. The researchers found a significantly greater difference between allocations to the friend and stranger than the difference between allocations to the disliked other and stranger.

The researchers pointed out that these two findings, taken together, indicate that providing greater rewards to friends cannot be explained by the friend's potential reciprocity, in that the friend, in some cases, did not know how the money was allocated, a factor that had no effect on how participants allocated the money. Second, because the close friend did not put forth any effort in the study the allocation of money was not based on a desire to maintain equity. . Rather, Aron *et al.* (1991) concluded that we perceive the resources of close others as if they were, to some extent, our own resources. They reached this conclusion by indicating that if liking alone was the factor that determined how the money was allocated, the difference between the allocation of money between a friend and a stranger and between a disliked other and a stranger should have been more similar. They point out, however, that they may have attained these results because participants liked their friends more than they disliked their disliked others.

Another study that explored the association between relationship closeness and self-other overlap (Aron *et al.* 1991) presented twenty female college students with 60 concrete nouns, each for 10 seconds. While the participants viewed each of the 60 nouns, they were asked to form a vivid image of one of three target persons interacting with the item to which the noun referred. The target persons that the subjects were asked to imagine were themselves, their mothers (i.e., a close other), and Cher, a well-

known female entertainer who, at the time of the study, would have been about the same age as the participants' mothers. After each noun was presented for 10 seconds, the subjects wrote down their image before the next noun was presented. After all of the nouns had been presented, the subjects were given 5 minutes to write down as many of the nouns as they could remember in a surprise memory test. The researchers found that subjects remembered a significantly greater number of nouns with Cher than the number of nouns they recalled with their mother. Furthermore, Aron *et al.*, found that the difference between the number of nouns recalled with mother and self was not significant.

Aron *et al.* (1991) posited that there is a difference between how we perceive others and ourselves in our physical world. That is to say, we see the entire body of another person—*i.e.*, as a “figure,” rather than just our hands or other body parts that we would see in the perception of ourselves, the “ground.” Aron *et al.* claim that this perceptual difference makes our mental representations of others interacting with some object more salient, and thus easier to recall. However, if this phenomenon were strictly perceptual, one would expect more similarity between nouns recalled with Cher and nouns recalled with one's mother. The experimenters hypothesize that this difference could indicate that while imagining one's self or one's mother (or anyone with whom we are extremely close), the target person is perceived as being more “ground-like.” On the other hand, when the target person is a prominent entertainer, the target is perceived as being more “figure-like.”

To ensure that the difference in the number of nouns remembered for one's mother and Cher was not an artifact of Cher's novel and flashy persona, the researchers re-ran the experiment using seven

female subjects who had lived with their mothers within the last two years. In this study, each subject was instructed to imagine one of her mother's friends rather than a prominent entertainer. Also, the researchers asked that the selected friends be ones with whom the subjects were not close. The results were similar to those of the original study. Subjects recalled more nouns associated with their mothers' friends than they did for their own mothers. Again, there was no significant difference between the number of nouns recalled for a subject's mother and a subject's self. Furthermore, the researchers found that the difference between nouns recalled for mother and mother's friend was strongly related to closeness with mother ($r = .56$).

The results of these studies seem to show that subjects tend to perceive individuals with whom they have a close relationship as "self-like." The researchers concede, however, that the small sample sizes of the two studies detract from the strength of their findings. Also, there might be other explanations for their results. For example, it could be that fewer nouns were recalled for one's mother because it requires less effort to imagine her. The researchers dismiss this explanation, however, by pointing out that it should be just as easy to imagine Cher interacting with an object because, as a prominent entertainer, this is how she is almost universally perceived in the physical world.

Finally, in their third experiment, Aron *et al.* (1991) revealed a confusion of the self with a close other. Ten (8 women) married graduate students were asked to complete a questionnaire while they were waiting for a social psychology seminar to begin. The questionnaire had subjects rate how much 90 traits applied to themselves, their spouses, and Bill Cosby. After they finished the

questionnaire, they attended the seminar and were called out of it individually sometime between 15 minutes and 2 hours from its start. The seminar served as a distraction task. When participants were called out, they then completed a computer task in which they were instructed to indicate as quickly as possible whether each of the 90 traits applied to themselves. Researchers presented the set of 90 adjectives to each subject three times, with the traits listed in random order each time. The computer recorded responses and response times.

The results showed that individuals took longer to respond to adjectives for traits which were dissimilar to their spouses than to respond to adjectives they shared with their spouses. Aron *et al.* also analyzed data from response errors—those adjectives that subjects reported as being representative of the self on the questionnaire, but were not reported as such during the computer task. Consistent with the previous finding, the results showed that subjects made more errors with adjectives when they perceived differences with their spouses than with adjectives when they perceived shared qualities.

The findings of this study seem to show that subjects had trouble separating their representations of themselves from their representations of their spouses. It appears that the subjects had difficulty perceiving a trait that applied to their spouses as not applying to themselves. The researchers point out, however, that these results may have occurred because more mundane traits may have been reported for self and spouse than for Bill Cosby. They re-ran the study with ten additional people (4 women). In this follow-up experiment a friend of the subject's spouse was used as the third target rather than Bill Cosby. The results showed that

the differences in reaction time for traits that were similar to the participant's spouse lacked significance, although the results were in the same direction. Recognizing the gender difference between the samples taken in the two experiments (8 women in the first, 4 in the second), the researchers analyzed the data for just the four women in the second study. The researchers found that the longer response times to traits dissimilar to spouse were significant, but the results were unreliable because of the small sample size (Aron *et al.*, 1991).

The results from the three experiments presented in Aron *et al.*'s (1991) article are compelling and demonstrate that the closer one is to another individual, the more "self-like" that other individual becomes. Using the phenomenon of self-other overlap as a measure of how individuals relate to others, it becomes possible to examine one of the most important tenets of TRM. Therefore, to test TRM's assertion that males and females will vary in how they relate to others depending upon both maternal and paternal presence, I formulated four hypotheses with regard to paternal involvement and self-other overlap. First, on average, participants should perceive less self-other overlap with their opposite-sex parent than with their same-sex parent, as the same sex should provide more overlapping qualities for self and the parent. Second, males should show less self-other overlap with their mothers than females do with their fathers. In both cases, overlap should be reduced because it is with the opposite sex parent, but males should show less overlap with their mothers, as a result of rejecting their mothers as models for sex-typed behavior, whereas females, according to TRM, are not required actively to reject their fathers' masculinity. Third, because male participants should generally have learned to avoid nurturing

and closeness relative to female participants, the male participants will perceive less self-other overlap than female participants will perceive with the person with whom they are the closest, other than their parents (e.g., a close friend or significant other). Finally, the differences described above will be dampened among participants whose parents shared parenting responsibilities equally. That is to say, male and female participants whose parents shared parental responsibilities more equally will show less of a discrepancy between their overlap with their mothers, fathers and close other.

Method

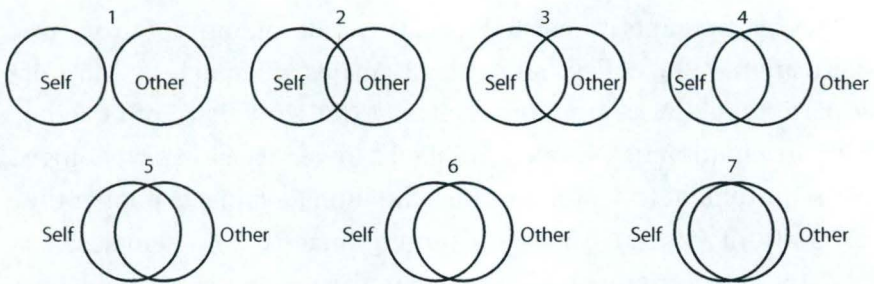
Participants

The participants consisted of 90, predominantly European-American ($n = 67$), college students (31 males, 59 females). Most of the participants were undergraduates at the University of Oregon; their participation in the study satisfied a lower division psychology class requirement ($n = 80$). Because the human subjects pool at the University of Oregon consists of approximately 70% females, 10 male student participants were recruited from the same pool but were paid \$10 for their participation.

Design and Materials

After granting their informed consent, participants, in groups of one to five, completed an hour-long questionnaire followed by a debriefing with the researcher. The questionnaire included two measures of self-other overlap. The first measure was a checklist of 114 adjectives based on a list used by Davis, Conklin, Smith, and Luce (1996). The participants completed lists for themselves and each of their parents. Also, each participant completed a list for a self-selected person with whom that participant was the closest

(relationship noted). The purpose of this measure was to gauge levels of perceived self-other overlap by determining the number of shared adjectives participants report having with each of the three target individuals. The second measure of self-other overlap was Aron, Aron, and Smollan's (1992) *Inclusion of Other in the Self (IOS) Scale* consisting of seven pairs of circles that overlap to varying extents. Participants completed that measure for each of the three target individuals by choosing which of the seven pairs of overlapping circles best represented their relationships with each of the three targeted individuals (both parents and the self-selected person). (see Figure 1).



Please circle the picture which best describes your relationship with the PERSON WITH WHOM YOU ARE THE CLOSEST OTHER THAN A PARENT (e.g. best friend ore significant other)

How would you describe your relationship with this person (e.g., best friend, spouse, boy/girlfriend)?

Figure 1: Example of Aron *et al.*'s (1992) "Close Other" Inclusion of Other in the Self (IOS) Scale.

To minimize demand characteristics, the adjective checklist for self was the first task completed by each participant. Also, given the limited time participants had to complete the questionnaires, the various other measures completed before the participants reached

the adjective checklists for the three target individuals served as distracter tasks. Participants completed a wide range of other scales, including the *Adult Attachment Questionnaire* (Simpson, Rholes, & Phillips, 1996), the *Personal Attributes Questionnaire (PAQ)* short scale (Spence, Helmreich, & Stapp, 1974), and the *Gender Role Conflict Scale* (O'Neil, Helms, Gable, David, & Writsman, 1986).¹ These scales were used to gauge levels of androgyny and attachment style.

Participants also completed a *Parental Involvement Scale* created specifically for this study. This Likert scale asked participants to rate how their parents divided five facets of childcare—discipline, emotional support, play, physical care, and time spent with the child—at three periods during the participants' youth (birth to 5-years-old, 6- to 10-years-old, and 11- to 18-years-old). A score of 1 indicated that a particular duty was performed much more by a participant's mother; a score of 7 indicated that a particular duty was performed much more by a participant's father; and a score of 4, the mid-point of the scale, indicated parental egalitarianism. Only the retrospective measure of parental egalitarianism from birth to age five was used in this study because it is the most theoretically important measure of parental egalitarianism in testing the predictions made by TRM. In order to attain more equal cell sizes, a median split was employed to distinguish between participants who were raised in families with high paternal involvement versus low paternal involvement. The median was 3.4, whereas the midpoint of the scale—representing equal contributions from both mother and father—was 4. Thus, the “egalitarian” label that is used in the analyses that follow is a relative term. Among subjects in the egalitarian group, there were some with families that were actually

slightly more maternally oriented, some truly at the “egalitarian” midpoint, and yet others who were more paternally oriented. Finally, each participant completed a demographic questionnaire. In addition to collecting data on age and ethnicity, the demographic questionnaire asked participants to explain the structure of their families throughout their lives (see Appendix 1).

Results

Aron *et al.*'s IOS data were analyzed using a 2 (participant gender) x 2 (family type, egalitarian versus traditional) x 2 (target parent, which was within-subjects) within-between ANOVA. (See Table 1 for means and standard deviations of parental IOS scores by gender and family type; see Figure 2 for a bar graph of these

Group	Mean Maternal IOS Score and Standard Deviation	Mean Paternal IOS Score and Standard Deviation	Mean Close Other IOS Score and Standard Deviation
Male – Traditional Household	M = 3.78, sd = 1.52	M = 2.56, sd = 1.25	M = 5.56, sd = 1.42
Male – Egalitarian Household	M = 4.85, sd = 1.72	M = 4.45, sd = 1.76	M = 4.38, sd = 1.50
All Males	M = 4.23, sd = 1.67	M = 3.38, sd = 1.76	M = 5.06, sd = 1.55
Female – Traditional Household	M = 4.06, sd = 1.63	M = 2.78, sd = 0.94	M = 5.40, sd = 1.54
Female – Egalitarian Household	M = 4.85, sd = 1.90	M = 4.41, sd = 1.69	M = 5.78, sd = 1.37
All Females	M = 4.42, sd = 1.78	M = 3.52, sd = 1.56	M = 5.58, sd = 1.46

Table 1: Means and standard deviations of participants' maternal, paternal and close other IOS scores (means can range from 1-7).

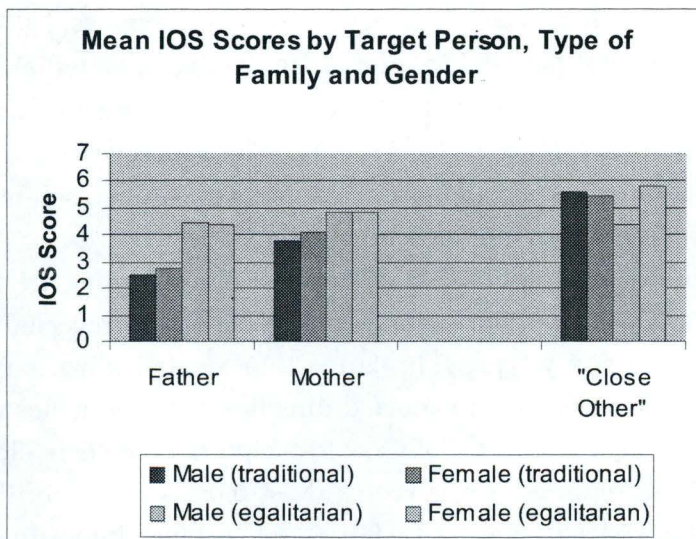


Figure 2: Mean IOS scores by target person, type of family and gender.

means.) One main effect related to family type, with participants from egalitarian families reporting greater closeness with their parents, $F(1, 86) = 22.68, p < .001$. Overall, subjects perceived greater self-other overlap with their mothers than with their fathers, $F(1, 86) = 17.00, p < .001$. This difference was marginal in males, $t(60) = 1.9, p = .06$, but significant in females, $t(116) = 2.91, p = .004$. Both these effects were moderated by the interaction of the target-parent and family-type variables, $F(1, 86) = 4.92, p = .03$. Parental IOS scores showed no significant difference in males, $t(24) = .45, p = .66$, or females, $t(52) = .91, p = .37$, who came from egalitarian families. In traditional families, however, both males and females reported greater closeness with their mothers (respectively, $t(1, 31) = 2.86, p = .008$; $t(1, 59) = 3.69, p = .001$). The data suggest that being raised in an egalitarian family significantly increases paternal

IOS scores in males, $t(29) = -3.68$, $p = .001$, and females, $t(57) = -4.65$, $p < .001$, but parental egalitarianism increases maternal IOS scores with only marginal significance in males, $t(29) = -1.83$, $p = 0.08$ and females, $t(57) = -1.72$, $p = 0.09$. The data reveal no main effect for participants' sex in their perceptions of parental self-other overlap, and there were no other interactions.

In addition, a 2 (participant gender) $\times$ 2 (family type) ANOVA test on the IOS scores for participants' close-others revealed no main effect by family type, $F(1, 86) = 1.49$, *ns*, but a marginally significant difference in the expected direction between males and females was apparent in the IOS scores reported for their close-others. Males reported lower scores ($M = 5.06$, $sd = 1.55$), than females ($M = 5.58$, $sd = 1.46$), $F(1, 86) = 3.60$, $p = .06$. Interestingly, the data showed an interaction between participant gender and family type, $F(1, 86) = 5.54$, $p = .021$. Aron et al's (1992) IOS Scale revealed that being raised in an egalitarian household significantly *decreased* close-other IOS scores in males (traditional $M = 5.56$, $sd = 1.42$; egalitarian $M = 4.38$, $sd = 1.50$), $t(29) = 2.21$, $p = .04$, while having no significant effect on close-other IOS scores in females (see Table 1 for means and standard deviations of close-other IOS scores by gender and family type and Figure 2 for a bar graph of these scores).

Comparing the number of matched adjectives between participants and each of their target individuals revealed some significant correlations. Those matches could be either positive (participants checked the adjective for themselves and the target individual) or negative (participants did not check the adjective either for themselves or the target individual). An analysis of participants' adjective checklists showed that parental IOS scores

and parental adjective overlap were significantly correlated for mothers, Pearson's $r = .22$, $p = .034$, and for fathers, Pearson's $r = .26$, $p = .014$. In contrast, the correlation between close other IOS scores and adjective overlap between self and close-other was not significant (Pearson's $r = -.017$, $p = .87$). Further analysis of adjective overlap showed that parental egalitarianism had no significant effect on maternal, paternal, or close-other adjective agreement in males or females. For males, however, these effects, while not significant, were in the predicted direction—that is, greater overlap for male participants from egalitarian families—for maternal, $t(29) = -1.46$, $p = .16$; paternal, $t(29) = -1.61$, $p = .12$; and close other, $t(29) = -1.62$, $p = .12$ adjective overlap. (See Table 2 for means and standard deviations.)

Maternal Agreement, Traditional Household	M = 77.5, sd = 9.97
Maternal Agreement, Egalitarian Household	M = 83.85, sd = 15.18
Paternal Agreement, Traditional Household	M = 75.83, sd = 10.15
Paternal Agreement, Egalitarian Household	M = 82.67, sd = 13.92
Close Other Agreement, Traditional Household	M = 78.44, sd = 10.15
Close Other Agreement, Egalitarian Household	M = 84.92, sd = 12.10

Table 2: Means and Standard Deviation for Male Participants' Paternal Adjective Agreement by Familial Organization (means can range from 0-114).

Simpson *et al.*'s (1996) *Adult Attachment Questionnaire* showed no effects or interactions for gender or parental egalitarianism on levels of avoidance, but males were significantly more ambivalent ($M = 33.74$, $sd = 8.16$) than females ($M = 28.91$, $sd = 8.85$) across levels of parental egalitarianism, $F(1, 86) = 6.82$, $p = .011$. Levels of ambivalence in males who were raised in traditional households did not differ significantly from males who were raised in egalitarian households. There were no other main effects or interactions on ambivalence. O'Neil, Helms, Gable, David, and Writsman's (1986) *Gender Role Conflict Scale* indicated that parental egalitarianism had no significant differences between males and females on such measures as emotional restrictiveness, competitiveness/desire for power, or degree of homophobia. Spence, Helmreich, and Stapp's (1974) *Personal Attributes Questionnaire* revealed that parental egalitarianism had no significant effect on the levels of masculinity or femininity among males and females.

Discussion

The central research hypothesis was that participants should perceive less self-other overlap with their opposite-sex parent than with their same-sex parent and that males should show less self-other overlap with their mothers than females do with their fathers, but the data seem to indicate that both male and female participants generally perceived significantly greater levels of self-other overlap with their mothers than with their fathers. When one takes levels of paternal involvement into account, however, the picture changes somewhat. According to the results of the current study, participants from traditional families tended to perceive significantly more self-other overlap with their mothers than with

their fathers. Participants from egalitarian families, on the other hand, perceived nearly the same amount of self-other overlap with both parents. This finding can be explained without much reflection: when participants' fathers shared parental responsibilities more equally, participants developed relationships with their parents that were equally close. This straightforward explanation, however, is complicated by the fact that male and female participants from egalitarian households perceived greater self-other overlap with *both* parents than participants from traditional households. One general expectation is that both males and females would perceive greater self-other overlap with involved fathers than absent fathers, but the current research offers no way to explain why greater paternal involvement increased maternal IOS scores. Although the maternal IOS score increase in participants from egalitarian families was only marginally significant in both males ($p = .08$) and females ($p = .09$), it is a compelling finding that warrants some attention.

Chodorow might claim that males from egalitarian families were closer to their mothers than males from traditional families because having access to a same-sex caregiver made them more relational and less rejecting of their mothers' femininity. That position, however, falls short of an adequate explanation. Specifically, TRM fails to explain why females from egalitarian families should perceive greater maternal self-other overlap than females from traditional families. In fact, TRM would predict that females from egalitarian families would perceive less overlap with their mothers than females from traditional families.

Although many of the findings of the current study cannot be explained by TRM, they might be accounted for in a variety of other ways. One possible explanation that fits with the data is that

families in which fathers dedicate themselves to child rearing might be inherently “closer knit” than traditional families. With access to a same-sex parent, males might feel more inclined to participate in familial activities rather than turn to peer groups for recreation and support. Thus, these males would have more exposure to their mothers and, in turn, develop closer relationships with them. More difficult to explain is why increased paternal involvement was associated with higher maternal IOS scores in females. Perhaps the regular presence of a father in the family unit increases the likelihood that all of the members of a family will frequently interact with each other. It is possible that “complete” families play or eat at the dinner table together often, whereas, members of “incomplete” families feel more independent from the family unit, and thus, turn to peer groups more frequently for social interaction, a shift that may lead to lower parental and higher close-other IOS scores.

The finding that males reported lower close-other IOS scores than females, while only of marginal significance ($p = .06$), seems to support the hypothesis that male participants should perceive less self-other overlap than female participants with the individuals with whom they are the closest. Males from egalitarian households, however, reported significantly lower close-other IOS scores than males from traditional families. This runs in stark contrast with what TRM would predict. Perhaps, once again, males from egalitarian families relied less on peer groups than males from traditional families who would have less experience with cultivating close relationships with individuals outside of their family unit. Females from traditional and egalitarian families, however, did not differ in close-other IOS scores. The difference in the effect of parental egalitarianism on close-other IOS scores

in male and female participants might simply be a function of socialization. That is, females might be socialized to foster close relationships outside of the family unit more than males, regardless of levels of parental egalitarianism (or familial closeness). The finding that male participants were significantly more ambivalent in terms of attachment than female participants, regardless of the extent of their fathers' involvement, supports this idea to some extent. The finding that close-other adjective agreement and IOS scores were uncorrelated, while parental adjective agreement and IOS scores were correlated, lends further support to this position.

Finally, the finding that parental egalitarianism had no effect on trait measures of masculinity, femininity, competitiveness/desire for power, emotional restrictiveness, or homophobia for either males or females undercuts support for TRM.

Although the current study reveals some significant correlations, raises questions about the validity of TRM, and posits some avenues of further research, it suffers from three major limitations. First, only 31 males participated in the study. This small sample detracts from the strength of the study's findings. Second, the median split used to distinguish traditional families from egalitarian families was not an optimal method of differentiation. Using the median split, the score that indicated parental egalitarianism was 3.4. However, the actual score that theoretically indicated parental egalitarianism was 4.0. Thus, rather than indicating whether a participant was from a truly egalitarian family, the median split simply indicated whether a participant was from a more egalitarian family. Finally, the data collected for parental involvement was retrospective and used a new measure that has yet to be validated. As it is unlikely that participants actually remembered how their parents divided

parental responsibilities from their birth until they were five years old, a considerable degree of guesswork may have gone into participants' reports of parental involvement.

Despite these limitations, the current study seems to show that paternal involvement may have some impact on how males and females relate to their parents and close-others. Many of the findings of this study, however, cannot be explained within the framework of TRM, and in some cases, the findings actually refute that theory. More research needs to be conducted to identify how and why paternal involvement affects the ways in which individuals relate to the people with whom they are the closest.

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Notes

¹ Participants also completed the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979), and the Attitudes Toward Women Scale (Spence, & Helmreich, 1972). The data collected from these two scales were not analyzed. An unpublished Gender Traits and Behavior Scale developed by Laurent (2005) was also completed by participants. The data gathered from Laurent's scale was not analyzed in the current study, but is being used to continue the development of the scale.

Appendix 1. The demographic questionnaire used in the study.

Please complete the items with which you feel comfortable.

Sex: Male ☐ Female ☐

Age:

Ethnicity:

Is English your native language? Yes ☐ No ☐

If no, how long have you been speaking English?

Year: Freshman ☐ Sophomore ☐ Jr. ☐ Sr. ☐ Graduate ☐ other ☐

Major(s):

Have you at any time lived in a single parent household? Yes ☐ No ☐

If so, for how long (years/months)?

And from what ages? From the time I was until I was

And with which parent?

Have you ever lived in a nontraditional/non-nuclear family (e.g., with grandparents, foster family, lived with extended family, etc.)? Yes ☐ No ☐

If so, for how long (years/months)? My whole life ☐

If not your whole life, from what ages?

From the time I was until I was

Please use the space provided on this and the following page to describe your family (e.g. foster family, lived with grandparents from age X to age X, etc.)?

Rhetoric, Governmentality, and the Construction of “Illegal” Immigrants in the Post-social State

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Abstract

Jonathan Inda argues that disillusionment with the welfare state by a variety of political forces has led to the development of the post-social state, one that seeks to govern by means of “managing the choices of the citizen.” For Inda, the proliferating discourses on immigration construct “illegal immigrants” as people unable to fulfill the responsibilities of citizenship and as threats to the social body. Grounded in the work of Foucault and other governmentality scholars, this paper examines the current wave of anti-immigrant discourses, locating them within the post-social state as instruments of governmentality. This paper also explores previous examples of anti-immigrant discourses, in particular those surrounding California’s Save Our State initiative, to examine the ways in which the rhetorical shifts of anti-immigration advocates reflect changes in the post-911 exercise of governmentality. An analysis of these discourses demonstrates that the rhetoric used by anti-immigrant advocates portrays illegal immigrants as unethical subjects representing a physical danger to the social body, upholding gendered, racialized, and criminalized representations of immigrants.

Introduction

Immigration has rapidly become the defining domestic policy issue of our current presidential administration. It has done so through its construction as the point of intersection between numerous domestic policy considerations. Social Security reform, the War on Drugs, national security, and national identity are only some of the issues implicated in the recent discussions on immigration policy. The massive immigration protests sparked by the passage of H.R. 4437 (The Border Protection, Antiterrorism, and Illegal Immigration Control Act of 2005) in the House of Representatives serve as just one example of the place immigration issues have taken in the American political consciousness. Not since 1994 when California voters passed Proposition 187 has immigration been so discussed not only among policymakers, but also in popular media, filling the pages of editorials, news broadcasts, and online discussion forums. The proliferation of both governmental and public discourses on immigration opens new opportunities to examine the ways in which rhetoric constructs “illegal” immigration. As Kent Ono and John Sloop argue, immigration rhetoric “*shifts* borders, changing what they mean publicly, influencing public policy...rhetoric at times even determines where, and what the border is.”¹ This rhetorical construction determines not only the physical space of the border but also the way in which “illegal” immigration across the border is represented as a problem. The problematization of the immigrant is constructed by a “variety of experts such as social scientists, politicians, INS/DHS bureaucrats, policy analysts, and the public” who depict ““illegal” immigrants as threats to the well being of the social body.”² The discourses that represent “illegal aliens” in opposition to what Jonathan Inda calls an “ethical

citizenship" are of particular interest to this project. Beginning with an examination of Michel Foucault's work on governmentality and extending this analysis to the development of the post-social state, this work examines the rhetoric of both current and previous anti-immigrant discourses in an effort to expose the role of government rationality in constructing gendered, racialized, and criminalized representations of immigrants.

Michel Foucault and government rationality

In *The History of Sexuality: an Introduction* (1976), Michel Foucault describes what he terms "biopower," which he calls a "power exercised over persons specifically in so far as they are thought of as living beings: a politics concerned with subjects as members of a *population*."³ This relationship between population and the state is one of management exercised not only on the level of large scale interventions against entire populations but also on a localized level where the state attempts to control and manage individuals within a population. This management, expressed as a variety of "techniques of power," is "designed to observe, monitor, shape and control the behavior of individuals."⁴ Exercised in a variety of locations, these techniques of power (or more specifically the description of them) constitute the subject of a significant portion of Foucault's work. While *Discipline and Punish* (1975) and *Madness and Civilization* (1961) can be read as examinations of the local exercise of these techniques of power, Foucault theorized that similar techniques of power governed populations at the level of state sovereignty. This exercise of power, concerned with the management of population of the level of the state (as opposed to local institutions) constitutes a governmental rationality, or in Foucault's words, a "governmentality." In a series of lectures at

the College de France in 1978, Foucault defined governmentality as the ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security.⁵

Colin Gordon takes Foucault's idea to mean that governmentality comes to represent a "system of thinking about the nature of the practice of government...capable of making some form of that activity thinkable and practicable both to its practitioners and to those upon whom it was practiced."⁶

The explosion of discourses dealing with the problems of "illegal" immigration provides an opportunity to examine ways in which these discourses have constructed immigrants as governable. This paper will examine previous scholarship on the correlation between anti-immigrant discourses (and the knowledge they create) and the increased repressiveness in dealing with the problem of "illegal" immigration. Before engaging the issue of immigration, however, it is important to discuss the development of the post-social state and the implications this shift in state function had on the exercise of governmentality.

Governmentality in the post-social state

For Foucault, the exercise of governmentality is not a function of the state, but rather the state is "a function of changes in practices of government."⁷ The state goes through a variety of transformations (liberal, neoliberal, welfare, etc) based on the deployment of government rationality. Prior to the current stage of development, the state could be described as a social state, one

whereby governmentality was exercised to minimize the risks of free-market capitalism through a variety of state interventions aimed at sustaining the welfare of individuals. This social state "conceived of the subject as an individual who was to be governed through society—within a nexus of collective responsibility."⁸ Thus a system of governing individuals was constructed around welfare policies such as access to healthcare, government subsidies, and small protections of rights. Criticism of the welfare state, especially in light of the capitalist restoration in Soviet Russia, the proclamation by British Prime Minister Margaret Thatcher that no alternative to capitalism exists, and Francis Fukuyama's claims of the "end of history," all had the effect of changing the practices of government as described by Foucault. This disillusionment with the social state was followed by a shift away from the practice of government as provider and replaced by decentralized, non-governmental, and market-based actors that took the responsibility of risk management. As Jonathan Inda describes it, the post-social state "seeks to govern not by means of society but through managing the choices of the citizen, constructed now as a being who aspires to be self-actualizing and self-fulfilling."⁹ This self-actualizing conception of citizenship demands that individuals take an active role in managing the vituperative effects of capitalism and withdraws the safety nets provided by the social state. Here again, the nature of the state is changed by the techniques of governing; in this case the post-social state is the result of a market-oriented approach to citizenship where the state's role is no longer "securing the life of the population...through strategies directed and funded by the state, but through the instrumentalization of a desire for self-reliance."¹⁰ This instrumentalization works to manage the choices

of the individual by determining which choices constitute ethical citizenship, defined as the ability to manage risks successfully without the necessity for state intervention. This distinction produced a division between ethical citizens, those who effectively managed their risks, and unethical subjects, imprudent individuals who have failed to manage the risks endemic to the free-market economic policies characteristic of the post-social state.¹¹ Yet as Foucault warns us, “discipline was never more important or more valorized than at the moment when it became important to manage a population” and the management of choice by the post-social state is no exception.¹² The post-social state disciplines its charges through a variety of citizenship technologies that aim both to activate ethical citizenship in unethical bodies and restrict those seen as incapable of exercising responsible risk management. The intervention against unethical bodies becomes necessary not simply as punishment for failing to participate in ethical citizenship but also as preventatives against their interference with the exercise of ethical citizenship by others. This intervention is imperative to the functioning of the post-social state, constituting “a growing dependence of crime and punishment” in which “the post-social police state flourishes as a penal dragnet comes to blanket and demarcate racialized zones of exclusion.”¹³

The construction of “illegal” immigrants as threats to the well-being of the population represents the exercise of citizenship-restricting technologies on the part of the post-social state. Discourses that work to problematize “illegal” immigrants—as economic, cultural or physical harms to the social body—render immigrants governable, vulnerable to a variety of repressive interventions in the name of defending the ethical citizenry. Examining the specific

discourses that work to construct immigrants as an anathema to the social body demonstrates how these discourses represent the exercise of a governmentality by which the post-social state seeks to govern unethical bodies through their exclusion. This exclusion is constructed through racialized, criminalized and gendered representations of "illegal" immigrants.

The gendered construction of "illegal" immigrants

The exercise of governmentality as it attempts to manage particular subjects (in this case unethical "illegal" immigrants who threaten the social body) is often deployed along gendered lines. Among the constructed discourses employed by the state in problematizing "illegal" immigration are those that deal with the "hyper-fertility" of immigrant women. For instance, a discourse that focuses on immigrants as a drain on public services reproduces "the historical racist, sexist construction of Mexicanas and Chicanas as 'breeders'" (Ono and Sloop 39). This gendered conception of immigrant bodies as predisposed to higher fertility is often reproduced in public discourses when the purpose is to marginalize immigrant populations. The image of immigrant women as "breeders" was highly prevalent in the discussions preceding the passage of California's Proposition 187. An editorial in *The Sacramento Bee* linked fertility rates with problems in California's healthcare system, claiming that "to provide prenatal and obstetrical care to illegal aliens through the Medi-Cal system alone is a staggering figure given their high fertility rate."¹⁴ This passage also illustrates how the gendered construction of immigrant women interacts with the construction of immigrants as unethical subjects. High fertility rates necessitate excessive

government aid (Medi-Cal), not only constituting a drain on the resources of the state, but also undermining the access of those resources to ethical citizens. A *Washington Post* article written in the aftermath of Proposition 187 describes how legislators around the country worked to construct their own versions of California's ballot initiative. The article quotes a Virginia lawmaker stating that "[i]f the statistics show this is a growing problem and we, in fact, have become a breeding ground for illegal immigrants, then I think we have to take some steps."¹⁵ The presence of immigrant "breeders" becomes a justification for the exclusion of immigrant bodies manifested in repressive legislation that strips immigrants of basic rights now reserved for those who exercise ethical citizenship. While these examples represent public discourses that reproduce gendered representations of immigrants, at times this rhetorical construction is advanced by highly respected policy makers and prescribers. This is evidenced in Samuel Huntington's claim in *Foreign Policy* that the "most immediate and most serious challenge to America's traditional identity comes from the immense and continuing immigration from Latin America, especially from Mexico, and the fertility rates of these immigrants compared to black and white American natives."¹⁶ That such an explicitly gendered construct was published in a major policy journal and written by a former coordinator for security planning for the National Security Council lends credence to Foucault's conception of governmentality as a system of knowledges of populations which renders them governable. Huntington's representation of immigrants' fertility as disproportionate to a constructed normality of "native" fertility rates is precisely the same gendered construction of immigrants as "breeders" which rendered Mexican women governable through

forced sterilization in the 1970s. While the view of immigrant women as "breeders" is certainly pervasive in the systems of knowledge pertaining to "illegal" immigration, those systems also present other gendered constructions of immigrants.

Another example of a gendered construction of immigrants, heightened in the aftermath of the avian flu pandemic hysteria that overwhelmed the American imagination in the first few years of the twenty-first century, was the idea of the immigrant as diseased. Sue Hokana's editorial in *The Sacramento Bee* claimed that the arrival of immigrants brought "diseases once thought to be relatively rare or under control in the United States, such as leprosy, Chagas' disease, hepatitis A, rubella and tuberculosis."¹⁷ The view of immigrants as health threats tends to focus on immigrant women, "constructed as bodies carrying disease, as potential polluters of the citizen body, and as carriers of infection."¹⁸ The Federation for American Immigration Reform's (FAIR) website takes the issue of disease further, reporting that "the problem, however, is not confined to the border region, as illegal immigrants have rapidly spread across the country into many new economic sectors such as food processing, construction, and hospitality services."¹⁹ The spread of disease is constructed as gendered both by the rhetoric of immigrants as "carriers" (an archetypical female role) and by process of disease spread itself, often imagined in relation to the feminine domain of domesticity, or as FAIR puts it, food processing, and hospitality services. The comments from FAIR represent a governmental discourse, constructing knowledges about "illegal" immigrants from the position of policy analysts and political lobbyists. These constructions make thinkable appropriate responses in the name of preserving the well-being of the social body, in this case a gendered

exclusion of immigrants and an increased repressiveness against them to prevent immigrants from “infecting” the body politic. Under such a construction, any level of intervention, even the management of life, becomes justified to ensure the security of the population.

The illegality of illegal immigration

The contemporary immigration debate has focused significantly on questions of citizenship, specifically whether “illegal” immigrants can be considered eligible for citizenship. This distinction between legal and “illegal” immigrants “casts immigration in moral terms: those who abide by U.S. laws and procedures...are cast as good and moral citizens, those who do anything but...are seen as bad and immoral ‘illegals.’”²⁰ The criminalization of immigrants also functions as an exercise of governmentality; the discursive construction of “illegal” immigrants serves to render their exclusion not only thinkable, but necessary. As Jonathan Inda has argued, the criminalization of immigrants justifies intervention to protect the well-being of responsible citizens: “the containment of the few therefore becomes a prerequisite for the freedoms of the many.”²¹ One way in which the criminality of “illegal” immigrants is constructed is through discourses which depict immigrants as cutting in line in front of those who seek to enter the country legally. A 1997 article in *The Washington Post* exemplifies this discursive construction. First, the author presents a normalized description of the “legalization” process whereby “the government lets about 386,000 foreigners legalize [*sic.*] each year, and all must wait their turn.” The article contrasts legalized immigrants, those who abide by government regulations, with “illegal” immigrants

who "cut ahead of those who have waited abroad for years to immigrate legally."²² Such discourses are extended to depict "illegal" immigrants as unethical subjects with little consideration for the rule of law. The willingness of "illegal" immigrants to break the immigration laws of the U.S. is understood as a willingness of immigrants to break all laws.

Matthew Nelson's letter to the editor in *The Sacramento Bee* is exemplary of this tactic of governmentality meant to criminalize the unethical immigrant. In the letter, Nelson argued that the *Bee*'s use of the adjective "undocumented" was misleading, noting that "[s]ix times the article used the word 'immigrant' or 'immigrants' without the proper preface 'illegal.'" For Nelson, that usage was problematic because "they are lawbreakers.... They do have criminal records, like it or not: They are accused of breaking federal immigration laws."²³ The construction of "illegal" immigrants as lawbreakers, rather than simply those who have broken a law, allows the immigrant to be seen as in continuous violation of ethical citizenship. It is not just the act of having crossed the border "illegally" that frames immigrants as lawbreakers; their very existence represents a daily defiance of American immigration laws making them ineligible for participation in ethical citizenship. A petition circulated by Americans United Against Illegal Immigration demonstrates how criminalized representations of immigrants, that is to say an exercise of governmentality of immigrant populations, can move beyond public discourse and into the realm of politics proper. The petition described the propensity for criminal behavior on the part of immigrants who "do not respect our laws, whether they are the immigration laws, employment laws, tax codes or criminal laws."²⁴ Such claims of knowledge over the criminality

of “illegal” immigrants come dangerously close the logical fallacy of *post hoc ergo propter hoc*, whereby violation of immigration laws implies a readiness to violate others. Constructed as unethical subjects whose mere presence represents a risk to ethical citizens, “illegal” immigrants are deemed governable only through a variety of exclusions, such as confinement or deportation.

A more specific criminalization of immigrants was constructed in the rhetoric of California’s Proposition 187, the so-called Save Our State initiative passed by California voters in 1994. The proposition had numerous provisions, among which was that “illegal” immigrants would be denied access to emergency health care and education. Arguments made against the proposition (and against denying public services to “illegal” immigrants) not only reproduced gendered conceptions of immigrants based on the paternalist assumptions that immigrant groups required state intervention (because of their inability to manage their risks effectively), but also created parallel criminalized representations of immigrants as well. Specifically, the arguments created a link between a lack of education and crime, noting that the passage of Proposition 187 would turn immigrants (and their children) towards a life of crime and delinquency. The assumption was that “criminal behaviors by undocumented immigrants are inevitable...that save for education, undocumented immigrants are by nature delinquents.”²⁵ The construction of a relationship between immigration and criminality, whether as the product of the immigrants’ own illegality by breaking immigration law or as the inevitable result of their disposition that can be curtailed through state sanctioned education demonstrates how both the pro and con sides of the immigration debate surrounding Proposition 187

worked as exercises of governmentality. Both arguments claimed to hold knowledge of immigrants, in this case knowledge of their criminality, and in doing so, render them governable, manageable, and ultimately excludable.

The racialization of the alien

Samuel Huntington's assumption that "Hispanic" women have higher fertility rates than "native" white Americans is a perfect example of how anti-immigrant discourses construct immigrants in a number of problematic ways. Not only are immigrants gendered through a focus on the fertility rates of women (*i.e.*, the "breeder"), but such rhetoric also constructs biological differences between immigrants (primarily imagined as Hispanic, or more specifically, Mexican) and native born (read white) Americans. Similarly, the criminalization of "illegals" is constructed along racial lines. As Ono and Sloop explain, "the biologist [*sic.*] racialization of Mexicanas and Mexicanos and Chicanos and Chicanas in this discourse focus on them as more prone to criminality and violence and more in need of "proper" public education than other groups."²⁶ Here again popular discourse comes dangerously close to reproducing the biological determinism that depicted blacks (and other ethnic groups) as inferior, rendering them governable only by repressive and exclusionary means. Another racialized discursive construction commonly reproduced in anti-immigrant rhetoric is the depiction of the scale of "illegal" immigration. Huntington achieved this depiction of scale with his enumeration of Mexican immigration to the U.S. Relying heavily on statistics to support his argument against immigration, he noted that "by 2000, Hispanics totaled about half of all migrants entering the continental United

States. Hispanics composed 12 percent of the total population in 2000. This group increased by almost 10 percent from 2000 to 2002.”²⁷ For Inda, these “enumerative practices” lead to “the creation and consolidation of a general image of ‘illegal’ immigrants as invasive and out of control.”²⁸ Once determined to present a danger to the well-being of the social body, these invasive “aliens” are deemed removable and excluded. This problematization has “located them in a realm of abjection where they could be subjected to all kinds of punitive measures in the name of protecting the welfare of the population.”²⁹ More often than not, these punitive measures take the form of virulently anti-immigrant legislation like Proposition 187 or more recently, Congressional legislation that attempts to strengthen the ongoing processes of racialization through a militaristic expansion of border security measures, further entrenching the “alien” representation of immigrants.

Conclusion

Anti-immigrant discourses which problematize immigrants along lines of race, gender, or criminality demonstrate the exercise of governmentality in that they seek to create knowledge of the immigrant that render the population governable only in negative ways. In the context of the post-social state, governmentality in its repression and exclusion of a governable population for the sake of the well-being of the social body comes to represent the state’s exercise of biopower. The consequences of that power, however, often has had dire consequences. Foucault observed that “it is as managers of life and survival, of bodies and race, that so many regimes have been able to wage so many wars.” That destructive managerial power is constructed through the exercise of governmentality.³⁰ The

rhetorical construction of "illegal" immigrants as threats to the well-being of ethical citizens represents an exercise of governmentality that makes the exclusion of immigrants seem not only possible, but necessary for the security of the social body.

This analysis is not intended to present a pessimistic view of the future direction of immigration policy. As Inda tells us, such an analysis of power relations can bring to light the connectedness between "thinking and acting, representing and intervening, knowing and doing," and expose the "modern operations of power/knowledge."³¹ This analysis could thus serve for further investigations into the relationship between immigrant discourses and the exercise of governmentality. Such an analysis is also necessary to understand how "biopolitics thus provides a prime instance for what Foucault calls the "strategic reversibility" of power relations, or the ways in which the terms of governmental practice can be turned around into focuses of resistance."³² Such a strategic reversibility seems more pressing in light of the recent proliferation of anti-immigrant rhetoric and adds a sense of urgency to further investigations into the relation between governmentality and the construction of "illegal" immigrants.

Notes

- ¹ Kent Ono and John Sloop, *Shifting Borders: Rhetoric Immigration and California's Proposition 187*. (Philadelphia: Temple University Press, 2002), p. 5.
- ² Jonathan Inda, *Targeting Immigrants: Government, Technology, and Ethics* (Oxford: Blackwell Publishing, 2006), p. 3.
- ³ Colin Gordon, "Government Rationality: An Introduction" in *The Foucault Effect: Studies in Governmentality*, ed. Graham Burchell, Colin Gordon, and Peter Miller (Chicago: University of Chicago Press 1991), p. 5.
- ⁴ *Ibid.*, p. 3.
- ⁵ Michel Foucault, "Governmentality" in Burchell, Gordon, and Miller, *The Foucault Effect*, p. 102.
- ⁶ Gordon, "Government Rationality," in Burchell, Gordon, and Miller, *The Foucault Effect*, p. 3.
- ⁷ Gordon, "Government Rationality," in Burchell, Gordon, and Miller, *The Foucault Effect*, p. 4.
- ⁸ Inda, *Targeting Immigrants*, p. 11.
- ⁹ Inda, *Targeting Immigrants*, p. 13.
- ¹⁰ Inda, *Targeting Immigrants*, p. 17.
- ¹¹ Inda, *Targeting Immigrants*, pp. 18.
- ¹² Foucault, "Governmentality" in Burchell, Gordon, and Miller, *The Foucault Effect*, p. 102.
- ¹³ Inda, *Targeting Immigrants*, p. 21.

- ¹⁴ Sue Hokana, Editorials, *Sacramento Bee*, November 16, 2003.
- ¹⁵ Spencer S. Hsu, "Va. Lawmaker Takes Aim at Illegal Immigrants; Senator From Fairfax Rekindles Debate in State, Seeks California-Style Crackdown", *The Washington Post*, January 16, 1995.
- ¹⁶ Samuel Huntington, "The Hispanic Challenge" *Foreign Policy*, March/April, 2004.
- ¹⁷ Hokana, Editorials, *Sacramento Bee*, November 16, 2003.
- ¹⁸ Kent and Sloop, *Shifting Borders* p. 39.
- ¹⁹ "Illegal Immigration and Public Health.", *Federation for American Immigration Reform*, last accessed September 5, 2006 <http://www.fairus.org/site/PageServer?pagename=iic_immigrationissuecenters64bf>.
- ²⁰ Ono, Kent, and Sloop, *Shifting Borders*, p. 26.
- ²¹ Inda, *Targeting Immigrants*, p. 53.
- ²² Constable, Pamela, "Caught Between Home, Homeland; Immigrants in Legal Limbo May Be Forced TO Leave" *The Washington Post*, September 18, 1997.
- ²³ Nelson, Matthew, Editorials, *Sacramento Bee*, December 26, 2004.
- ²⁴ Robert McKinney, "To: President George W. Bush, U.S. Congress, & U.S. Senate." *Petition Online*. Americans United Against Illegal Immigration, 5 Sep 2006 <<http://www.petitiononline.com/4America/petition.html>>.
- ²⁵ Ono, Kent, and Sloop, *Shifting Borders*, p. 33.
- ²⁶ Ono and Sloop, *Shifting Borders*, p. 34.

²⁷ Huntington, "The Hispanic Challenge" *Foreign Policy*, March/April, 2004.

²⁸ Inda, *Targeting Immigrants*, p. 89.

²⁹ Inda, *Targeting Immigrants*, p. 112.

³⁰ Michel Foucault, *The History of Sexuality: An Introduction*, (New York: Vintage Books, 1978) p. 136.

³¹ Inda, *Targeting Immigrants*, p. 9.

³² Gordon, "Government Rationality," in Burchell, Gordon, and Miller, *The Foucault Effect*, p. 5.

Children's Use of Intentionality Cues in Verb Learning

by Joshua Tabaldo
Psychology

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Abstract

Attempts to discern how children solve the problem of learning language have tended to focus on nouns, but few studies (Carpenter, Akhtar, & Tomasello, 1998) discuss the acquisition of verbs. While noun learning can be attributed largely to the whole-object and the mutual exclusivity assumptions (Markman, 1985), a possible tool for verb acquisition uses intentionality cues, for which one assumes that novel verbs refer to intentional actions. To test this hypothesis, we presented children aged 22-26 months with a dual display of paired action videos, one representing an accidental action and the other representing an intentional action. The action streams in each pair of videos were identical; they differed only in the object being manipulated and contextual information that distinguished which action was categorized as intentional and which accidental. By asking children to choose the video that portrays the novel verb, we can interpret the child's use of intentional cues. Children pointing to the intentional video would support our hypothesis; children pointing to the accidental videos would dispute it.

Introduction

For decades, psychologists and linguists have been trying to solve one of the premier riddles of childhood development: how do children learn language, or more specifically, how do children acquire novel labels? Quine (1960) developed the “Gavagai” example to illustrate this phenomenon. Imagine a young anthropologist exploring a new land with the help of a native guide. Exposed to this novel native language, the anthropologist has a hard time deciphering what his guide is saying. While the two wander down a dirt path, a rabbit darts in front of them. The guide points at the animal and exclaims, “Gavagai!” To what is the guide referring? Perhaps he is saying, “There it goes!” or even referring to his pet rabbit named “Gavagai.” He could be pointing out that the animal is white, fast, or has big ears. Perhaps these natives hold the rabbit as a sacred religious symbol that is viewed as the center of their universe. The point is that there are an infinite number of possible referents for the word. How can the anthropologist correctly determine the guide’s meaning? Quine defines this as the problem of induction. The task, however, is much more difficult for a language-learning infant than for our anthropologist. While the anthropologist has higher-level cognitive abilities and prior language experience, the infant has neither, which only amplifies the problem. Of course, children find ways to master language at a rapid rate and have access to a range of tools to help them achieve that mastery.

Ellen Markman (1989) proposed a few basic assumptions about mental tools that children have when making judgments about novel linguistic data. First, the *whole object assumption* asserts that when presented with a novel label for an object, a child will

assume that the label refers to the object as a whole. For example, when the guide pointed and said, "Gavagai!" one of the child's first inclinations would be to map that label to the entire rabbit, not just the ears or the manner in which it jumps. Second, the *taxonomic assumption* posits a cognitive constraint suggesting that children assume a word refers to a class of individuals rather than to a single animal or person. Going back to our Gavagai example, this bias shows that we attach the label not to specific rabbits, but to rabbits in general. Markman's third assumption is that of *mutual exclusivity*, which states that children will not assign a new label to an object that already has one. When a novel label is presented to refer to a previously labeled object, the new label could refer either to part of the object or to an adjacent object. For example, if one were to present a 3-year-old with two objects, one familiar (a banana) and one novel (a lemon wedge press) and present the child with a novel label, the child would assign the word to the object that does not yet have a label (Markman & Wachtel, 1988).

The three assumptions also can work in conjunction with one another. Perhaps we already know that "Gavagai" refers to the entire rabbit, because of the whole object assumption, but we are given a new label. Using mutual exclusivity, we assign the word to refer to part of the rabbit, such as the floppy ears. These assumptions are great for understanding how children learn labels for static, tangible objects. Little is known, however, about how children successfully solve the problem of induction when learning novel verbs. The action verbs that children first learn refer to something that usually occurs momentarily. Although Markman's theory of assumptions has been investigated only with regard to children's acquisition of nouns, it is possible that children similarly have assumptions

about the referents of novel verbs, an idea that is the core of this research.

When trying to understand how children acquire verbs, it is important to know what else they are capable of doing because one skill might aid in the formation and mastery of another. Children have an extraordinary ability to understand a person's goals and intentions (Meltzoff, 1995; Sommerville & Woodward, 2005; Woodward, 1998). That ability, as a study by Carpenter, Akhtar, and Tomasello (1998) has shown, is apparent in children as young as 14 months of age. That study also showed just how action and intention are connected. In the study, 14- to 18-month-olds watched an experimenter interact with an apparatus with two features that could be manipulated. The experimenter would engage both items on the apparatus, but the action was designed so that either manipulation could be deemed intentional or accidental. The only evidence the children had to infer intention was the experimenter saying either "Woops!" or "There!"—making only one of the words refer to one of the manipulations and the other word refer to the remaining action. Of course, the different scenarios were counterbalanced. Saying "Woops!" was supposed to connote an accident, and saying "There!" meant an intentional action. After the ambiguous action engaged both items on the apparatus and the two terms were verbalized, children were asked to make the apparatus work. Children preferred to imitate only the action that was identified with the label "There!" suggesting they prefer to imitate intentional actions. They might have known that the accidental manipulation of one of the items (marked by the "Woops!") would not activate the apparatus, and thus, did not attempt to recreate that action. This suggests that infants have some

knowledge of dealing with action in terms of an actor's intentions and goals. Infants appear to show the ability to use language to help classify action as either intentional or accidental. Therefore, the data suggest that children might be able to use verbs, a piece of language that strictly refers to action, to make similar judgments.

A different study by Tomasello and Barton (1994) connected intentions and action with the addition of verbs to display children's use of intention in verb acquisition. In their study, Tomasello and Barton presented 2-year-old children with two novel verbs (either "twang" or "hoist"), with each verb being associated with a toy. Two structures were used for this experiment, a crane and a merry-go-round, with each structure being capable of both actions (twang or hoist). In the intentional-first condition, the experimenter said, "Let's (either twang or hoist) Big Bird. Let's (either twang or hoist) him." They performed the target action and then the accidental action in the same general action sequence. The only information the children had in order to base judgments of intentionality was the experimenter saying, "There!" right after producing the target action and either "Woops!" or "Uh-oh!" directly after the accident. As one kind of control, the researchers simply had the accident precede the target action. The assignment of the target words (either plunk or whirl), the order of conditions, and the order of the toys (either Big Bird or Ernie) were counterbalanced across all conditions. Two comprehension tests had the child reproduce the two target actions in the different tests, one in each test. Only the child's first response was recorded. The results show that no child in any condition reproduced the accidental action but would equally reproduce the intentional action whether it came first or last. This study shows that the two-year-olds could rely on the

social-pragmatic information about the experimenter's intentional state to learn new verbs.

These two studies suggest that children assume that novel verbs refer to intentional actions. The Carpenter et al. study (1998) suggests that infants readily construe action in intentional terms, and this information is important in their own engagement with the world. The Tomasello and Barton (1994) study suggests that infants prefer to map verbs onto intentional actions. It is unclear, however, from the Tomasello and Barton (1994) article whether infants assumed that novel verbs refer to intentional acts, or whether intentional acts appear more salient, and children simply attached the verb to the salient action. By replicating this research with a new methodology, we can hope to gain a better understanding of whether and how children use intentionality cues in verb learning. If replication of the research asserts this claim, further questions can probe the basis of the intentional bias. Would it be harder to learn accidental verbs? If so, then we could test this by perhaps teaching children novel verbs for new actions (some intentional and some accidental) and then do a vocabulary test on those words later. Another question could explore whether children have a means to resist mapping novel verbs to accidents? If so, we could devise ways of finding these means of resistance. These are some of the questions we intend to investigate once preliminary research is conducted. And all of these questions further the fundamental query of how children acquire language, but more specifically, verbs.

Thus, the current research is part one of a two-part study. This first part is intended to replicate the previous Tomasello and Barton (1994) study with a new methodology. The next part of the study

will explore the nature of this difference (if one is found) and whether there is a resistance towards mapping novel verbs onto accidental actions.

Method

Participants

Eight children were the participants for the study. The age of the participants ranged from 23 months and 29 days to 25 months and 26 days ($M = 24$ months and 23 days, $SD = 22$ days). Five children were female and three were male. Three participants were not included in data analysis because they did not point to any of the trials (2) or equipment failure (1). The participants were recruited by the telephone, using information from birth announcements in a local newspaper. The children (and adults) were compensated for their cooperation and time with either a small T-shirt or a gift certificate to a local toy store.

Apparatus

The child was placed in front of two separate television sets with a DVD player embedded in each television. The TVs were separated by about a foot on two identical wooden stools. The experimenter used a remote control for the television sets to control the starting of the next trials during the experiment. Each child sat in a small chair so that the viewing level was the same as the level of the television sets, but right in front of a parent, who sat in another chair. The participant sat about 2 feet in front of and directly between the two televisions. The experimenter sat on the floor between the two televisions in order to (1) control the starting and stopping of the videos and (2) engage the child for responses. Two video cameras recorded each session. One camera, placed

behind the televisions, recorded the responses of the children; the second camera, placed in the back corner of the room, recorded the stimuli on the televisions. A curtain hanging behind the televisions occluded everything, but had a circular opening for the camera lens (See Figure 1, 2 and, 3).

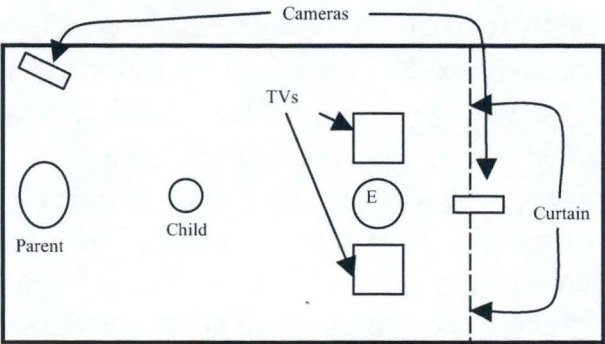


Figure 1: Diagram of experimental setup.



Figure 2: Experimental setup showing the back of the room.

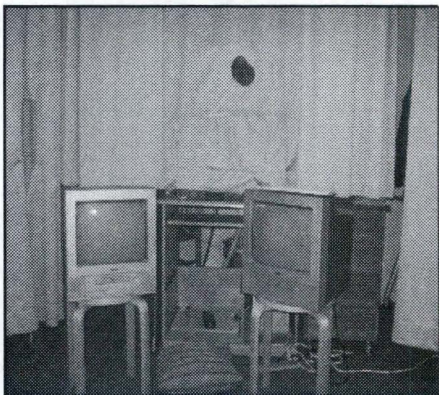


Figure 3: Experimental set up showing the front of the room.

Procedure

Participants came to our laboratory for a single half-hour visit. The current study included four different trials (each a different action). When the child participants entered the room with their guardians, we let them become acquainted with the room and the experimenter while the guardians provided informed consent. Once each child was ready to begin, the experimenter gave the guardian the MacArthur-Bates Communicative Development Inventory [CDI], a parental checklist of vocabulary used and/or known by the child, along with a supplemental vocabulary sheet to fill out during the remainder of the experiment. Meanwhile, the child sat in front of the monitors after the experimenter asked: "Would you like to watch some movies?"

Warm-up trial

In order to get the children used to pointing to the televisions, once the child sat down, the experimenter simultaneously placed two small figures, one a cat and the other a dog of similar size and color, on top of each of the televisions. The experimenter then asked the child to point to the television with the dog on top of it. Once the child produces the correct response, the experimenter asked the child to point to the television with the cat on top of it. If no responses are made, the question can be repeated and perhaps rephrased to elicit a response from the child.

Study

Once the child correctly pointed to the televisions in the warm-up trial, the experimenter took the small animal figures down and then started one of the DVDs. Each video started with a black screen. The experimenter would say, "Watch, she's going to blick it! She's going to blick it!" and then push play on one television

(counterbalanced either left or right). A short action video would then begin that depicted a woman performing an action such as clinking a teacup or ripping a sheet of paper. Starting in a neutral state, the video would zoom in on the action being completed so that the actress' face could not be seen. After the action was completed, she would say an utterance to assign intentionality. The actress would say either "Oops," "Okay," "Uh-oh," or "There" for the *clink*, *break*, *dump*, and *rip* videos with "Oops" and "Uh-oh" being accidental utterances and "Okay" and "There" representing more intentional sayings. The video looped three times with a second of a black screen between each loop before ending on a still frame of the end state of the action. Then, while the still frame was showing, the experimenter pressed play on the other DVD player to start its video of the same action, but the video was different in two ways. First, the object being manipulated to complete the action was different from the object depicted in the first video. Second, while the utterance of the actress was either the intentional or accidental saying in each video, the exact utterance was different from the one used in the first video loop, (See Table 1.) After playing the second

Table 1-Different versions of actions

Action	With object 1	With object 2
Dump	Legos in bucket	Fish crackers in fish container
Rip	Magazine	Fabric
Clink	A bottle and glass	Cereal bowl and spoon
Break	Salamander toy	Lego tower

video three times before freezing on its end state, the experimenter asked the child, "In one of these, she's blicking. Can you point to

Table 2-Number of Points by Order and Intentional Placement

		Order of Point		Total
		First	Second	
Intentional	First	4	10	14
Placement	Second	2	12	14
Total		6	22	

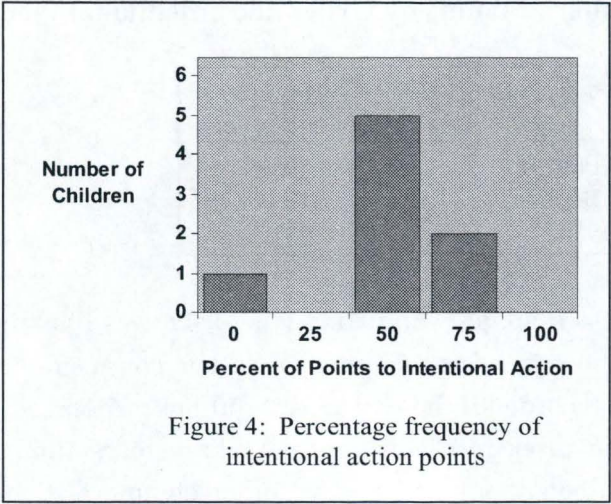
where she was blinking? Show me where she was blinking.” The participant’s points were recorded as either correct or incorrect; nothing was recorded if the participant did not respond.

The same procedure was repeated three more times for the remaining three actions. Of course, other obvious variables such as the order of the intentional sound, which video was played on the right or left, and what was said by the actress are all counterbalanced.

Results

Analysis of the data explored various aspects of the study, but did not include analysis by action or by verb pair (oops/okay or there/uh oh) because the study was not fully counterbalanced. To do a full analysis by action, the entire counterbalancing scheme would be needed.

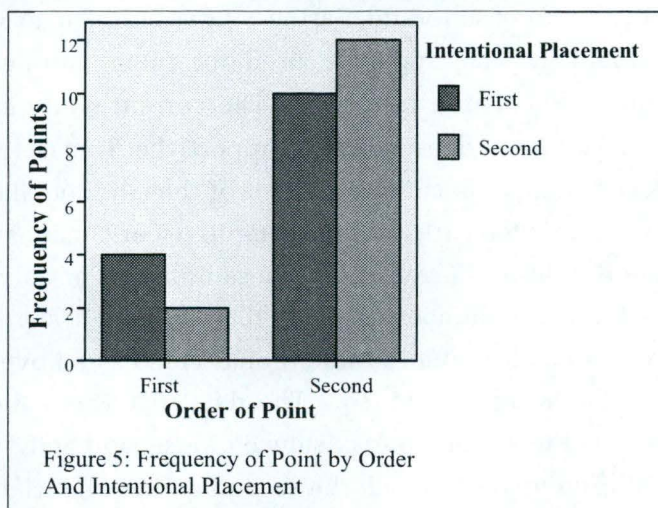
A between-subjects, one-sample t-test analysis of the percentage of correct points ($M = 50\%$, $SD = 23.15$) shows that there was not a significant number of points to the intentional video. The data thus far show that children are pointing to the intentional video at a level expected by chance (50%), $t(7) = 0.00$, *ns*. This result, however, does not accurately describe the nature of the data because one subject with a score of 0% correct (two non-responses and two incorrect responses) drove down the sample mean. In Figure 4, we



see that the majority of children pointed to the intentional action at about chance levels or slightly above. At this point in the study, the participant who had 0% correct points is being included in the dataset because the counterbalancing scheme is not yet complete. Once the entire data has been collected, the participant's inclusion in the data can be further decided.

A prediction interaction looked into order of point and intentional placement. It was found that whether participants pointed to the first or second action did not differ on the intentional placement of the action (whether the intentional video came first or second), $\chi^2(1) = 0.848$, $p > 0.3$ (See Figure 5). Taking a closer look at Figure 5, we see the beginning of an interaction occurring, though nothing close to significance. We would expect to see a lot of points to the first action when the intentional video is first and a lot of points to the second action when the intentional video is second. Unfortunately, children tended to point to the second

action regardless of whether it was intentional. The participants, however, had a slight preference to point to the first action when the



intentional video was shown first. That slight preference provided a hint that our research may be on the right track, especially when we examine the planned binomials of marginal frequency, which showed that children had a bias to point to the second action regardless of other factors ($p < 0.005$). The results revealed no side bias; that is, no preference to point at one side over another.

Discussion

This experiment examined one of the key problems in language development: how do children acquire language when there are an infinite number of possible referents for each object (Quine, 1960)? More specifically, the study focused on the under-researched enigma of the acquisition of verbs and how children's knowledge about intentions varies their learning judgments. Based on research

by Carpenter, Akhtar, and Tomasello (1998) and also in Tomasello and Barton (1994), the study meant not only to replicate the principles in the Tomasello and Barton study, but also to utilize a new methodology that might be used for future studies and to look at the problem in a new way. The current study and its methodology, however, does not yet support the Tomasello and Barton (1994) findings. Because only half of the counterbalancing order was filled, it is too early to draw definitive conclusions about the verb-intention bias. Currently, with a sample size of only eight participants (half the number needed) there is not a significant number of children choosing the intentional video as a novel verb referent over the accidental video. The data that was collected, however, seemed to suggest the existence of a second action bias, by which children tended to pick the second action of a trial more frequently than the first action. With more participants, results may begin to improve.

Even once the counterbalancing scheme is filled, there are a few limitations to this study that merit further exploration. One possible way to improve the methodology of the current study would be to use live actors instead of videotaped actions. That change might make the actions more naturalistic and more salient to the children.

Perhaps a better way to structure the study would be to include a control trial of some sort to identify and possibly eliminate any confounding variables. One way to do this would be to ask the children to point to the video without giving them any novel verbs. Basically, we would ask the children to point to the video that they like most. Another possible control would omit any verbal contextual information ("oops," "there," etc.) during the videos, but

still ask the children to point while giving them the novel verbs.

Another possible improvement would be to include more participants of an older age group. Although the Tomasello and Barton (1994) study had an age range similar to the current study, the subjects had a different task. Therefore, the experiment might be worth trying with an older child population to see if there is an intentional bias in verb learning. It is possible that for some children the task was too simple and boring. In that case, children may have chosen not to respond or not to pay enough attention to point correctly. Either way, a developmental trend might occur so that some ages would excel in the task while other ages would not.

The current study is basically one of replication with the added goal of exploring whether the intentional bias, if present is related to a resistance toward an accidental interpretation over the intentional action. Further, what passes for an intentional bias may be due just as well to a higher salience or more acceptance for an intentional interpretation. This intentional bias may, with more investigation, be shown to be a type of assumption used in verb acquisition, similar to the Markman (1989) assumptions in noun learning. This research may open up further venues for other possible assumptions in word learning, dealing with intentions, emotional states, and motion streams. Perhaps, like the interaction that occurs between different noun assumptions, verbs also have assumptions that work with one another to assist children in their journey toward language acquisition. Taking that idea another step, it would also be economical to have the different assumptions for nouns and verbs work in conjunction with one another to aid in the acquisition of other words.

With the completion of this study, researchers come a step

closer to a full understanding of how children find the correct label when each thing has an infinite number of possible referents; or how children solve the problem of induction. Although we offer no solution at present, we hope to have more evidence of children utilizing intentionality cues for their language and cognitive development once the entire counterbalancing scheme is complete. For the time being, there is a slight second-action bias with no significant preference to point to an intentional video over an accidental one. Knowing that there is a preference towards a more intentional mapping of verb referents will lead to more research possibilities while exploring the foundations and extent of this apparent bias in children's preferences. Looking at how this possible verb learning assumption emerges and interacts with other biases will be a worthwhile endeavor.

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Other Research by McNair Scholars at the University of Oregon

Abstracts

Propositional Modality and Cognition: An Exploration into the Role of Force Dynamics in Epistemic Reasoning

Lucia Black, Romance Languages / Linguistics

Faculty Mentor: Eric Pederson, Linguistics

The idea that force dynamics is cognitively operative in the deontic domain is generally accepted. This paper examines the role of force dynamics and the metaphor of force in linking the deontic and epistemic domains in English. It provides a selective overview of the theoretical claims about propositional modality and force dynamics, and of the diachronic and language acquisition research linking polysemous forms (deontic and epistemic modal auxiliaries). The experiment designed for this paper aims to strengthen the claim that force dynamics is operative in epistemic reasoning as well. Participants were given tasks involving varying degrees of inferential pressure and given a choice of auxiliaries of varying degrees of epistemicity. Generally, high inference tasks correlated with participants choosing an epistemic modal of high certainty, and low inference tasks correlated with the choice of epistemic modal of lower certainty. Limitations of note include the small sample size and the inclusion of negation and some less-used auxiliaries as choices. Participants' varying understanding of the task and varying levels of self-confidence also was brought to bear in their subjective choice of modal auxiliary.

Effect of Literacy on Success in a Court-Sponsored Drug and Alcohol Treatment Diversion Program

Roseanna Boyer, Psychology / PPPM

Faculty Mentor: Robert Mauro, Psychology

Faculty Mentor: Michael Hibbard, PPPM

Lack of basic literary and life skills has been implicated in the failure of individuals to complete drug and alcohol treatment programs, increasing the rate of recidivism following completion of the programs. Individuals with low levels of literary and life skills have difficulties holding jobs and maintaining personal relationships. In this project, we will assess basic literary and life skills using the Comprehensive Adult Student Assessment System (CASAS) and relate performance on this measure to measures of success and recidivism in the Lane County Drug Court treatment programs. If individuals with higher levels of literacy or life skills demonstrate higher success rates and lower recidivism rates, then the study would provide justification for developing interventions designed to increase levels of literacy and life skills in individuals referred to the Drug Court. This project is the result of collaboration between the Lane County Circuit Court, Emergence Treatment Services, Lane Community College, and the University of Oregon.

Coping with Hunger: Experiences of Food Insecure Latinos in Eugene, Oregon

Maria Cortez, Geography / Environmental Studies

Faculty Mentor: Lise Nelson, Geography

Eugene, Oregon, hosts a Latino community greatly affected by food insecurity. Almost half of all Latino adults in Oregon lived in food insecure households in 2002; a problem that is generally unrecognized by the local community. Food insecure Latinos living in the Eugene area struggle to cope with such conditions through a number of mechanisms including reliance on food stamps, food boxes, and help from family. When those resources are exhausted, they are left with few alternatives. This project examines the state of food insecurity and coping strategies among Latinos in Eugene while also exploring the role that social service agencies have in providing assistance to this community.

Agent Orange and Reparations for Viet People

Khanh Le, Ethnic Studies / Political Science

Faculty Mentor: Lynn Fujiwara, Women's and Gender Studies

The United States used Agent Orange, a toxic chemical, during the U.S. war in Viet Nam to kill vegetation that protected "enemies." Thirty years later, over four million Viet nationals continue to encounter the effects of the war as they contract grave illnesses from the deadly toxin. This chemical is banned in the U.S. because the government recognized it as harmful to people. A class action lawsuit forced companies that produced Agent Orange to compensate U.S., Canadian, New Zealand, and Australian veterans exposed to the chemical. Viet nationals are dying from similar health complications, but are unable to benefit from similar compensation. An analysis of the Agent Orange controversy and a comparison of the successful lawsuit by U.S. veterans with the unsuccessful lawsuit filed by Viet nationals reveals the lingering effects of both a racist construction of "enemy" and the Viet Nam syndrome.

Hexabenzocoronene (HBC) Derivatives: Toward Self-assembling Molecular Electronics

Jeffrey Meisner, Chemistry

Faculty Mentor: Darren Johnson, Chemistry

Faculty Mentor: Colin Nuckolls, Chemistry, Columbia University

Hexabenzocoronenes (HBC) provide a unique scaffold for building discotic liquid crystals. Their shape is not entirely flat, allowing them to interdigitate and fortify the 1-dimensional columnar structures into which it self-assembles. These structures may afford interesting semi-conducting and photovoltaic properties previously unavailable in organic electronic materials. Recently, members of the Nuckolls group developed a convenient and robust synthesis of HBC from simple, inexpensive starting materials. The synthesis was modified to achieve many derivatives, including a dimer, trimer and the incorporation of crown ethers as ion channels. Through investigating the properties of the oligomers, we have gained further understanding of the stacking dynamics of the liquid crystalline derivatives of HBC, as well as discovered potentially new supramolecular structures.

The Rise of Ethnic Consciousness as an Active Political Force in Ethiopia: The Oromo and Amhara 1960-2006

Demie Shiferaw, International Studies / FHS

Faculty Mentor: Dennis Galvan,
International Studies / Political Science

Since the 1960s, the development of Oromo and Amhara ethnic consciousness has drawn attention to differences between these two groups and created ethnic political movements. Three factors—urbanization, education, and governmental discrimination—help explain the rise of Oromo/Amhara enforced cultural identity differences. Using a social and anthropological understanding of the historic and modern Oromo/Amhara conflicts, this research examines several related issues: the uses of ethnic consciousness as the base of an active political movement; how the rise of cultural identity led to political-ethnic conflicts; the overthrow of Mengistu Haile Mariam as a communist head of state of Ethiopia from 1977 to 1991; and post-1991 ethnic politics in Ethiopia.

Native Women in the Artworks of Pre-Hispanic Mesoamerica

Sharryl Sosa, Spanish

Faculty Mentor: Tania Triana, Romance Languages

Since the early 20th century, Mesoamerican art has been studied as anthropological and historical artifacts. Certainly much has been learned from these uses, but its value in the art history discipline has not been thoroughly explored. The main focus of this work is to explore the ideologies that have prevented this art from being elevated to the status of high art and being included in scholarly discussions of art history. The heterogeneity of Mesoamerican art holds much information about the pre-Hispanic past. This work will also explore the role of native women of Mesoamerica in order to draw a comparative analysis of contemporary Chicana artists based on the unique traditions of indigenous art.

Buffalo Bill and the White West: A Theoretical Analysis of White Supremacist Ideology in American Popular Culture

Margarita Wickham, Ethnic Studies

Faculty Mentor: David Vázquez, English

As one of the largest historical contributors to the western myth, *Buffalo Bill's Wild West* provides a way to analyze the social formation of a culture of "Whiteness." Few historians or philosophers have sought holistic explanations of how and why the *Wild West* has become such a dominant, influential theme in the American cultural imagination. The main goal of my research is to construct a critical model to analyze the performances of Buffalo Bill as recorded in advertising posters, newspaper stories and historical accounts to form a deeper understanding of the intersecting categories of race, ethnicity, class, and gender in the western myth. In the second phase of research, the critical model will be used to analyze two contemporary western films, *Dances with Wolves* (1990) and *Open Range* (2003). Several descriptive concepts—Marxism, racial and sexual contract social theory, the politics of identity, theatricality and performativity, cultural nationalism, and historical theories of imperialism—are key elements of a more effective ideological critique of the *Wild West*.

Applying the Murphy-Mikesell Framework to Indian and Tribal Peoples in the United States

Dennis Worden, Geography

Faculty Mentor: Alexander Murphy, Geography

The political aspirations of sub-national groups are influenced by their spatial organization. Murphy and Mikesell have addressed this issue from a political-geographic perspective to create a general framework that explains how spatial organization will influence the political aspirations of groups. Murphy and Mikesell developed a diagnostic formula, represented by rap/SAI, which explains group aspirations based on their particular territorial situations. The framework is designed to be applicable generally to many groups. To what extent, however, is the Murphy-Mikesell framework useful to explain the political-territorial aspirations of Indians and tribes in the United States? This paper suggests limitations to the usefulness of the framework when applied to the situations of tribes and Indian peoples in the United States and explores federal Indian policy, geography, theories of nationalism, and indigenous sovereignty to demonstrate these limitations.



Congress established TRiO programs to provide educational opportunities for all Americans regardless of race, ethnic background, or economic circumstances. As part of that tradition, the McNair Program at the UO is funded by a grant from the U. S. Department of Education and receives substantial institutional support to achieve its mission.



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