Social Influences on Social Essentialism: A Study of Negativity

Danielle Kennedy

Dr. Heather Littlefield, Project Advisor  
Dr. Craig Gruber, Second Reader  
Northeastern University, Linguistics Program and Psychology Department  
College of Science  
June 2013
Table of Contents

Abstract .................................................................................................................................................. 3

1 Introduction and Previous Research ................................................................................................. 4

2 Method .................................................................................................................................................. 9

2.1 Participants ....................................................................................................................................... 9

2.2 Materials .......................................................................................................................................... 9

2.3 Design ............................................................................................................................................. 13

2.3.1 Independent Variable: Generic Language ............................................................................... 13

2.3.2 Independent Variable: Evaluative Comments ......................................................................... 14

2.3.3 Independent Variable: Narrator Expertise ............................................................................. 14

2.3.4 Dependent Variable: Number of Essentialist Responses ..................................................... 14

2.4 Procedure ....................................................................................................................................... 15

3 Results ............................................................................................................................................... 15

3.1 Scoring ........................................................................................................................................... 15

3.2 Data and Individual Results ......................................................................................................... 16

3.3 Analysis ......................................................................................................................................... 18

3.3.1 Generic language induce more essentialist responses ......................................................... 18

3.3.2 Effects of negative comments on development of essentialist beliefs ......................... 18

3.3.3 Effects of authority and expertise on development of essentialist beliefs ...................... 19

4 Discussion ......................................................................................................................................... 19

4.1 Conclusion .................................................................................................................................... 23

Bibliography ......................................................................................................................................... 25

Appendix A: Slideshow Images ............................................................................................................. 28

Images for Picture Book A .................................................................................................................. 28

Images for Picture Book B .................................................................................................................. 31

Appendix B: Slideshow Texts ................................................................................................................. 34

Appendix C: Test Questionnaires ......................................................................................................... 35

Test Questionnaire for Picture Book (slide set) A ............................................................................ 35

Test Questionnaire for Picture Book (slide set) B ............................................................................ 37
Social Influences on Social Essentialism: A Study of Negativity
Danielle Kennedy

Abstract

Social essentialism is a cognitive bias that causes us to believe that certain social categories have an underlying essence that marks them as fundamentally distinct kinds. With this research, the goal was to learn if hearing negative language about a social category had an effect on the development about social essentialist beliefs, and if experts/authorities have a greater impact in the development of such beliefs than strangers. It was predicted that negative language would increase essentialist responses overall, and that both negative language and the influence of expertise would have a greater effect on essentialist beliefs in a context which has been previously demonstrated to increase such beliefs, generic language (Rhodes, Leslie & Tworek, 2012). Based on the methodology developed by Rhodes, Leslie, and Tworek (2012), participants were shown a series of pictures about a novel social group, accompanied by statements about the people in the pictures, using either generic or non-generic language. Each picture/statement was paired with a negative or positive comment referencing the statement, or no comment, and some participants were told the narrator was an expert on the content and some were given no information about the narrator. Social essentialist beliefs were measured by responses to inheritance, induction, and stability questions. Generic language did increase essentialist response, but there were no other significant effects, which may have been a result of the experimental design. This research will help researchers further understand the mechanisms of prejudice and the influence of language and parental input on stereotyping.
“Once you label me you negate me.”
— Søren Kierkegaard

1 Introduction and Previous Research

Controversial cultural anthropologist Margaret Mead once said in a well-known quote, “Instead of being presented with stereotypes by age, sex, color, class, or religion, children must have the opportunity to learn that within each range, some people are loathsome and some are delightful.” It is a fact of the world that there is variance within every group, and yet so often, we chalk differences up to “the exception to the rule.” Studies have shown time and time again that the human brain is built for categorizing (Medin, 1989), and this system serves us quite well when we are dealing with objects with simpler features (Treisman, 1986). But what happens when we encounter items that are not as easily categorizable, such as our fellow humans? How do our minds compensate for the aforementioned variance in the group? At what point do we decide that an entity has become too different to belong to the group? The fuzziness of these questions has actually become the root of the theory of psychological essentialism, a concept that, for all of its vagueness, appears to set in relatively early in childhood and persists and develops throughout adulthood. In light of a recent study on how cultural input (specifically, generic language) effects the emergence of essentialist beliefs about social categories in children (Rhodes, Leslie & Tworek, 2012), the current research seeks to expand upon this research by studying the effects of negative language and the relationship between the interlocutors on the development of essentialist beliefs in adults.

Essentialism did not actually begin as a principle for psychological study. The concept in fact finds its foundations in philosophy, perhaps the earliest in Plato’s Theory of Forms, which constitutes abstract, immaterial forms as the highest reality and the only true knowledge, as opposed to our sensory knowledge of the physical world (Elliott, 1967). Plato posited that although no one could say that they had ever seen a perfect circle, since its physical realization would be effectively impossible, every person still knows what a circle is; therefore, the ideal form itself must be real since everyone has this same concept of a circle. The more modern characterization of essentialism is actually not far off from the Classical interpretation. Richard Cartwright (1968) defines essentialism as the idea that any given entity or group possesses a set of critical attributes that are essential to its identity and membership to the group of others sharing the same defining attributes. Any one entity may also possess other accidental characteristics that are not necessary to its essence. For example, a tiger’s critical “essence” transcends the tiger’s surface features; the tiger may still be deemed a tiger if it is albino and stripe-less or has lost a limb or its tail (Hirschfeld, 1998). Essential properties are those without which a tiger would no longer be considered a tiger, and these attributes are not always easily articulated.

Douglas Medin (1989) was one of the first people to bring the concept of essentialism into psychology in a scientific manner. At the time, varying models of categorization were abundant, and the general consensus underwent several shifts before

---

1 Funding provided by the Gladys Brooks Award through the Northeastern University Honors Program
Acknowledgements: Thanks to Craig Gruber for helping with the statistics and analyses, and to Laura Brenner for being the voice of the narrator. IRB Approval #: 13-03-04.
Kennedy’s proposal. The earlier models, deemed similarity-based approaches, were still entrenched in metaphysical questions, and they argued that the similarity of attributes for an entity provides the conceptual coherence needed to group the concept with other like concepts. There are several issues with this approach, including the variability in relative weight and relevance of each attribute and the lack of prior means to construct relationships between properties. As such, the fact that we notice a similarity in attributes may actually be a result, as opposed to the cause, of grappling with the concept and explaining its attributes post-categorization.

The other main set of frameworks was the theory-based approach (Medin, 1989). Instead of assuming actual similarities were the vehicles providing conceptual coherence, the theory-based approach argued that concept organization is based on our previous knowledge and theories about the world. This model accounted for less salient categories and how we can judge new members of a category when similarity of the entities is not readily available, as well some variance from individual to individual we may find across categories. Medin notes, however, that theory cannot be fully disconnected from similarity. Cross-culturally, similarity appears to act as a constraint on causal explanations. It seems that when we are confronted with a novel event, we access similar events and their explanations in order to form a new one. It is very rare that a person would pull an explanation out of thin air; we are constantly trying to reconcile new knowledge with similarities to our existing knowledge.

Contrary to all of the categorical theories that prevailed at the time, Medin (1989) suggested that despite the numerous issues with the classical version of the similarity-based approach, the theory is not completely groundless. People do appear to act as though entities possess some type of underlying nature that defines them. Medin decided to look at this phenomenon not as an assumption about the world and the concepts themselves, but about how we think about them. This is a very important distinction between the various philosophical musings on essentialism and those of the psychological type. Psychological essentialism is not a theory about knowledge and the nature of reality, and it does not try to make any claims about how the world works; it is an argument about how humans represent entities within their cognitive processes. The knowledge bases that humans have about the world help us provide links from deeper to surface properties. As such, these inferences we make do have some statistical validity, and they tie together what is scientifically true of the world, and what we have internalized through cultural experience. Where similarity and theory-based approach had failed, psychological essentialism brought the two frameworks together.

It is not a stretch to envision how an essentialist heuristic, a strategy of categorization that might make us assume that entities that share surface features also usually share similar deeper properties (Medin, 1989), may have evolved in a different era to help our ancestors classify and make inferences about natural kinds (Barrett, 2001). One can imagine how it would have been important to make rapid kind-based evaluations when confronted with a possible predator or when deciding whether a plant is edible or poisonous. In the modern age, our essentialist tendencies have come to apply to categories more relevant to our lives now. Several studies have shown that people of a wide range of ages and cultures harbor essentialist beliefs about social categories (Rhodes, Leslie & Tworek, 2012). Therefore, we may define this subset of essentialist beliefs as social essentialism, a notion that specific social categories, such as gender, class, and ethnicity, are
marked by fundamental differences in their underlying, unchanging essences that determine their membership and characteristics.

It seems logical that social categories would be particularly susceptible to essentialist thought; a category like gender has both biological roots that surface in secondary sex characteristics, as well as cultural influences that further add to visible and tangible similarities across the group, and our perceptions of the attributes that are readily available will be further informed by the cultural and social knowledge and expectations we have accumulated through experience (Morton, Hornsey & Postmes, 2009). Social essentialism unsurprisingly is connected to the prevalence of stereotypes, and social essentialist beliefs have been linked to prejudiced thought. In a study conducted in Australia by Morton, Hornsey, and Postmes (2009), individuals who scored highly on an index of prejudice against Aboriginal Australians or Asians exhibited greater essentialist reasoning when the context was based on exclusion within a race-based category. However, essentialism is not always correlated with prejudice, and vice versa. The same study found that white prejudiced individuals actually showed more opposition, and therefore, less essentialist thinking, when the individual subjected to exclusion from a racial group was one of their own (i.e. white). Further, social essentialism may not always be used in a negative context. For example, individuals who are pro-lesbian, gay, bisexual, transgender, and queer/questioning (LGBTQ) might essentialize sexual orientation, while those prejudiced against LGBTQ people may tend towards a more constructivist line of thinking (Morton, Hornsey & Postmes, 2009). In this case, membership and existence of the group itself may be questioned by others, and so essentialism is brought into a different context, wherein LGBTQ group members must defend against a challenge to their very identity.

So it seems that essentialist thought is not absolute; however, it has been observed across age groups and cultures, so it appears to be pervasive among humans in general. In every sociocultural environment studied so far, children have been shown to develop essentialist beliefs by the age of four (Rhodes, Leslie & Tworek, 2012). However, children also seem to show only a limited range of such beliefs about culturally relevant social categories (Rhodes & Gelman, 2009; Haslam, Rothschild & Ernst, 2000). Further, the categories about which people may develop social essentialist beliefs vary heavily across cultures (Rhodes & Gelman, 2009; Mahalingam, 2007; Mahalingam & Rodriguez, 2006; Diesendruck & Haber, 2009). So what does this say about the mechanisms that cause us to develop such a manner of social categorization? Surprisingly, although a great deal of research has been conducted across age groups and cultures that substantiate the pervasiveness of essentialist beliefs, no research prior to a single study published last year (Rhodes, Leslie & Tworek, 2012) has investigated how these beliefs develop in relation to social categories. Based on previous research, it has been suggested that social essentialist beliefs are based heavily on cultural input. General essentialist reasoning is developed early on; however, it may take more time for children to gain adequate input to be able to apply these assumptions to social categories, especially depending on where they grow up and how much diversity is present within a particular category to which they are exposed. This would further explain why the types of essentialist beliefs a person holds varies across social and cultural contexts. We can conclude that the development of social essentialist beliefs, while evidently universal, is not merely the product of a biological predisposition, but involves significant variable input from one’s sociocultural environment.

The above mentioned study by Rhodes, Leslie, and Tworek (2012) examined what
may be regarded as one of the most important forms of cultural input: language. Specifically, the researchers found that generic language influences the development of socially essentialist beliefs in children and adults. Generic language refers to statements that describe a category in general rather than any specific member(s), as in, “cheetahs run fast.” Non-generic language refers to a specific individual or subset of a group, as in, “this cheetah runs fast” or “some cheetahs run fast.” Previous research has documented a similar causal effect in children about animal categories (Gelman, Ware & Kleinberg, 2010; Waxman, Lynch, Casey & Baer, 1997). The developmental link between generic language and essentialist beliefs makes sense in light of other evidence of how children conceptualize explanations for new information. Work by Kelemen (1999) proposed that children employ teleological explanations for natural entities and not just man-made or constructed items. Teleological explanations assume an entity is the way it is for a particular purpose. Kelemen found that preschool-aged children will attribute functions to almost every kind of object or part thereof. For example, while a mountain may be ideal for an enjoyable or challenged hike, the mountain does not exist “to be climbed.” However, if you ask a child what the purpose of a mountain is, with the explicit provision that it does not have to have a purpose or function, the child will still typically give the answer that mountains are “for climbing.” More recently, Kelemen and Rosset (2009) further demonstrated that adults show similar intuitions to approve of nonsensical teleological explanations when tested using subtler means. Work by Cimpian and Markman (2009; 2011) has further found that children produce these kind-specific, causal explanations when a property is described to them in generic language. When a non-generic description is used, children assume the attribute is incidental and not a result of category membership.

The current research was based on the methodology developed by Rhodes, Leslie, and Tworek (2012). In their study, children and adults were presented with a picture book illustrating the fictional people, Zarpies. Each illustration featured a Zarpie engaging in some activity or exhibiting a certain characteristic, and in one condition, each illustration was accompanied by a generic statement about the Zarpie’s action in the picture, while in the other, each picture was accompanied by a non-generic statement. Afterward, participants completed various test items that were shown to measure essentialist beliefs. In one experiment of the study, the picture book featured no words, and parents instead provided the narration of the book to their children. Parents were primed with an introductory paragraph that was designed to elicit either essentialist or non-essentialist beliefs about Zarpies. It was found that parents spontaneously produced more generic language in reference to the illustrations when they were primed with the essentialist text. The researchers also coded and analyzed the number of negative and positive evaluative comments about a Zarpie’s behavior. Parents were observed to produce more negative comments in the essentialist condition than in the non-essentialist condition, while positive comments showed no significant difference. This finding, only briefly touched upon in the article, raises questions as to whether there is an effect in the reverse direction, and inspired the current research proposal. In light of this finding, the aim is to discover if these negative comments themselves may influence the development of essentialist beliefs, specifically in a young adult population, in which social essentialism has not been studied as extensively as in child populations.

Further, most of the research on social essentialism in children credits these beliefs as precipitating from parental, and particularly maternal (Gelman et al., 2004), input. It
would seem that parents, who are usually the main source of linguistic input for their children up to a certain age, do play a key role in transmitting social essentialist beliefs to their young children, although they do not teach it explicitly (Gelman, 2003). Yet Rhodes, Leslie, and Tworek (2012) went so far as to assume enough similarity between parents and trained experimenters to generalize between the two as comparable across the experiments in their study, a potential oversight. It is just as possible that we cannot compare the influence of a parent to that of a stranger, and children may ascribe essentialist input differently, depending on who provides the language input to the child. Gelman and colleagues (Gelman et al., 2004) found that mothers and their children correlated positively in frequency of their use of generic language and other types of language related to gender stereotyping (i.e.: what a girl or a boy can or cannot do). This could be a result of the power and intimacy relationship between mother and child; however, similar results may have also been obtained if mother or child was speaking with a different person. If it is the case that children produce similar utterances as their mothers because they trust their mothers as authorities in passing on information, who acts as this authority when we are introduced to novel categories in our adulthood? To address this question, the present research tested whether adults developed more social essentialist beliefs when the information was dictated to them by an expert on the novel social category than by a stranger.

The research questions that were examined are: 1.) will generic language induce more essentialist responses overall; 2.) do negative comments influence the development of essentialist beliefs about social categories; and 3.) are people more likely to develop essentialist beliefs triggered by an authority figure or subject expert than by a stranger? It was predicted that there would be more essentialist responses in participants overall in the generic language condition than in the non-generic condition, and that we would also observe an especially significant interaction between the effects of generic language and negative comments on essentialist responses, such that negative comments would result in more essentialist responses in the generic language than the non-generic language condition. It was predicted that there would be no difference between the positive and no comment conditions, as Rhodes, Leslie, and Tworek (2012) found no main effect of positive language in either language condition. The expectation about the effects of generic language follows the findings of Rhodes, Leslie, and Tworek (2012). Generic language should elicit social essentialism because when people hear it in reference to a new property, they interpret it as making intentional generalizations about the category as a whole. Further, people tend to assume natural categories have kind-specific, causal (teleological) explanations for their properties, whereas a non-generic statement causes people to assume the attribute is incidental and not representative of any categorical attributes.

As for the negative comments, several bodies of research show that essentialist beliefs and negative social attitudes are related (Leslie, 2012; Haslam, Rothschild & Ernst, 2002; Dweck, 2009), so it stands to reason the negativity behind such attitudes stems from somewhere. As Baumeister and colleagues (2001) have evidenced in their seminal work on the negativity bias, a negative context produces a stronger emotional reaction than a positive context. Therefore, when people are introduced to a property of an entity in a negative context, negativity may breed more essentialist beliefs than would typically result from a generic statement. The prediction about the interaction between generic language and negative comments also stemmed from work by Levy and colleagues (Karafantis & Levy,
2004; Levy & Dweck, 1999) that shows people who harbor a belief in the immutability of categories are more likely to accept negative stereotypes. Participants may be primed by the generic language to think of the property as an absolute attribute of the category, and the negative comment in this context may augment essentialist modes of thinking.

It was also hypothesized that the number of essentialist responses in the expert-led condition would be greater with more generic use of language and/or more negative comments, but no difference would be observed for the stranger-led condition. When people are prompted to develop essentialist beliefs, they may be more likely to internalize it and apply the information later when the source of the information about an attribute is expected to give reliable information on the subject. In a recent fMRI study (Engelmann, Capra, Noussair & Berns, 2009), researchers tasked participants with a series of financial choices and found that when participants were first given advice from a financial expert about which choice to make (versus being given no advice), the decision-making regions of the brain essentially “shut down.” A study by Weisberg et al. (2008) found both educated and laypeople (but not neuroscientists) were more likely to accept an illogical conclusion if they were told brain scans showed the results. In the case of a novel category, a person may be more greatly influenced when information comes from someone who is purported to be an authority on the category. Adults may be more likely to embrace their own previous knowledge and experience of the world when the information giver is of questionable expertise, and they may be less inclined to simply accept the persuasions of a stranger.

2 Method

2.1 Participants
This study used 32 participants (26 female), with 4-5 participants in each of six conditions. Participants were recruited from the student body of Northeastern University, and the majority of the participants were undergraduates. Participants were aged between 18-26 years old (M=20.1). Only speakers whose native language is English (either English First Language speakers or speakers able to have native-like intuitions about English grammaticality) were admitted into the study.

2.2 Materials
Similarly to Rhodes, Leslie, and Tworek (2012), this experiment used two “picture books” designed by the experimenter, both of which were shown to each participant. The pictures and text were assembled into PowerPoint slides. Each slide presented one illustration, and the accompanying text for that illustration that was narrated to the participant. There were six slides, with six illustrations in all, for each book, so every participant saw a total of 12 images, which were the same for each participant. Whereas the previous research designed the Zarpie characters to be representative of actual human categories, equally diversifying them across sex, race/ethnicity, and age (Rhodes, Leslie & Tworek, 2012), the drawings in this experiment replaced these characters with detailed stick figures performing the actions. Although the characters in Rhodes, Leslie, and Tworek’s study were equally distributed across social categories, these were still actual social categories, and we have no way to adequately control for any of the participants’ preconceived notions about human categories and how they may relate to the scenarios in the book. Diversifying the group does not make it impervious to essentialist thought; Americans, for example, are a
diverse group in terms of ethnicity and race, but Americans as their own category are still subject to countless stereotypes like any other group. Since it is still not fully understood what attributes any given person may use to construct a category and subsequent beliefs about that category, it seemed wiser to present the characters with as few as possible distinguishing features, which could have otherwise caused participants to draw from previous knowledge about social groups they have encountered. Further, in the previous study, the Zarpies all wore similar clothing, which may have signaled a cohesive group and affected the results; the use of stick figures eliminated the need to think about such features. See Figure 1 below for a sample slide with a Zarpie illustration and conditional text. See Appendix A for all twelve illustration samples.

Look at this Zarpie!

A Zarpie eats dirt everyday.

Isn’t that neat?

Figure 1: Slide 1 from Picture Book A, featuring an illustration and the text for the generic language/positive evaluative comment condition.

Each slide set was prefaced with an instructional slide (Figures 3 & 4). The instructions for each condition were identical, except in the expert-led condition, in which the narrator of the text was introduced as the creator of the picture book, participants were told the text would be narrated by the author, and in the stranger-led condition, in which the narrator was not described in any way, they were only told the text would be narrated. To help the participants understand the context of the pictures and to help ensure that they recognize that the stick figures are meant to represent “real” human beings, each set of picture book slides were prefaced with a brief introductory paragraph on the first page, following the instructions. See Figure 2 for the text of this paragraph.

Some explorers went to a far-away place and met some people living there. We will call them Zarpies. The explorers made this book to tell you about their trip.

Figure 2: Introductory Paragraph for Picture Books.
The following images and text are selected samples from a picture book designed for children. Original images have been replaced by the researchers.

You will be shown 6 images, one at a time, and the text will be narrated for you. The next image will display automatically after a given time. You will be given a series of questions to answer after the presentation, so please pay attention.

If you understand the instructions, click here to continue.

Figure 3: Instructions for Stranger-Led Condition.

The following images and text are selected samples from a picture book designed for children. Original images have been replaced by the researchers.

You will be shown 6 images, one at a time, and the text will be narrated for you by the author of the picture book, who created the characters. The next image will display automatically after a given time. You will be given a series of questions to answer after the presentation, so please pay attention.

If you understand the instructions, click here to continue.

Figure 4: Instructions for Expert-Led Condition.
Each picture was accompanied by a statement about the action or characteristic of the Zarpie featured in the picture. The statement varied in use of generic or non-generic language as specified by the condition. For example, an illustration featuring a Zarpie happily eating flowers was accompanied by the text, “A Zarpie likes to eat flowers,” in the generic condition, or “This Zarpie likes to eat flowers,” in the non-generic condition. In the negative and positive comment conditions, each statement was directly followed by a negative or positive evaluative comment, respectively, or no comment in the null comment condition. In the study by Rhodes, Leslie, and Tworek (2012), parents were found to spontaneously produce more negative comments in reference to each statement about Zarpies when they were primed by an essentialist paragraph about Zarpies. The comments were designed to follow the format of one common pattern of comment that the parents gave, so for the negative condition, an example of an evaluative comment would be, “Isn’t that gross?” and for the positive condition, a comment could be, “Isn’t that cool?” See the design section below for a more detailed explanation of how the texts were manipulated. See Appendix B for the accompanying text for each illustration by condition.

To measure whether participants had developed an essentialist belief about any of the picture book items, this study used questions about inheritance, induction, and category stability, as modeled in Rhodes, Leslie, and Tworek (2012) and demonstrated to be applicable measures of essentialist belief in other studies (Hirschfeld, 1995; Taylor, Rhodes & Gelman, 2009; Waxman, Medin & Ross, 2007; Gelman & Wellman, 1991; Atran et al., 2001). On each questionnaire, there were two questions each about induction and stability. One item for each question type asked about a characteristic mentioned in the picture book, and the others asked about newly introduced traits. There were three inheritance test items because these items seemed less ambiguous in how they could be interpreted and seemed less likely to be potentially influenced by other factors. Of the inheritance items on each questionnaire, two items asked about traits discussed in the book and one asked about a novel trait not previously mentioned.

For inheritance items, participants were told that a baby was born to a Zarpie mom but raised by a non-Zarpie mom. The Zarpie mom was described as having a certain characteristic, either from the book or a novel trait (i.e. “The Zarpie mom likes to eat flowers), while the non-Zarpie mom had a parallel but different characteristic (i.e. “The non-Zarpie mom likes to eat tree bark”). Participants were asked which characteristic the Zarpie baby grew up to have, that of the Zarpie mom or the non-Zarpie mom. These test items follow the rationale that if a person has the trait of their biological birth mother despite never having met her, they are born with it and it is an unchangeable, underlying “essential” characteristic (Rhodes, Leslie & Tworek, 2012).

For induction items, participants were reminded of a Zarpie in the story or introduced to a new Zarpie with a certain trait and asked whether another Zarpie was likely to also have that trait. If a person thinks a trait is extendable to other members of a category, this suggests that it is necessary and essential for category membership.

For stability questions, participants were told a Zarpie, aged 10 years old, had a trait, either from the book or a previously unmentioned trait, and were asked if it was likely that

---

2 The questionnaires also included another test item, explanation questions, for which participants were asked to recall a Zarpie from the story and write why they possessed a certain trait in short answer format. The qualitative results of these items were not included in this paper because the experimenter found no significant patterns.
the Zarpie had that trait at age 4 and if they would continue to have that trait as an adult. If the person thinks a characteristic is present throughout an entity’s lifetime or existence, this suggests category stability and immutability, again signifying necessity to category membership. See Appendix C for the original questionnaires for each slide set.

2.3 Design
The experimental design incorporated three different independent variables and one dependent variable.

2.3.1 Independent Variable: Generic Language
This variable manipulated whether the text describing each picture is written in generic or non-generic language. This variable was manipulated within subjects. Generic language may be defined as statements that describe a kind or category, rather than any particular individual within (or outside) that category (Carlson & Pelletier, 1995; Leslie, 2008). In English, a generic statement may take the form of a bare plural sentence, in which the subject noun is inflected for plurality but does not attach to any articles (as in, “cheetahs run fast”), or it may be an indefinite singular sentence, in which the subject noun is singular and carries the indefinite singular article, ‘a’ (as in, “a cheetah runs fast”) (Leslie, 2008). In the examples, both of these structures express a piece of information about the category ‘cheetah,’ as opposed to any one cheetah, or even all of cheetahs (as a subset). Because it is indefinite, the indefinite singular generic form is understood to refer to the category and not a specific single member. Conversely, non-generic statements will refer to a particular individual or some subset of the group and will use definite articles to denote specificity. Examples would include, “this cheetah runs fast” or “some cheetahs run fast.”

This experiment used the indefinite singular for the generic condition. This allowed the researcher to control for grammatical singularity. If the experimenter were to use the bare plural noun phrases, it would be possible that any differences in the results could simply stem from the difference in grammatical singularity or plurality in each condition (Rhodes, Leslie & Tworek, 2012). Sentences in the generic condition always started with the noun phrase, “A Zarpie…” (as in, “a Zarpie likes to eat flowers”). The non-generic condition began each phrase with, “This Zarpie…” (as in, “this Zarpie likes to eat flowers”). All phrases, regardless of generic quality, were prefaced with the sentence, “Look at this Zarpie!” to better draw the participant’s attention to the current image and text. Each condition was introduced across 6 consecutive slides. One book (set of 6 pictures) featured the generic language for each participant, while the other book featured the non-generic language.

The generic language variable was also counterbalanced as follows. Picture book A featured images 1-6 and picture book B featured images 7-12 (refer to Appendix A). An approximately equal number of participants were shown picture book A first as were shown book B first. Similarly, of the participants who read book A first, there were an approximately equal number of participants who had the generic condition and the non-generic condition for book A. The same applied for book B. This was balanced across conditions. See Figure 5 for a visual representation of the counterbalancing procedure.
2.3.2 **Independent Variable: Evaluative Comments**

For this variable, the experimenter manipulated whether the text of the picture books had a negative, positive, or neutral valence. This variable was manipulated between subjects, over the 12 slides per participant (the number of pictures in the two books) for each comment condition. Each statement for each picture was matched with a negative, a positive, or no evaluative comment, depending on condition, so this variable was not counterbalanced, and it was not feasible or necessary to randomize comments for pictures across participants in a given condition.

In the negative comment condition, each picture statement for both books was followed by a comment that evaluated it in a negative light. For example, if the statement was “A/This Zarpie likes to eat flowers,” it would be followed by a negative comment, such as, “Isn’t that yucky?” The positive comment condition similarly used positive evaluative comments. A positive comment to the above example would be something like, “Isn’t that cool?” The no comment condition featured no additional comment on the statement and served as the control condition. Refer to Appendix B for all comment texts used.

2.3.3 **Independent Variable: Narrator Expertise**

This variable manipulated the identity of the person who narrated the picture books to the participant. This variable was manipulated between subjects, and the narrator was given the same identity for sets of slides that a participant viewed.

Although all text across all variables and conditions was narrated by the same person to ensure consistency across conditions, the narrator was introduced differently in the initial instructions to each participant, depending on their assigned condition. Refer back to Figures 3 and 4 above for exact text used. In the expert-led condition, the narrator was introduced to the participant as the author of the book and creator of the Zarpie characters, therefore making the narrator an “expert” on the contents of the book. In the stranger-led condition, the instructions simply mentioned the slides would be narrated, but there was no description of the narrator.

Half of the participants were told the narrator was the expert, and the other half were not told any details about the narrator. The expert and stranger-led conditions were further divided into each of the three comment conditions (as described above), so in the end, there were 4-5 participants in each of following overall conditions: parent-positive, parent-negative, parent-no comment, experimenter-positive, experimenter-negative, and experimenter-no comment.

2.3.4 **Dependent Variable: Number of Essentialist Responses**

The measured variable was the total number of essentialist responses (out of 9) that each participant chose for each genericity condition. A response was defined as essentialist
differently for each question type. For inheritance questions, a response was coded and scored as essentialist if the participant circled the trait that corresponded with that of the Zarpie mom, and as non-essentialist if they chose the other trait (of the non-Zarpie mom). For induction items, a response was defined as essentialist if the participant circled “Yes, it is likely [that Zarpie Y also has this trait],” and as non-essentialist if they circled “No, it is not likely.” For stability questions, a response was coded as essentialist if the participant circled “Yes, it is likely [that the Zarpie had/has this trait as a young child/adult],” and as non-essentialist if “No, it is not likely” was circled.

2.4 Procedure
After the experimenter had explained the study, answered any questions from the participant, and obtained written consent, the participants were presented with the first slide set. At the beginning of each slide set, participants were instructed verbally by the experimenter to read the directions on the first slide and click the link when they were ready to continue. They were told that they did not need to press any other buttons after that point because the slideshow would run automatically, and that they should let the experimenter know when they had reached the blank slide at the end of the set. Participants then read the written instructions on the first slide, and after they clicked the link to begin, each slide for the first set was shown consecutively. After the slide set had been completed, the experimenter gave the participant the first questionnaire and instructed the participant to fill it out using their first instincts. When the participant had completed the questionnaire, the experimenter presented the second slide set and told the participant that the instructions and setup were the same as for the previous set of slides. The same procedure was followed for this second picture book slide set, and after completion, the participant was given the second questionnaire, again with the same instructions. Upon completion of the second questionnaire, the experimenter recorded the participant’s sex and age on each questionnaire. The participant was then debriefed, thanked, and given compensation ($5 gift certificate to Starbucks). A full experimental trial lasted about 10-15 minutes for each participant.

3 Results

3.1 Scoring
To quantify and analyze the incidence of essentialist beliefs in the participants, the experimenter assigned a score of 1 or 0 to every survey question response. For inheritance questions, a score of 1 was assigned to each response that indicated the inheritance of the Zarpie mom’s trait, and a score of 0 was assigned to each response that the Zarpie baby would grow up with the non-Zarpie mom’s trait. For induction items, a score of 1 was given if the participant indicated it was likely that another Zarpie would have the trait of the initial Zarpie; a score of 0 was given for a response that it was not likely. For stability questions, a score of 1 was assigned when the participant indicated it was likely that the Zarpie would retain/had retained its trait at a different age; a score of 0 was given if the participant responded that it was not likely. A separate score was given for each part of the question (4 years old and adult). A score of 1 for any given test items indicates an essentialist response, and the scores for each response will be totaled to find the overall number of essentialist responses for each participant by generic language condition. A
participant could score between 0 and 9 for each questionnaire. These totals were used to find the mean number of essentialist responses across participants by condition. There were 5-6 participants in each condition. See Figure 6 for a summary of the number of participants by condition type.

<table>
<thead>
<tr>
<th>Narrator Identity</th>
<th>Comment Affect</th>
<th>Positive</th>
<th>Negative</th>
<th>Null</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert</td>
<td>Positive</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Stranger</td>
<td>Negative</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>32</td>
</tr>
</tbody>
</table>

Figure 6: Number of Participants by Condition.

3.2 Data and Individual Results

The following tables show which participants were in which between-subjects conditions and how each participant answered each question in both the generic and non-generic conditions (Gen or Non-Gen).

In each table, S refers to subject number (which also corresponds to the order in which participants were tested). Q refers to question number. This was the same for both questionnaires because each contained the same question types, which appeared in the same order for both. Each table also shows which questions corresponded to which question type (inheritance, induction, or stability) and whether the question referred to a Zarpie trait that was mentioned in the book or a new trait (book or non-book). As mentioned in the previous section, a score of 1 was given for an essentialist response to a question, and a score of 0 indicates the participant chose the non-essentialist response. The total number of essentialist responses for each participant for each questionnaire is given at the bottom of the table, highlighted in yellow.

Figure 7: Individual Subject Responses by Question Type and Genericity Condition for the Stranger Narrator/Positive Comment Condition.
<table>
<thead>
<tr>
<th>Figure 8: Individual Subject Responses by Question Type and Genericity Condition for the Expert Narrator/Positive Comment Condition.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inheritance</strong></td>
</tr>
<tr>
<td><strong>Q3 (book 1)</strong></td>
</tr>
<tr>
<td><strong>Q4 (book 2)</strong></td>
</tr>
<tr>
<td><strong>Induction</strong></td>
</tr>
<tr>
<td><strong>Q5 (book)</strong></td>
</tr>
<tr>
<td><strong>Q6 (non-book)</strong></td>
</tr>
<tr>
<td><strong>Stability</strong></td>
</tr>
<tr>
<td><strong>Q7 (book)</strong></td>
</tr>
<tr>
<td><strong>Q8 (non-book)</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure 9: Individual Subject Responses by Question Type and Genericity Condition for the Stranger Narrator/Negative Comment Condition.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inheritance</strong></td>
</tr>
<tr>
<td><strong>Q3 (book 1)</strong></td>
</tr>
<tr>
<td><strong>Q4 (book 2)</strong></td>
</tr>
<tr>
<td><strong>Induction</strong></td>
</tr>
<tr>
<td><strong>Q5 (book)</strong></td>
</tr>
<tr>
<td><strong>Q6 (non-book)</strong></td>
</tr>
<tr>
<td><strong>Stability</strong></td>
</tr>
<tr>
<td><strong>Q7 (book)</strong></td>
</tr>
<tr>
<td><strong>Q8 (non-book)</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure 10: Individual Subject Responses by Question Type and Genericity Condition for the Expert Narrator/Negative Comment Condition.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inheritance</strong></td>
</tr>
<tr>
<td><strong>Q3 (book 1)</strong></td>
</tr>
<tr>
<td><strong>Q4 (book 2)</strong></td>
</tr>
<tr>
<td><strong>Induction</strong></td>
</tr>
<tr>
<td><strong>Q5 (book)</strong></td>
</tr>
<tr>
<td><strong>Q6 (non-book)</strong></td>
</tr>
<tr>
<td><strong>Stability</strong></td>
</tr>
<tr>
<td><strong>Q7 (book)</strong></td>
</tr>
<tr>
<td><strong>Q8 (non-book)</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>
3.3 Analysis

3.3.1 Generic language induces more essentialist responses
It was predicted that there would be more essentialist responses in participants overall in the generic language condition than in the non-generic condition. Using a 2 (Genericity) x 3 (Comment) x 2 (Narrator) mixed ANOVA on the number of essentialist responses, it was found that there was a main effect of genericity ($F=4.439, p=.045$), so responses differed significantly between the generic and non-generic language conditions. Specifically, it was found that participants made more essentialist responses overall in the generic language condition ($M_{generic}=5.44, M_{non-generic}=4.63$). These results supported the initial hypothesis.

3.3.2 Effects of negative comments on development of essentialist beliefs
It was predicted that there would be a significant interaction between the effects of generic language and negative comments on essentialist responses, such that negative comments would result in more essentialist responses in the generic language than the non-generic language condition, but that there would be no difference for the positive and null comment conditions. Results of a 2 (Genericity) x 3 (Comment) x 2 (Narrator) mixed ANOVA showed that there was no significant interaction between genericity and comment affect ($F=.161, p=.852$). This did not support the hypothesis on the effects of negative
comments in combination with generic language on essentialist responses. There was also no main effect of comment affect on its own \( (F=.501, p=.611) \). However, there was a potential marginally significant interaction between the two between-subjects variables, comment affect and narrator identity \( (F=1.793, p=.186) \), and a comparison of the means suggests that there may have been marginally more essentialist responses in the positive comment condition when the narrator was introduced as an expert/authority \( (M=5.833) \) than when the narrator was not introduced \( (M=3.833) \). Refer to Figure 13 for a graphical representation of this interaction.

![Mean Number of Essentialist Responses by Comment and Narrator](image)

**Figure 13:** Mean Number of Essentialist Responses by Comment Affect and Narrator Identity

### 3.3.3 Effects of authority and expertise on development of essentialist beliefs

It was hypothesized that there would be more essentialist responses in the expert-led condition when combined with generic use of language and/or more negative comments, but no difference would be observed for the stranger-led condition. There was no main effect of narrator identity \( (F=.888, p=.355) \), nor were there any significant interactions between narrator and genericity \( (F=.579, p=.454) \) or narrator, genericity, and comment affect \( (F=.910, p=.415) \). Again, the hypothesis was not supported.

### 4 Discussion

Out of all of the results, only one piece of the hypotheses was clearly supported. It was predicted that there would be more essentialist responses in participants overall in the generic language condition than in the non-generic condition, and the results supported this hypothesis. Participants did make more essentialist responses overall in the generic language condition than in the non-generic language, which suggests language that is generalized prompts people to develop more intrinsic and stereotyped beliefs about
unfamiliar social categories. This result supports the previous body of research (Cimpian & Markman, 2009; 2011; Gelman, Ware & Kleinberg, 2010; Waxman, Lynch, Casey & Baer, 1997) and replicates the findings of the study by Rhodes, Leslie, and Tworek (2012). This finding also suggests that manipulation of genericity as a within subjects variable is a viable variation on the between subjects model typically used for studying this variable, which opens up many more experimental design possibilities and interaction effect models for this type of research in the future. Since each participant was tested with both generic and non-generic language in separate counterbalanced trials about the same fictional group of people, the results suggest that language may have a stronger effect upon the emergence of essentialist thinking than previously anticipated. Manipulated within subjects, the two conditions of the genericity variable could have easily interfered with each other. For example, if a participant was presented with a non-generic set in the first trial, the individual could have been so influenced by the non-generic language about the Zarpies that this initial knowledge about certain Zarpies and their traits could spill over into the next trial, so that the generic language would have little effect because the participant had already formed a belief about Zarpies as a group or as individuals based upon the original non-generic language use. However, this appears not to be the case and therefore may suggest that people are strongly factoring in the genericity of statements when learning about new social categories from others, whether they are aware of this tendency or not. This could help explain why people adapt to the beliefs of the community around them. If a person is cued by a certain use of language to apply a particular heuristic for categorization, that person will be more influenced to categorize in this manner if he/she is constantly hearing linguistic cues from their fellow community members.

However, this finding was not surprising, and the results in which we were truly interested were the interactions. The experimenter had also predicted that negative comments and/or the expert narrator would increase the number essentialist responses in the generic language condition; however, there was no main effect of comment affect or narrator identity, nor were there any significant interactions between genericity and comment, genericity and narrator, or genericity, comment, and narrator. Interestingly, there may have been an interaction of marginal significance between comment and narrator, wherein there were more essentialist responses in the positive comment condition when the narrator was the expert, which was not anticipated by the experimenter. Unfortunately, the findings of the experiment did not produce the expected outcomes.

As one would expect, not every instance of generic language about a novel category automatically induces essentialist thinking. If this were the case, participants would have all scored 9 for essentialism on the generic condition questionnaires. Further, in the real world, judgments, even those about unfamiliar categories, do not occur in a bubble without context. Humans integrate their previous knowledge and experiences of the world and social categories (Medin, 1989). Because this kind of linguistic cue is so strongly linked with social elements, it was very surprising that the identity of narrator presenting the information did not have an effect on the development of essentialist beliefs when generic language was used. It would seem possible that people would be more likely to utilize an easy categorization process (in this case, essentializing a social category based on linguistic cues) and conform when they feel they can trust the source of the linguistic cue. If they have no reason to trust the source, they might be in a heightened state of arousal and
awareness, so they may be more likely to think more carefully about what to assume about the given information. So what made some participants “think for themselves” more than others?

It may have been the case that introducing the narrator as the creator of the book was not enough to induce the idea that the narrator was an expert or authority on matters concerning the social category of Zarpies. Since the slides were designed to look like a children’s book, the Zarpie social group was created as a fictional group of people. The experimenter assumed that since the group was fictional and the adult participants knew this, a suitable introduction had to be given to make the scenario of the study seem realistic to the participants. It may have been better to tell the participants that the experimenter was pilot testing the study to be conducted in children. If the experiment had proceeded in this fashion, it may have been more acceptable to adult participants to talk about the fictional Zarpies as a real social group, albeit one with which they were unfamiliar. If the introductory language had been more explicit, either by saying outright that the narrator was an expert on Zarpies or by giving details about the narrator that people associate with expertise (i.e. that the narrator had studied Zarpies for many years and knew everything there is to know about them), participants would have been more swayed by the expert narrator. In a similar manner, the stranger condition may have needed to be differentiated from a control condition, in which the narrator was not introduced. The stranger narrator could then have been introduced as someone untrustworthy. The experimenter assumed that it would be better to keep the narrator condition vaguer so that participants would not guess the purpose of the experiment; however, in this case, more conclusive results may have been seen if this variable had been more explicit.

Much of the research in essentialism has been conducted in young children, in the context of developmental studies. While it is true that adults are certainly susceptible to essentialist thinking and over-generalizing categories, children are indeed much more malleable, and they still are trying to learn how the world works and who to trust. The notion of the narrator as an expert may simply have been introduced in too subtle a manner, either for participants to take notice or to be fully convinced that they should consider the narrator as an authority on this subject. Following the methods of Rhodes, Leslie, and Tworek (2012), the proposal for this experiment was originally designed to be conducted in child participants, as the original study off of which this was based was a developmental study. It is possible that more of the desired results would have been observed if this experiment had been conducted in such a population. Children are more impressionable and may have been more susceptible to such influences, whereas adult participants may have more easily guessed the purpose of the experiment and may have attempted to adjust their answers accordingly in order to appear more favorably.

Further, when modifying the experiment to be conducted in an adult population, the experimenter speculated that since children seemed more influenced by their parents in this respect (Gelman, 2003; Gelman et al., 2004), essentialism in adults might also be augmented when the information was given by a trusted source. Based on studies that suggest that even educated people may be swayed falsely by expertise (Weisberg et al., 2008) or that the brain might use expert advice as a shortcut to decision-making (Engelmann, Capra, Noussair & Berns, 2009), it seemed reasonable to hypothesize that if participants were indeed cued by generic language to formulate essentialist beliefs, they would be more inclined to this presumption when the generic language was provided by an
expert narrator. However, the results of this experiment did not support this conclusion. It may be as simple as since the narrator was not specifically introduced as an expert on Zarpies, the participants did not recognize that the narrator was meant to function in an expert capacity. The experimenter did not want the narrator identity variable to be too obvious to the participants, but perhaps people trust a purported expert more when their expertise is vouched for by another party.

It is also possible that the sample population affected the outcome of the experiment. Nearly all of the participants were undergraduate students at Northeastern University, with a mean age of about 20. It is possible that this particular population, as educated Millennials, may be more skeptical of supposed expert opinions. According to a Capstrat-Public Policy Polling survey (2010), more pollies between the ages of 18 and 29 judged traditional medical sources, such as doctors and pharmacists, as less reliable sources of medical information than did other age brackets. A report on Millennials by the Pew Research Center (2010) found the same 18-29 age group were less likely to respond that most people can be trusted than older age groups, a trend that has persisted for some decades. If this experiment had been conducted across a more diverse age population, perhaps the expert narrator would have influenced participants’ responses more.

A significant interaction between genericity and comment affect was not observed either. It was predicted that negativity would increase participants’ tendency to fall back on essentialist assumptions when presented with a generic language cue. When Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) first proposed that “bad is stronger than good” in their now classic study, they suggested that evolutionarily, human response to a negative stimulus elicited heightened awareness more so than a positive stimulus and indicated a need for us to self-regulate and adapt quickly. Essentialist thinking also developed as a type of heuristic to help humans quickly categorize and make rapid decisions (Medin, 1989). However, the hypothesized interaction was again not observed.

These findings may have resulted from the small sample size of this experiment. Perhaps many participants were, in fact, “thinking for themselves,” simply based upon natural differences in the population. Just as in the population at large, some people are less prone to develop stereotypes about others, some participants may have been less predisposed to develop essentialist beliefs than others. As the study used a small sample size and short questionnaire format, there may simply not have been enough people answering enough questions or being shown enough slides for the experimenter to discount the effects of natural differences in the study sample. Since comment affect was a between-subjects variable with three different conditions, one or two participants in any of the comment conditions who were more or less predisposed to develop essentialist beliefs would have been enough to significantly skew the results. Perhaps if comment affect had been manipulated within subjects, the results may have been more informative.

The images were described as part of a children’s picture book in an attempt to offset the nature of the comment affect condition; however, this method may have been too contrived. Participants may have been distracted by the fact that both the images and text were somewhat “silly;” many participants were giggling during trials. This also may have skewed questionnaire results because participants may not have taken the slideshow seriously and did not focus, as some participants became anxious when beginning their first questionnaire, thinking it was a memory test and convinced they had missed some details in the slides. Some of the characteristics of the Zarpies may have also been viewed
as distinctly negative or positive, despite the comment affect. The experimenter attempted to create characteristics that were both novel (would not elicit preconceptions) and neutral (would make sense with both a negative and a positive comment in the different conditions). While any individual participant may have had a previous affective context for one or more of the Zarpie traits, due to personal experiences that could not be prevented or realistically pre-screened, some of the traits may just be viewed as inherently positive or negative by the majority of the adult population (at least in this population). To assess whether the traits were an issue, a post-study pilot test could be conducted across a much larger and diverse sample size, wherein a survey could be designed to determine if adults in general associate each trait with positive, negative, or neutral feelings. This testing would also help to redesign this study, as new, alternative traits could be tested as well.

In a future study, researchers also might consider presenting the novel social category in person, rather than via recording, and introducing comment affect in a more organic manner, so as to better imitate the circumstances in which such comments arose in the study by Rhodes, Leslie, and Tworek (2012). Conversely, the comments may not have been positive or negative enough. The experimenter was tasked with conjuring negative comment words that would be plausible as part of a children’s story; however, they may not have been sufficiently negative in the eyes of adult participants.

Interestingly, while an interaction was not observed where predicted, the statistics suggests that further research may want to examine a possible link between positive affect and narration by an expert. The researcher believes this potential finding is more likely a fluke, since there was no difference for this interaction between the generic and non-generic conditions; however, it is possible that these two conditions combined in a way that caused participants to answer more essentialistly. While each of these two conditions did not inspire more essentialist responses on their own, perhaps in combination, they were able to elicit a strong enough reaction. For example, the positivity and the reassurance of a subject matter authority may have put participants in a more relaxed, unguarded mental state, and the brain may have leaned on its easy default of assuming that members of a category are similar. Again, this is all conjecture, and since this interaction was only marginally significant, this was likely just an anomaly in the data or the result of faulty experimental design.

4.1 Conclusion
Independent of the results that have been found, this study was designed so as to be replicable in other social and cultural contexts, with adjustments for linguistics differences. While the findings of the present study may or may not have certain implications about a subset of the population, it would be unwise to assume all populations behave in the same manner, particularly with the considerable body of evidence that demonstrates vast cultural variation in the manifestation of social essentialism (Rhodes & Gelman, 2009; Mahalingam, 2007; Mahalingam & Rodriguez, 2006; Diesendruck & Haber, 2009). Alternatively, if there is something universal about the way we conceptualize social categories, it is important to get to the theoretical bases for these constructs. Different languages express generic statements, negativity, and category stability in different ways, as in Spanish, in which ser and estar, two forms of the verb ‘to be,’ indicate permanency or temporariness of an attribute, respectively, and guide inferences about category constancy (specifically in children in the study) (Heyman & Diesendruck, 2002). Different cultures
may also hold authority figures in different regards. Sheena Iyengar’s TED talk about cultural differences in choice comes to mind; specifically, the outcome of an experiment in which Japanese children wanted to impress their mothers by “doing as they were told” or what they believed their mothers had chosen for them, as compared to American children who wanted to assert their independence in the same task and balked at the choices their mothers supposedly made for them (2010). Both within and cross-culturally, it is vital to study how beliefs about social categories develop. If we don’t know where they come from, how can we educate people about change?

6 Bibliography


7 Appendices

7.1 Appendix A: Slideshow Images

Images for Picture Book A (not in order of appearance):
Images for Picture Book B (not in order of appearance):

7.2 Appendix B: Slideshow Texts

Each picture description and comment was prefaced by the phrase, “Look at the Zarpie!” The picture description was followed by either the negative or positive comment or no comment, depending on the condition. The picture description began with either ‘a’ or ‘this’ (not both), again depending on the genericity condition.

<table>
<thead>
<tr>
<th>Picture Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/This Zarpie eats dirt every day.</td>
<td>Isn’t that neat?</td>
</tr>
<tr>
<td>A/This Zarpie does a handstand when it rains.</td>
<td>Isn’t that fun?</td>
</tr>
<tr>
<td>A/This Zarpie yells at lions to scare them away.</td>
<td>Isn’t that brave?</td>
</tr>
<tr>
<td>A/This Zarpie hops in puddles.</td>
<td>Isn’t that delightful?</td>
</tr>
<tr>
<td>A/This Zarpie can stand on</td>
<td>Isn’t that amazing?</td>
</tr>
</tbody>
</table>
one foot for hours.

| A/This Zarpie loves to hide in caves. | Isn’t that cool? | Isn’t that creepy? |
| A/This Zarpie has lots of freckles. | Isn’t that lovely? | Isn’t that unfortunate? |
| A/This Zarpie is good at knocking over big trees. | Isn’t that impressive? | Isn’t that rotten? |
| A/This Zarpie gets sweaty even when it’s snowing. | Isn’t that fascinating? | Isn’t that awful? |
| A/This Zarpie sleeps standing up. | Isn’t that spectacular? | Isn’t that strange? |
| A/This Zarpie sings very loudly. | Isn’t that remarkable? | Isn’t that annoying? |
| A/This Zarpie sneezes every time a bird flies by. | Isn’t that extraordinary? | Isn’t that terrible? |

7.3 **Appendix C: Test Questionnaire for Picture Book (slide set) A**

(For Sets A & B) Question 1: Explanation items; 2-4: Inheritance items; 5-6: Induction items; 7-8: Stability items
Please answer each of the questions below using only the information provided by the picture book you have just seen. You may take as much time as you need, but please try to answer with your initial instincts.

1. Remember the picture in the story of the Zarpie who can stand on one foot for hours? Why can this Zarpie stand on one foot for hours?

2. A Zarpie mom who doesn’t like to be in the sun gives birth to a baby, but she is not able to raise the baby. Someone from another village, who is not a Zarpie and likes to be in the sun, volunteers to raise the baby. The baby is raised by the person from another village immediately from birth and never sees the Zarpie mom again. When the baby grows up, is it more likely to like the sun or dislike the sun?

   Please circle one:  
   
   Like     Dislike

3. If a Zarpie mom who eats dirt everyday gives birth to a baby that is raised by a non-Zarpie mom who eats sand everyday under the same circumstances as above, will the baby be more likely to grow up to eat dirt or sand everyday?

   Please circle one:  
   
   Dirt     Sand

4. If a Zarpie mom who yells at lions to scare them away gives birth to a baby that is raised by a non-Zarpie mom who runs away from lions under the same circumstances as above, will the baby be more likely to grow up to yell at lions or run away from them?

   Please circle one:  
   
   Yell     Run away
5. In the story, one picture showed a Zarpie who loves to hide in caves. There is another Zarpie named Y. Is it likely that Zarpie Y loves to hide in caves?

Please circle one: Yes, it is likely No, it is not likely

6. A Zarpie named X walks very fast all the time. Is it likely that Zarpie Y also walks very fast all the time?

Please circle one: Yes, it is likely No, it is not likely

7. A Zarpie is 10 years old and can jump very high. Is it likely that this Zarpie could jump very high at 4 years old?

Please circle one: Yes, it is likely No, it is not likely

Is it likely that this Zarpie will be able to jump very high as an adult?

Please circle one: Yes, it is likely No, it is not likely

8. A Zarpie is 10 years old and hops in puddles. Is it likely that this Zarpie hopped in puddles at 4 years old?

Please circle one: Yes, it is likely No, it is not likely

Is it likely that this Zarpie will hop in puddles as an adult?

Please circle one: Yes, it is likely No, it is not likely
Test Questionnaire for Picture Book (slide set) B

Please answer each of the questions below using only the information provided by the picture book you have just seen. You may take as much time as you need, but please try to answer with your initial instincts.

1. Remember the picture in the story of the Zarpie who sleeps standing up? Why does this Zarpie sleep standing up?

2. A Zarpie mom loves the smell of rotten vegetables. She gives birth to a baby, but she is not able to raise the baby. Someone from another village, who is not a Zarpie and loves the smell of wet dogs, volunteers to raise the baby. The baby is raised by the person from another village immediately from birth and never sees the Zarpie mom again. When the baby grows up, is it more likely to prefer the smell of rotten vegetables or wet dogs?

Please circle one: Rotten Vegetables Wet Dogs

3. If a Zarpie mom who sings very loudly gives birth to a baby that is raised by a non-Zarpie mom who sings very softly under the same circumstances as above, will the baby be more likely to grow up to sing loudly or softly?

Please circle one: Loudly Softly

4. If a Zarpie mom who has freckles gives birth to a baby that is raised by a non-Zarpie mom who does not have freckles under the same circumstances as above, will the baby grow up to have freckles?

Please circle one: Freckles No Freckles
5. In the story, one picture showed a Zarpie who gets sweaty even when it snows. There is another Zarpie named Y. Is it likely that Zarpie Y also gets sweaty when it snows?

Please circle one:  Yes, it is likely  
No, it is not likely

6. A Zarpie named X hates squishy things. Is it likely that Zarpie Y also hates squishy things?

Please circle one:  Yes, it is likely  
No, it is not likely

7. A Zarpie is 10 years old and is good at knocking over big trees. Is it likely that this Zarpie was good at knocking over big trees at 4 years old?

Please circle one:  Yes, it is likely  
No, it is not likely

Is it likely that this Zarpie will be good at knocking over big trees as an adult?

Please circle one:  Yes, it is likely  
No, it is not likely

8. A Zarpie is 10 years old and is a good dancer. Is it likely that this Zarpie was a good dancer at 4 years old?

Please circle one:  Yes, it is likely  
No, it is not likely

Is it likely that this Zarpie will be a good dancer as an adult?

Please circle one:  Yes, it is likely  
No, it is not likely