AN EXPERIMENTAL TEST OF THE CULTIVATION OF ENVIRONMENTAL ATTITUDES AND VALUES FROM ENVIRONMENTAL TELEVISION CONTENT

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Joseph Hanson

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Department of Communication Studies
Abstract

of

AN EXPERIMENTAL TEST OF THE CULTIVATION OF ENVIRONMENTAL ATTITUDES AND VALUES FROM ENVIRONMENTAL TELEVISION CONTENT

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Recent insights into cultivation theory (Shrum, 2004) support a case for the experimental test of the effect of television programming on viewers’ attitudes and values. An experiment manipulating the environmental content (high, low) of television programming was conducted to test the effect of environmental content in television programming on viewers’ attitudes and values regarding the environment. One hundred fifty-seven participants from a large western university participated in this study. Results indicate no relationship between type of content viewed and attitudes toward the environment. These outcomes are discussed in relation to current research.

Kimo Ah Yun, Ph.D.

Date
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Chapter 1

INTRODUCTION

Background

Data from various avenues of scientific endeavor are indicating a need for the rapid transformation of humanity's relationship with the environment (Butchart et al., 2010; Chapin, Matson, & Vitousek, 2011; Ehrlich & Pringle, 2008; Leadley et al., 2010; Millennium Ecosystem Assessment, 2005). For example, a recent Technical Series report (Leadley et al., 2010) from the Secretariat of the Convention on Biological Diversity expresses dire concern for the future of Earth's biodiversity should human development continue on its present course. Among a mosaic of bad news, this report projects that land use changes, exploitation of forests and marine resources, modification of river flow, fresh water pollution, rising atmospheric CO2 concentrations, and climate change will result in highly visible modifications to ecosystems such as tropical forests, pastures, croplands, boreal forests and marine life. Furthermore, they identify inevitable tipping points that will result in a loss of biodiversity great enough to exert catastrophic negative regional and global scale impacts on ecosystem services and human well-being. To say the least, environmental degradation poses a serious risk to global human activity and quality of life and this risk is exacerbated by the closely related violent conflict over increasingly scarce resources (Ehrlich & Pringle, 2008; Homer-Dixon, 1999; Kahl, 2006).
Some potential solutions have been proposed from independent scholars (Chapin et al., 2010; Ehrlich & Pringle, 2008) as well as internationally supported scholarly bodies (Leadley et al., 2010; Millennium Ecosystem Assessment, 2005). While grander solutions such as developing institutions to regulate interactions between markets and ecosystems (Millennium Ecosystem Assessment, 2005) require lengthy political deliberation and implementation, others such as involving local communities in conservation efforts are immediately attainable.

No matter the solution, however, the scholarly community is in agreement that global sustainability is unattainable without cultural reformation (Allenby, 2008; Ehrlich & Pringle, 2008; Leadley et al., 2010; Millennium Ecosystem Assessment, 2005; Reisch, 2008a; Steffen, Crutzen, & McNeill, 2007). Specifically, many in the scholarly community are concerned with the culture of consumption, the backbone of most industrialized and economically thriving nations (Reisch, 2008b) who are increasingly forced to dig deeper into the finite resources of the planet to support an unsustainable lifestyle (Gardner & Prugh, 2008).

Regarding cultures of consumption, it should come as no surprise that the United States ranks second on a global scale of the greatest contributors to environmental degradation (Bradshaw, Giam, & Sodhi, 2010). This statistic is further corroborated by measures indicating that over half of the economic activity in the United States is unsustainable (Talberth, 2008). Furthermore, recent interest in the environmental effects of *Anthropocene* (roughly translated as the *Age of the Human*) is testament to the veracity
of this dominant western culture (Steffen et al., 2007). Anthropocene describes the globalization of the culture of consumption in relation to the natural systems of the planet and historical cultural activity (Allenby, 2008; Steffen et al., 2007).

Though the United States is a major driver of the culture of consumption, the mentality spans many industrialized societies. Levels of materialism and conspicuous consumption are on the rise in China (Podoshen, Li, & Zhang, 2011). Ethnographic data indicate that consumption is an aspiration for European youth (Deutsch & Theodorou, 2010) and other analyses indicate that westernized consumers are led to adopt or aspire to a prevailing lifestyle of high-quality material possessions and of fast, short-term consumptive behaviors (Reisch, 2008a).

There is no doubt that a culture of consumption cannot prevail under the confines of finite resources. But that this issue is as much of a cultural phenomenon as anything else is a blessing as much as it is curse. Because culture is learned (Herskovits, 1948), it is subject to the process of learning.

To this end, communication research has taken a front seat in the debate over social reform (Oskamp, 2000). Education, peer involvement, social networks, interpersonal dialog and media consumption are all significant communication behaviors that contribute to an individual's attitudes, values and behavior regarding pro-environmentalism, sustainability and consumption (Hansen, 2011; Oskamp, 2000; Steg & Vleck, 2009). Given that values, attitudes and social roles are partially a function of enculturation and personal experience (Herskovits, 1948; Kottak, 1999), investigating the
extent to which tools of enculturation contribute to an individual's environmental values is an appropriate endeavor.

In order to conduct such an investigation this thesis begins with a discussion of enculturation, the grander social influence that directs individual experience. Following this are definitions of relevant individual differences that might influence attitudes and values regarding consumption and the natural environment. To accomplish this, Gerbner (1956, 1966) and Herskovits (1948) are consulted to begin defining the system of messages that constitute culture.

Enculturation

Culture is composed of a system of messages (Gerbner, 1966). Definitions of right and wrong, good and bad, true and false are passed from one generation to another via the world of symbols. This system of messages communicates what is real and normal and enculturates individuals to fit an established social order. Throughout their lifetime, individuals accumulate and incorporate this information into their understanding of the world around them (Herskovits, 1948).

Until the relatively recent rise of mass-communication mediums, the process of enculturation occurred mostly orally and within a small frame of reference. The geographic confines of this medium sustained heterogeneity across what are now more homogenized groups of individuals. Organized religion and formalized education eventually assumed some of the enculturation responsibility that was long dominated by family, friends and community members. This is not to say that family, friends and close
community members lost influence, only that they have come to share influence with more institutionalized objectives. The rise of these very centralized and specialized institutions is a powerful example of shifts in the enculturation process that can result in greater homogeneity between otherwise heterogeneous groups of individuals.

Most recently (relative to the timeline of human anthropology), the dominant enculturation institution has shifted from religion and formal education to mass-communications (Gerbner, 1966, 1967). This shift has not, however, decentralized the process of enculturation. Gerbner and Gross (1976) claim, “[t]he institutional processes of producing these message systems have become increasingly professionalized, industrialized, centralized and specialized” (p. 173). Morgan and Shanahan (1999) concur, “[t]oday, story-telling is in the hands of global commercial interests that in effect operate outside the reach of democratic decision” (p. 5). Thus, institutions, most currently those utilizing mass communication technology, are dominating the system of messages that establishes social order.

Clearly such power merits attention from researchers. Questions arise about how much, under what conditions, why and what influence these institutions have on culture. Such concerns seem almost axiomatic. Yet contrary to these concerns, most investigations into mass-communications share the tactical goal of finding “the most suitable ways of ‘selling’ (or disguising) policies which serve institutional objectives” (Gerbner, 1966, p. 100). That is, most investigations have been interested in immediate persuasive effects of singular mass media messages.
In response to this constrained method of investigation, a new method of analysis was developed which made the institutional objective the subject of investigation. This process was called Cultural Indicators, and was later developed into Cultivation Theory (Gerbner, 1966). The theory's founder, George Gerbner, argued that "decision-making in a democratic society required critical analysis of the nature and consequences of those [institutional] objectives" (as cited in Morgan & Shanahan, 2010, p. 338), and with this, turned the world of mass-communication research upside down.

Television as a Tool of Enculturation

Though a number of mass-communication mediums aggregate a system of messages, none have produced as pervasive or consistent of a system as television (Gerbner, 1967; Gerbner & Gross 1976). Consumption of television content is not restricted by age, wealth, or education, each of which has previously constricted access to story-telling mediums such as literature and theatre (Postman, 1985). Television, as Gerbner and Gross (1976) explain, "is likely to remain for a long time the chief source of repetitive and ritualized symbol systems cultivating the common consciousness of the most far-flung and heterogeneous mass publics in history" (p. 174). Such a claim is not unwarranted, given that over thirty years later 2010 data from Nielson (Nielson, 2011) indicate that television usage is still on the rise with an average viewer consuming nearly five hours of television per day. Given such repetitive and ritualized consumption of a system of messages, the same concerns mentioned previously arise again: What, if any,
effect does television consumption have on viewers' enculturation? Under what conditions does it persist? And possibly of greatest importance, how does it work?

Cultivation Theory

Ultimately, cultivation theory guides the analysis of television effects by means of Cultural Indicators (Gerbner, 1969). The term "indicator" is used in compliment to economic and social indicators so as to "provide a barometer of important cultural issues" (Morgan & Shanahan, 1999, p. 3). Cultural Indicators consists of a three-phased research process, which Morgan and Shanahan (1999) summarize in their review of the literature:

The first, *called institutional process analysis*, investigates the systemic pressures and constraints that affect how media messages are selected, produced and distributed. The second, called *message system analysis*, quantifies and tracks the most stable, pervasive and recurrent images in media content, in terms of the portrayal of violence, minorities, gender roles, occupations, and many other issues. The third, called *cultivation analysis*, explores the extent to which television viewing contributes to an audience members' conceptions about the real world. (p. 3)

Resulting from this analysis is a *cultivation differential*, which indicates the difference television consumption contributes to a particular attitude or belief.

It is important to distinguish "effects" as they are typically thought of in media effects research, and the "effects" that Cultural Indicators seeks to illuminate. Cultural indicators do not expose the immediate and short term behavioral and attitude change
effects of any particular program, advertisement or the like. Gerbner (1967) argues that television publishes a system of messages that consistently depicts what is, what is important, what is right, and what is related to what else. These conclusions are a result of his institutional process analysis, the first step in cultural indicators research. Through message system analysis the message systems disseminating cultural information are exposed and their "effect" on the public measured through cultivation analysis. Thus, cultivation is not concerned with any particular instance of television that impacts an individual; it is concerned with the culmination of an individual's consumption of the system of messages into a culminating worldview.

According to Gerbner (1966), the message system of television is arguably a more applicable unit of analysis in media effects research than immediate behavioral and attitude effects. Immediate effects, derived under a conventional research paradigm, utilize experiments and identify change as the most significant outcome to be measured. As stated earlier, the goal of much of this type of analysis is tactical: researchers attempt to devise the most effective ways of persuading individual consumers.

In contrast, Gerbner argued that television is a medium advancing the status quo, the result of which is stability and homogenization, not change. Television preserves the status quo via a system of messages, not any particular instance of message consumption. Experimental research fails to elucidate this greater effect of television. Comparison between groups in order to measure change becomes nearly impossible as unexposed and exposed individuals are not identical in all important aspects of comparison. Measuring
effects based on the culminating experience of television throughout a lifetime, as opposed to a controlled single exposure, prevents adequate management of extemporaneous variables.

Consequently, in order to investigate the culminating experience of television, the research paradigm must be flipped (Gerbner & Gross, 1976). As Gerbner and Gross (1976) state, "[w]e cannot look for change as the most significant accomplishment of the chief arm of established culture if its main social function is to maintain, reinforce and exploit rather than to undermine or alter conventional conceptions, beliefs and behaviors" (p. 9). Accordingly, the system of messages disseminating institutional objectives becomes the focus of analysis.

It is important to note that cultivation theory does not presume that immediate behavioral and attitude change effects do not exist, or that they are not important. It merely exposes an area of media "effects" previously unconsidered: the enculturation of individuals into a homogenized public. Without a doubt, a shared understanding of what is normal and right effects the functioning of a society. Self-governance across great distance and otherwise heterogeneous groups is impossible without common symbols and understanding. Television facilitates the homogenization of these otherwise distinct groups of individuals.

At face value, this seems a harmless consequence. If television disseminates a system of messages consistent with real occurrences, analysis of the effects of the system of messages would produce nil. However, as exposed by message system analysis, the
information disseminated by television’s stories is not always consistent with reality and the effect of this discrepancy is mal-homogenization. Cultivation analysis provides a tool for measuring mal-homogenization. For example, seminal research showed that nearly 66% of network television characters were involved in violence each week. In contrast, census data indicated that 0.32% of U.S. citizens were violently victimized in the year 1970 (as cited in Gerbner & Gross, 1976). This is clearly a substantial difference that, as claimed, could generate unwarranted fears and paranoid delusions (Gerbner & Gross, 1976). In fact, Gerbner and Gross's (1976) first cultivation analysis indicated that heavy consumers of television, more than light, were likely to demonstrate a fear of being victimized.

Since the inception of Cultural Indicators and the seminal research guided by Cultivation Theory, over 500 studies have been published regarding cultivation. In the last ten years alone, 125 have been published (Morgan & Shanahan, 2010). For over three decades Cultivation Theory has been developed, tested, criticized, reassessed, ratified and expanded. One such development has resulted in support for a causal link between television and attitudes.

**Correlation vs. Causation**

Historically, cultivation analysis has relied solely upon correlation data for support. As stated previously, the pervasive and processional nature of the system of messages makes it impossible to adequately control for extemporaneous variables between, or even within, experiment participants. Cultivation analysis is so reliant upon
correlation data that Morgan and Shanahan (1999) rejected experimental design
cultivation analyses from their meta-analysis of cultivation research on the grounds that
experimental design does not fall within the power of cultivation analysis and should not
be considered support for the theory.

More recently, distinctions have been drawn between various degrees of
cultivation (Hawkins & Pengree, 1982; Potter, 1991b; Shrum, 2002, 2004) resulting in
first and second-order judgments. Those judgments measured via correlation data, first-
order judgments, concern prevalence and likelihood estimations. For example, seminal
cultivation research asked participants to estimate the proportion of people employed in
law enforcement (Gerbner & Gross, 1976). Sure enough, heavy viewers, more than light,
estimated a higher proportion of law enforcement agents. Later discoveries exposed first-
order judgments to be memory based (Shrum, 2004) and consequently, they remain
reliant upon correlation data, due mainly to the confines of cultivation analysis and due
partially to the nature of memory access.

Second-order judgments, on the other hand, concern the attitudes and values of
viewers. In this case, participants are asked for their agreement with attitude and value
statements such as, "it is important to carry some form of protection when out at night" or
"violence can solve certain problems." Second-order judgments have recently been
exposed to be "online" judgments, meaning that information is incorporated into the
knowledge structure during viewing (Shrum, 2004). This research is seemingly in
striking contrast to the original cultivation propositions that the culminating experience of
television is what results in cultivation. However, Shrum (2004) suggests that cultivation of attitudes and values can in fact occur during viewing. It is entirely possible that the cultivation of attitudes is a function of both online viewing and the culminating experience of viewing (Shrum, 2004), indicating that the two processes run parallel. This distinction and concurrent explanation has been dubbed the cognitive process model of cultivation (Shrum, 2002) and has important implications for the future of cultivation research.

The first important implication of the cognitive process model of cultivation is that it provides for a more rigorous test of the causality assumption of cultivation theory. Because of the correlational nature of previous cultivation studies, it has not been possible to establish an unambiguous causal relationship between television viewing and viewers' first or second-order judgments. It has been routinely asserted (Doob & Macdonald, 1979; Hawkins & Pingree, 1982; Potter, 1991b), that certain demographic and/or individual trait variables account for the difference in judgments that occurs between heavy and light viewers. For example, it was demonstrated that when accounting for education level, the cultivation effect disappears (Gerbner, Gross, Morgan, & Signorielli, 1980a) indicating that a presumed cultivation effect could actually have been a function of less educated individuals being prone to heavier viewing. That second-order judgments are formed online makes possible experimental analysis of the conditions under which second-order judgments are formed. Experimental analysis results in
stronger support for the previously presumed causal relationship between television viewing and attitude formation.

Second, a cognitive process model of cultivation provides for the identification of moderating and mediating variables that may augment or inhibit the cultivation effect. Television viewing can be thought of as a form of message encoding. If television exerts influence at the time of viewing, then factors that facilitate or inhibit message encoding should also facilitate or inhibit the cultivation effect (Shrum, Burroughs, & Rindfleisch, 2005). For example, narrative involvement was recently discovered to facilitate the cultivation of materialistic attitudes and values (Shrum, Lee, Burroughs, & Rindfleisch, 2011) such that viewers who are more involved in the narrative of a television show exhibited greater cultivation effects (higher degree of materialism) than those less involved.

Few studies have attempted to test these recent propositions of the cognitive process model of cultivation, and those that have are part of a series of studies from the founding group of authors (Shrum, 1995, 1999, 2001; Shrum et al., 2005; Shrum et al., 2011). There is a pressing need to devote further attention to this most recent body of cultivation research. Additionally, the need for investigating tools of enculturation as they relate to a culture of consumption is pressing as well. As such, this thesis experimentally tests the impact of viewing various program types on viewers’ attitudes and values regarding the natural environment. Such an analysis will make unique contributions to
the current body of cultivation research as well as the body of research on sustainable living.

This thesis extends the research conducted by Shrum and colleagues (Shrum, 2004; Shrum et al., 2011), by introducing new topics on which to measure television's influence of viewers' attitudes: sustainability, consumption and pro-environmentalism. As stated previously, humanity's relationship with the natural environment is in dire need of rapid change. If television has the potential to impact how viewers interact with the natural environment then this thesis will contribute to the understanding of how television's impact occurs. Such definition would prove valuable in social reform campaigns as well as other outlets of political intervention.

This thesis also tests Shrum's (1999, 2004) claim that second-order judgments are made "online," or at the time of viewing. Only two other studies have tested this proposition (Shrum et al., 2005; Shrum et al., 2011), resulting in a lack of external validity. As the model has been tested less than a handful of times and by few researchers, this thesis contributes to the external validity of the cognitive process model of cultivation.

To accomplish the goals of this thesis a thorough review of the literature is iterated to foster an understanding of the principles guiding the research agenda. Subsequently, these principles construct a sound rational that supports hypotheses offered. Following experimentation, necessary conclusions resulting from the data are integrated into the current body of research. Finally, study limitations and
recommendations for future research are offered. What follows is the first step of this process: the literature review.
Chapter 2

LITERATURE REVIEW

Cultivation is the process of meaning-making wherein individuals are enculturated into a public by means of the dominant story telling agents of the era (Gerbner, 1958, 1967). Five core concepts of this definition – (a) process, (b) meaning-making, (c) enculturation, (d) public and (e) story telling agent – require greater explanation to foster a comprehensive understanding of Cultivation Theory before proceeding into a discussion of more recent developments. Those concepts are defined below and described in relation to cultivation.

Process

Cultivation is a process, meaning that it is ongoing and dynamic; it begins at birth and continues until death. No particular contribution exerts influence independent of the contributions that precede and follow it. The process of cultivation consists of an individual continuously making meaning out of experiences. Accordingly, the focus of the next elucidation is the construct of meaning-making, which has been assiduously defined by Kegan (1982).

Meaning-making

Meaning-making is fundamental to human being, so much so that "there is no feeling, no experience, no thought, no perception, independent of a meaning-making context in which it becomes a feeling, an experience, a thought, a perception, because we are the meaning-making context" (Kegan, 1982, p. 11). Congruent with this definition is
Kurzman's (2008) assertion that meaning-making is a goal in itself as humans seek to understand the world around them. Kurzman defines meaning as "moral understandings of right and wrong, cognitive understandings of true and false, perceptual understandings of like and unlike, social understandings of identity and difference... and any other understanding that we may chose to identify through... meaning-making." This formulation of meaning-making is consistent with Gerbner's (1967) explanation of the system of messages that constitutes culture in the world of symbols. Accordingly defined here, meaning-making is the act of being human, where human being is the ability to define experience, organize experience and make corresponding judgments. Defined in this way, meaning-making is foundational to an individual's conception of reality, it is a continuous process, and indivisible from enculturation, the third aspect of cultivation requiring illumination.

Enculturation

First described by Herskovits (1948), enculturation is the process of conscious or unconscious conditioning in which an individual achieves competence in his or her culture. Through culture, people grasp and apply specific systems of symbolic meaning which they gradually internalize and use to define their world, express feelings, and make judgments (Grusec & Hastings, 2007). This system continues to guide their behavior and perceptions as they age. The individual acquires appropriate values and behaviors by learning what their culture deems to be necessary (Kottak, 1999). Enculturation includes influence from vertical (parental), horizontal (peers) and oblique (networks and social
institutions) sources. Each of these sources can limit, shape and direct the developing individual. Although in the early stages of life enculturation is the mechanism ensuring cultural stability, operative on more mature individuals the process is important to inducing change.

The relationship between meaning-making and enculturation is almost needless of explication. To be sure, however, enculturation is unattainable without meaning-making. By definition, enculturation requires an individual make sense of cultural symbols. At early ages, individuals construct meaning with the help of their cultural influences. At later ages, individuals use their established cultural system to interpret and organize new meanings. Regardless of age, enculturation is indivisible from an individual's process of meaning-making, and is clearly a process itself, implying continuous systemic influence.

Public

The fourth term requiring explanation is Gerbner's (1967) conception of a "public." In order to define "public" an explanation what Gerbner (1967) describes as "publication," is necessary. When there exists the potential for private perspectives to be broadcast publicly (as their exists with mass-communication) the process by which private knowledge is transformed into public knowledge is the process of publication. In this process personal ways of selecting and viewing events and aspects of life are transformed into broad public perspectives between groups of individuals who might have otherwise not shared a perspective. The utility of publication is the ability to
facilitate self-governance among a population too numerous and dispersed to interact in a personally mediated fashion. Gerbner (1967) states:

> publication is the formation and information of publics; the creation and cultivation of public perspectives; the ordering and weighting of shared knowledge; the maintenance through mass-produced message systems of vast and otherwise heterogeneous communities of perspective and meaning among people who could interact no other way. (p. 436)

Accordingly, a public is the result of publication. When distinct and heterogeneous groups consume mass-produced messages derived from private perspective, a public, which is otherwise heterogeneous groups of individuals incapable of unmediated communication and (likely) shared perspective, is cultivated into a homogenous group of individuals sharing perspectives derived from private knowledge that was disseminated en masse. Modern mass-communication embodies this public-making ability and forms "historically new bases for collective thought and action quickly, continuously and pervasively across all previous boundaries of time, space and even culture" (Gerbner, 1967, p. 436). Publication provides the common currencies of social interaction and defines public perspectives. It cultivates the most broadly shared notions of what is, what is important, what is right and what is related to what else.

**Story-telling Agent**

In the United States, television has been the dominant focus of cultivation analysis as television is "the most pervasive cultural institution and most visible
disseminator of cultural symbols" (Morgan & Shanahan, 1999, p. 3). Television, claimed
Gerbner (1967), is a mass medium that disseminates socio-cultural information and
enculturates individuals into a public. It does so as a story-telling agent telling the story
of the established social order. No particular moment in television creates change in an
individual, Gerbner argued. In contrast, the accumulation of the socio-cultural story that
television tells throughout a consumer's life is how it exerts influence.

In conclusion, an individual is cultivated by television as they make meaning out
of the socio-cultural information it presents via stories. The meanings created contribute
to the consumer's enculturation. The resulting body of enculturated individuals is a
public. Accordingly, cultivation theory posits that viewers who consume more television
are enculturated in greater consistency with the television story, which differs
significantly from reality.

The Cultivation Proposition

Testing the cultivation proposition required discarding what is typically
considered the most powerful form of scientific investigation: the experiment. The
experiment, Gerbner and Gross (1976) claimed, is a method of analysis that monitors
immediate change after exposure to an artifact. Experimental analysis fails to expose
change in attitude and behavior resulting from an accumulation of the system of
messages published by television. The "effect" of television that should be of concern to
researchers, according to Gerbner (1967), is not so immediate. Instead, to expose this
effect researchers must be able to show that the accumulation of television consumption
produces distinct differences between individuals who consume more and less television. Consequently, it was argued that correlation data is required for cultivation analysis, such that amount of television viewing is correlated with an individual's likelihood of holding conceptions of reality closer to that depicted by television's stories.

With the publication of the first Violence Profile, in 1976 (Gerbner & Gross, 1976), the world saw its first cultivation analysis. The study showed that heavy viewers were more likely than light viewers to give the "television answer" to survey questions about law enforcement, trust, and danger. To achieve these results the authors conducted an analysis guided by the Cultural Indicators research program mentioned previously. Years of research prior to the cultivation analysis exposed details of the message system published by television (Gerbner & Gross, 1976). Using this data, Gerbner and Gross created forced choice questions for which one response, deemed the "TV answer," reflected the world of television, and the alternative response reflected reality. Results confirmed the hypotheses: heavy viewers were more likely than light to choose the television answer for questions about law enforcement, trust and a sense of danger. For example, 1970 U.S. census data showed that four out of every one thousand people worked in some sort of protective services profession. Yet when asked to estimate whether the percentage of people in law enforcements was closer to 5% (the television answer), or 1% (the reality answer), 59% of heavy viewers, as compared to 50% of light viewers agreed that the percentage of individuals in law enforcement was 5%: the "TV
answer." This 9% difference was significant, and confirmed that television consumption does influence an individual's conception of social reality.

It goes without saying that controls must be applied to such an analysis if the resulting cultivation differentials are to be received with any degree of conclusiveness. Gerbner admits that "[t]he obvious objection arises that light and heavy viewers are different prior to -- and aside from -- television. Factors other than television may account for the difference" (Gerbner & Gross, 1976, p. 191). Accordingly, Gerbner and Gross applied a number of standard and specialized controls to their analysis, namely, education level, occupational prestige, income, age, sex, race, other media use. Some of these controls, education level for instance, modified the resulting cultivation differential. Upsetting the uncontrolled relationship, respondents with some college education were less likely to choose the television answer than those who have had none, regardless of viewing time. Gerbner and Gross' response was to look for cultivation effects within each group. Doing so, they found significant trends replicating the uncontrolled analysis. For example, within education levels, heavy viewers were more likely than light to chose the television answer. As Morgan and Shanahan (1999) summarize, "the baselines of the dependent variables were higher or lower in different subgroups, and some groups showed weaker or stronger associations, but the same general patterns persisted" (p. 8).

Under controls, the same general patterns of cultivation remained present and these patterns "were soon to unleash a veritable firestorm of criticism, controversy, and confusion" (Morgan & Shanahan, 1999, p. 9). Subsequent analyses corroborated the
results of the first publication (see for example: Gerbner, et al., 1977; Gerbner, Gross, Jackson-Beeck, Jeffries-Fox, & Signorielli, 1978), but as Morgan and Shanahan write in their reflection on the first twenty years of cultivation analysis, "[e]very aspect of measurement, coding, sampling, controls, question wording, scaling, and more was to come under intense scrutiny... we can see now that this is as much a political phenomenon as anything else" (p. 9). Morgan and Shanahan are likely correct in their assumption of the political role such research could play.

Gerbner's proposition was that individuals with power in society control the production and distribution of cultural stories, and that these stories promote specific patterns of power. When the question of media "effects" became concerned with the unequal distribution of resources, opportunities and securities, the debate became forever politicized. The proposition struck the sensitive strings of a vast body of professionals, scholars and politicians. From all directions, nearly every aspect of Cultivation Theory was attacked.

*The Selective Viewing Critique*

A number of critiques against Cultivation Theory have been formulated, some of which led to needed refinements and specifications. The first such critique came from Newcomb (1978), who claimed, on humanistic grounds, that cultivation analysis disregards selective exposure and individual interpretation. Newcomb contended that mass media are sites where hegemonic meanings are enacted, negotiated, resisted, or opposed. Constructs such as violence may have many symbolic meanings and all viewers
do not interpret acts of violence in the same way. He defended qualitative analysis and
promoted in-depth investigation of individual programs instead of the sum pattern of all
television programming. As Morgan and Shanahan (1999) note, "he questioned whether
viewers would 'get' the message that Gerbner and Gross (1976) claimed they should from
exposure to television violence."

Though formulated as a critique against cultivation analysis, there is nothing in
Newcomb's proposition that contradicts the basic tenets of cultivation theory (Morgan &
Shanahan, 1999). Surely there are differences between programs, contexts and viewers,
but to focus only on those is to disregard any potential similarities that might also exist in
the greater system of messages. Seminal cultivation theorists were careful not to "deny
that programs differ, that viewing can be selective, that variations in channels and genres
exist, or that any of these are not important" (Morgan & Shanahan, 1999, p. 20). Instead,
they maintained that these are separate issues which cultivation analysis does not seek to
alleviate. Newcomb's case fallaciously affirmed a disjunct, when in fact television
programming need not contain one or the other different or consistent messages, but may
contain both. Gerbner and Gross (1979) argued that television programming was more
like formulaic, market-driven, assembly-line production than individual works of art,
though such programs do exist. Additional refutation of Newcomb's critique pointed to
the body of cultivation research as evidence of the consistent system of messages, and
dismissed the small effect sizes as evidence of what Newcomb considered "humanistic"
differences in viewing.
The lessons learned from this critique strengthened the resolve of cultivation theorists determined to expose the consistent system of messages. The distinction between analysis of individual differences and a general system was made clearer, and the purpose of cultivation analysis persisted. Recent research has expanded cultivation analysis to include slightly more specific measures of the message system (Morgan & Shanahan, 2010). The use of genre-specific viewing measures is still a point of minimal contention in cultivation research, though two meta-analyses indicate that it may produce a more specific measure of cultivation (Dossche & Van den Bulck, 2010; Morgan & Shanahan, 1999).

Accepting the Null

A second notable critique came from Wober (1978), the result of which also served to strengthen the Cultivation Theory. Wober failed to demonstrate support for the cultivation hypothesis, claiming that there is "no evidence for a paranoid effect of television on British viewers" (p. 320). Wober as well cited a concurrent study that failed to replicate the results of Gerbner's first studies (Piepe, Crouch, & Emerson, 1977). Refuters claim that Wober's study diverges from proposed cultivation analysis in important ways (Morgan & Shanahan, 1999). First, a subsequent analysis years later reveals that the controls of British television ensure a more diverse and balanced flow of media messages that are not driven entirely by commercial interests (Wober & Gunter, 1988). Respectively, there is less violence in British television, and U. S. programming only constituted about 15% of British screen time. Cultivation predicts that a system of
messages that includes less violent constructs should produce less fear and mistrust. That being the case, Wober's (1978) study actually supports cultivation theory.

Additionally, and perhaps more importantly, Wober's study procedure may have contaminated results. His study was framed and presented to participants as an examination of "attitudes to broadcasting." More recent research has indicated that priming source consideration before observation nullifies any indication of cultivation (Shrum, 2002, 2009; Shrum, Wyer, & O'Guinn, 1998). Consequently Wober's results can be discarded as a function of his sample population and methodological procedures.

Spuriousness

A more substantial critique that led to the development of the resonance refinement to Cultivation Theory was offered by Doob and Macdonald (1979). These authors tested whether cultivation was an artifact of some spurious variable, in this case, the participant's neighborhood. They reasoned that people who live in areas of higher crime tend to have a greater "mean world" expectation due to their location and thus spend more time indoors watching television. By sampling four areas of metropolitan Toronto (high crime-city, high crime-suburb, low crime-city, low crime-suburb) they tested if the relationship between television viewing and perceptions of violence were curtailed by the spurious variable of location.

Before differentiating between groups, their results were consistent with typical cultivation analyses, demonstrating a moderate relationship of $r = .18$ between viewing and fear of crime. However, once partitioned, correlations between groups varied
drastically, and remained consistent with the authors' hypotheses. Those people in high
crime areas showed a greater relationship between television viewing and fear of crime.
This was interpreted to mean that people in high-crime neighborhoods have a greater fear
of being outside their homes, so they watch more tv than those in low crime areas.
Accordingly, those in low crime areas exhibited a much smaller relationship. Doob and
Macdonald averaged the effect sizes across groups and concluded that with such an
insignificant effect size \( r = .09 \), "there is essentially no relationship between media
usage and fear of crime when the effect of neighborhood is removed" (p. 173).

A number of issues peril Doob and Macdonald's conclusions. Similar to the
confounds of Wober's (1976) study, Doob and Macdonald's television viewing measure
preceded others in their interview, resulting in potentially contaminated results due to
priming (Shrum, Wyer, & O'Guinn, 1994). Second, Doob and MacDonald's study was
conducted in Toronto. As mentioned previously, foreign media systems may exhibit stark
differences when compared to U. S. media and, at the time, little data existed indicating
that cultivation should occur in Doob and MacDonald's sample population (Wober &
Gunter, 1988).

Finally, as Morgan and Shanahan (1999) observantly note, an average of the four
correlations does not result in a partial correlation with the effects of neighborhood
removed. "These data do not show a 'spurious' association; if they did, the relationship
would be essentially zero in all four areas. Instead, they show a specification" (Morgan &
Shanahan, 1999, p. 13). The relationship between viewing and fear is magnified by the participant's location.

To account for these new findings, Gerbner, Gross, Morgan, and Signorielli (1980a) contend that television’s message about violence may be congruent, and consequently "resonate," with the everyday experiences of viewers. Later research both corroborates this assumption and offers an explanation as to why it occurs (Bradley, 2007; Shrum, 2002, 2009; Shrum & O'Guinn, 1997; Shrum et al., 1998; Shrum et al., 2005). Though I elaborate later, resonance is essentially a function of memory access, where constructs (such as crime) in memory are activated to the degree that they are related to each other. For example, heavy viewers more than light, in high-crime areas, accumulate a greater store of "crime" memories, including televised portrayals, and are expected to exhibit a greater fear of crime due to the greater accumulation of total "crime" memories.

Multiple Controls

Another critique that resulted in the refinement of Cultivation Theory was offered by Hughes (1980) and Hirsch (1980, 1981) who re-analyzed the data used in Gerbner et al.'s Violence Profile 8 (1977) and 9 (1978). These authors claim that under multiple controls, the cultivation effect disappears. Gerbner and colleagues typically examined cultivation within subgroups one at a time. That is, they would separate and examine cultivation for men and women, educated and non-educated, older people and younger people. These re-analyses claimed that it was insufficient to apply controls one at a time
as it could be that individual controls only explain a small portion of the apparent relationship. Accordingly, when applied all together, the cultivation effect disappears. Researchers used this data to conclude that cultivation is an artifact of covariation.

Rebuttals came from Gerbner and others (Gerbner et al., 1980a, 1980b, 1981a, 1981b, 1981c, 1982; Hawkins & Pingree, 1982) who claimed an "obfuscation" of potential effects within subgroups. If an overall relationship disappears under multiple controls, it does not follow that there are no nonspurious and theoretically meaningful associations within specific subgroups. Gerbner and colleagues noticed particular patterns that emerged in the cultivation associations across subgroups such that the relationship held for the subgroup that "otherwise" was least likely to give the television answer. That is, differences between heavy and light viewers within subgroups that accounted for cultivation under multiple controls showed heavy viewers drifting towards television's system of messages. The refinement of mainstreaming was proposed to account for this new data.

Mainstreaming explains homogeneity among otherwise differing groups. The "mainstream" Gerbner et al. (1980a) refers to can be "thought of as a relative commonality of outlooks that television tends to cultivate" (p. 15). In some cases, Gerbner et al. claimed there should only be evidence for cultivation within groups who are out of the mainstream. For example, if more educated higher income groups have a more diversified pattern of cultural opportunities and activities, greater television viewing should pull them back towards the mainstream message system. This in fact is the case as
Gerbner et al.'s Violence Profile No. 11 (1980a) first indicated. Light viewers in high education and income groups show very little cultivation, but heavy viewers across social status boundaries were consistently cultivated toward the mainstream. Note that mainstreaming is consistent with the view of cultivation as a gravitational rather than unidirectional process. "The angle and direction of the 'pull' depends on the location of groups of viewers and their lifestyles with reference to the center of gravity, the 'mainstream' of the world of television" (Morgan & Shanahan, 1999, p. 17).

Though it is difficult to predict where and when mainstreaming will occur (Cook, Kendzierski, & Thomas, 1983), the effect has been replicated in various studies including assessments of political attitudes (Morgan & Shanahan, 1991), acceptance of authoritarian values (Shanahan, 1998), perceptions of affluence (O'Guinn, Faber, Curias, & Schmitt, 1989) and other issues such as sex role stereotypes, interpersonal mistrust and health (Gerbner, Gross, Morgan, & Signorielli, 1994). Ultimately the refinement strengthens the theory and offers greater explanatory power.

The Linearity Assumption

A final critique requiring elaboration attacks the monotonic linearity assumption of seminal cultivation research. According to cultivation theory the more television an individual watches the more they cultivate a social reality informed by the television message. To test this assumption, Potter (1991a) divided the viewing frequency of 308 adolescent participants into three different viewing distributions: a three-way split, quintile, and stanine. He regressed distributions on demographic variables and various
transformations of the television viewing measure. Results indicated various magnitudes of association within each distribution, some of which were non-linear. This, he claimed, is evidence for nonlinearity, which contradicts the basic premise of Cultivation Theory: that greater viewing produces greater cultivation. Similar results were observed in previous critiques (Hirsch, 1981; Hughes, 1980) that also claimed to show nonlinear relationships under multiple controls.

In defense of the theory, Morgan and Shanahan (1999) criticize Potter's measure of television exposure, claiming that asking adolescents how many hours a week they watch programs of different genres is a demanding task. Furthermore, they assert, such measure produces unreliable distributions:

Variations in question wording, response options, and the ages of persons in the sample all produce different distributions and mean that the numbers of actual hours reported are not relevant. That is why Gerbner et al. have consistently divided the sample into three groups of roughly equal size regardless of the actual cutoff points....The key conceptual problem with Potter's argument (and, in some ways, Hirsch's) stems from trying to read a level of precision into the viewing measures that cannot possibly be sustained. (Morgan & Shanahan, 1999, p. 19)

Because Potter assumes specificity in viewing measures that cannot be attained with current measurement techniques his results may not accurately capture the cultivation effect. Furthermore, cultivation analysis is concerned with general patterns, which were still apparent in Potter's analysis. The specificity of Potter's measures and
distributions beyond what cultivation analysis accounts for may have confounded the
analysis he was conducting. Morgan and Shanahan (1999) assert, "[w]e want to know if
it's warm or cold, not if it's 68 degrees or 69 degrees."

The critiques elaborated above, among others, have been articulated and rebutted
for over three decades (Morgan & Shanahan, 2010). Those discussed here serve the
purpose of specifying aspects of cultivation analysis that required and subsequently
benefited from refinement. Others not yet mentioned, such as contention over the
operationalization of viewing frequency measures raised by Fox and Philliber (1978)
have been settled empirically and rhetorically elsewhere (see Dossche & Van den Bulck,
2010; Morgan & Shanahan, 1999, 2010). The section that follows is an elaborate
discussion of the various forms of cultivation resulting from two other, quite sympathetic,

Forms of Cultivation

Originally formulated under the pretense of prevalence judgments (for example,
of the amount of violent crime in occurrence, the likelihood of being victimized, or the
number of employed law enforcement agents) Cultivation Theory was later expanded to
include attitude, belief, and value judgments. Upon the introduction of a second
cultivation measure the former measures were labeled first-order judgments and the latter
labeled second-order judgments (Hawkins & Pingree, 1982; Potter, 1991b; Shrum, 2002,
2004). This came as no surprise, as Gerbner, Gross, Morgan, and Signorielli (1986) stated
that the prevalence measures used in their cultivation studies are not the only measures of interest to cultivation theorists:

[O]ur investigation of the cultivation process is not limited to the lessons of television facts compared to real-world statistics. Some of the most interesting and important topics and issues for cultivation analysis involve the symbolic transformation of message system data into hypotheses about more general issues and assumptions (p. 28)

First-order judgments typically consist of forced-choice or percentage estimates of prevalence dependent on the subject of investigation, whereas second-order judgments typically consist of Likert-type items asking for a participant's agreement with attitudinal statements. Judgments of the first type are considered to indicate participants' cognitive worldview distortion (Dossche & Van den Bulck, 2010). For example, heavy viewers overestimate the amount of crime occurring in reality because of the frequency of crime stories on television (Gerbner & Gross, 1976). These judgments become "the basis for a broader world view" (first-order judgments) where this view is defined in terms of second-order measures such as "general values, ideologies, and perspectives as well as specific assumptions, beliefs and images" (Gerbner, Gross, Signorielli, Morgan, & Jackson-Beeck, 1979, p. 180). For example, an individual may misjudge the prevalence of law enforcement agents due to the over representation of such individuals on television.
Forming first-order judgments is not necessary for the formation of second-order judgments, nor do second-order judgments always form because of first. Television is not the only source of worldview and attitude development and the relationship between first and second order judgments is the manifestation of this premise. Clearly multiple sources of information exert influence on both first and second-order judgments.

The relationship between first and second-order judgments was first elucidated by Hawkins, Pingree, and Adler (1987) and Potter (1991b). These authors argued that the two measures indicate separate processes and "break down the general process of cultivation into the sub-processes of learning and construction" (Potter, 1991b, p. 94). In this case, learning is the relationship between amount of viewing and a cognitive worldview, where greater consumption leads to learning more incidental information. Shrum (1999) would later call this incorporating information into the knowledge structure. Viewers use this incidental information to construct and form beliefs about social reality.

Results from tests of this relationship are mixed. Hawkins et al. (1987) concluded that no symmetrical relationship exists between first and second-order judgments, meaning that second-order judgments are not formed based on first. Contrary to this, Potter (1991b) tested for an asymmetrical relationship, and found mild support. Combining results from each analysis it became clear that first and second-order judgments do tend to influence each other, though the degree of influence is contingent upon external factors such as age, neighborhood, and employment status. Some
individuals may hold a strong attitude and fit facts of life into that construct, whereas others might hold a weaker attitude, and thus make an attitude judgment based on the "facts."

The debate about the relationship between first and second-order judgments has not been settled, but it can be concluded that each is a distinct operationalization of the cultivation effect (Potter, 1991b). Subsequent research has corroborated this distinctiveness (see Shrum, 2002, 2004) whilst simultaneously producing an explanation of the process of cultivation. This and other explanations are the next focus of this thesis and form the basis of a rational for hypotheses.

The Cultivation Process

As stated by Shrum (2009), "[o]ne of the useful features of a process explanations [of cultivation] is that models are developed that specify both moderating and mediating variables" (p. 51). This is especially pertinent to the process of cultivation given the relatively low effect sizes generated by research (Dossche & Van den Bulck, 2010; Morgan & Shanahan, 1999). Small main effects may be obscured by unidentified moderators, such as messages having different effects on different groups or as a function of different situations. Furthermore, researchers have focused on direct effects at the expense of exposing indirect ones. Just as well, unidentified mediators may also salvage small main effects (McGuire, 1986). A process model exposes both of these while also identifying boundary conditions that specify under what conditions an effect does not hold. Recall from the introduction that this was proposed to be a main concern for future
cultivation research. Given the advantages of producing such a model, Shrum (2004) generated an extensive processing model of the cultivation effect that includes both first and second-order effects.

Shrum's (2004) case was founded in social cognition research, particularly the heuristic processing model (Chaiken, 1987; Chaiken, Liberman, & Eagly, 1989; Tverksy & Kahneman, 1973). Two principles direct this model. The first (heuristic/sufficiency principle) concerns what information is retrieved in the course of constructing a judgment. Specifically, this principle states that people do not search their memory for all information that is relevant to a judgment they are making but instead retrieve small subsets of available information and only the information "sufficient" to form the judgment is retrieved. The determinants of sufficiency are such factors as motivation and ability to process information. In contrast, systematic processing searches and retrieves all relevant data from memory stores to inform a judgment (Chaiken et al., 1989).

The second principle, accessibility, states that of the small subset of information retrieved to inform a heuristic judgment, the information which is most readily retrieved is most likely to be used in judgment formation. Many factors influence the ease with which information can be retrieved. Specific to the process of cultivation are the (a) frequency of construct activation, (b) recency of construct activation, (c) vividness of a construct and (d) relations with accessible constructs (Shrum, 2009).

Frequently activated constructs tend to be more easily recalled and, if activated frequently enough, particular constructs may become chronically accessible and are
spontaneously activated under many different situations (Chaiken et al., 1989; Higgins, 1996). For instance, an individual who frequently views the Star Wars films might recall bits of information or stories from the films and apply them to real situations where they might otherwise seem inapplicable. When a friend asks the individual to describe her experience of a recent roller coaster ride, the Star Wars lover's first response is to describe it in terms of fictional space travel. Recency of activation exhibits the same general tendencies as frequency. More recently activated constructs are easier to recall.

As the foundational hypothesis of Cultivation Theory is that frequency of television consumption influences viewers' beliefs, these two dimensions of information accessibility are directly relevant. Heavy viewers, compared to light, more frequently activate constructs consistently portrayed on television, especially if the viewer has more television experience than real experience with the construct. Furthermore, accessibility is enhanced in heavy viewers who, by definition, have a greater chance of having recently viewed.

A third factor that contributes to ease of recall is the vividness of constructs. More vivid constructs are more easily activated than less vivid constructs. Given the formulaic drama-enhancing goal of television, it is likely that many television portrayals would produce vivid memories for viewers, especially those who have little or no experience with the portrayed event. For instance, few individuals have courtroom experience, yet many television programs portray dramatized court sessions. News broadcasts provide an ideal example of this. According to a review by Zillmann (2002), news reports often
publish information in the form of case studies or extreme examples. To quote Shrum (2009), "Such a bias in favor of vivid examples over precise but pallid statistical information may make those examples relatively easy to remember" (p. 53).

The final dimension of accessibility worth noting presently is the degree to which relationships between accessible constructs influences information accessibility. Shrum (2009) summarizes: "Constructs are stored in memory in the form of nodes, and links are formed between the nodes. When a particular node (stored construct) is activated, other constructs will also be activated to the extent that they are related to that node."

Gerbner's first violence profiles (Gerbner, 1972) and other analyses that followed (e.g. O'Guinn & Shrum, 1997) have exposed the consistent and formulaic portrayal of constructs such as violence and affluence on television. Individuals can build scripts or situation models that include information from this programming and consequently (all other life experiences the same) we would expect heavy viewers, more than light, to more readily access concepts. Due to added links between nodes that have been informed by television portrayals, accessibility increases.

Frequency of activation, recency of activation, vividness of a construct and relations with accessible constructs all determine the accessibility of information in judgment formation. Without doubt it follows that television viewing influences accessibility of relevant constructs, a hypothesis first tested by Shrum and O'Guinn (1993). By measuring the time it took participants to produce prevalence and likelihood estimates of constructs frequently portrayed on television, such as crime and affluence,
these authors confirmed their hypothesis that compared to light viewers, heavy viewers would not only exaggerate judgments of prevalence but they also make them faster. These and other similar studies (Busselle & Shrum, 2003; O'Guinn & Shrum, 1997; Shrum, 1996; Shrum, O'Guinn, Semenik, & Faber, 1991) bolster the proposition that television viewing increases accessibility. Furthermore, it reaffirms that direct experience with constructs also enhances their accessibility, which is consistent with the proposition of resonance discussed earlier. Finally, this research supports the proposition that accessibility mediates the cultivation effect. What follows is a distinction between how accessibility functions in the processing of first and second-order cultivation judgments.

**Accessibility and Judgment Formation**

Judgments of prevalence or frequency (first-order judgments) tend to be memory based (Shrum, 1996). Upon request a person retrieves information from memory and makes a judgment in real time. This type of judgment occurs relatively infrequently in reality. For instance, rarely does an individual ponder the percentage of law enforcement agents employed in the United States. Unless, of course, a curious researcher asks him to make a judgment. The individual then accesses sufficient relative information and makes her estimate. As information from television is storable as well as retrievable, when asked to make a real world judgment, accessibility of that information should mediate the cultivation effect. If accessibility mediates the cultivation effect, heavy viewers, processing heuristically, should more quickly produce higher estimates of prevalence and likelihood than light viewers. Conversely, there should be little difference between
viewers when processing systematically, where the source of information is evaluated (Chaiken, 1987). When systematically processing, individuals are likely to discount television examples as unrepresentative of actual occurrence and any cultivation effect should disappear (Shrum, 2001).

Perhaps the most obvious demonstration of this proposition came from Shrum (2001), who induced participants to engage in either a heuristic or systematic processing strategy when making cultivation judgments. When participants were induced to process heuristically, the cultivation effect remained present, whereas it disappeared when induced to processes systematically. Additionally, the cultivation differential remained consistent between participants induced to process heuristically and those in a control group, suggesting that heuristic processing is the default mode of processing for first-order judgments. Finally, heavy viewers in the heuristic condition responded quicker than light viewers. This author concluded that for first-order judgments, accessibility mediates while processing strategy moderates the cultivation effect.

When explaining second-order cultivation judgments, the process model is flipped sideways. In contrast to memory-based judgments, second-order judgments tend to be made online, such that attitudes, values and beliefs are constructed and adapted as information is received. This occurs relatively more frequently than memory-based judgments, as information instigating attitude, belief and value assessment is encountered often. Formulated in this way, television becomes a form of persuasive communication and factors that facilitate and inhibit persuasion should have a similar impact on
cultivation. In this case, and contrary to their impact on first-order judgments, motivation and ability to process enhance cultivation just as they enhance persuasion, so long as a good argument is presented (Chaiken, 1987). In the case of television, a good argument could be considered an involving program.

To test the proposition that motivation and ability to process moderate attitude change in the case of cultivation, two studies (see Shrum et al., 2005) were conducted that examined the relationship between frequency of television viewing and the personal value of materialism [which has been shown to be consistently portrayed in television programming, (see O'Guinn & Shrum, 1997) as they are affected by motivation and ability to process. Overall, viewing frequency was positively related to level of materialism. This effect was stronger for participants who were motivated to process and had a greater ability to process. Shrum (1999) corroborates these results by demonstrating the converse, that accessibility of relevant attitudes is positively related to television viewing frequency, which is consistent with the frequency of viewing proposition of the Heuristic Processing Model of Persuasion, that frequency of activation increases accessibility.

The cognitive process model of cultivation (Shrum, 2004) highlights a number of striking cultivation findings. First, it reinforces the critique against cultivation analyses producing no cultivation effect when participants are directly or indirectly induced to systematically process the source of the information guiding their judgment [mentioned previously when refuting Wober (1978) and Doob and Macdonald's (1979) critiques].
Following the process model of cultivation, those participants would engage in a source evaluation and no cultivation effects should be expected to surface.

Second, it reinforces the aforementioned resonance refinement made to cultivation. As per the relations between constructs dimension of accessibility, both television and real experiences would be activated when making a cultivation judgment. Consequently, enhanced cultivation is exhibited.

Third, it establishes a foundation on which cultivation is subject to experimental analysis. If individuals incorporate televised material into their attitude value and belief structure at the time of viewing, then it is possible to test for cultivation effects in a single exposure experiment. As such, the following rational is offered in support of four hypotheses that will be tested using an experimental manipulation of television consumption and two hypotheses designed to determine the external validity of the study.

Rationale for Study

Humanity is currently in an ecological bind. On one hand, consumption of goods and material wealth are aspirations attributed to – but ironically negatively related to - well-being (Burroughs & Rindfleisch, 2002). On the other, unsustainable consumption founded on the pretense of infinite growth is causing rapid ecological decline on a global scale (Chapin et al., 2011) and is affecting a delicate balance of biodiversity that sustains human well-being on Earth (Butchart et al., 2010; Leadley et al., 2010). Acclaimed solutions to our ecological crises propose mostly to slow the rate of decline and generate the beginnings of a sustainable consumption-replenishment relationship (Chapin et al.,
2010; Leadley et al., 2010) but a recent CBD Technical Series published by the Secretariat of the Convention on Biological Diversity (Leadley et al., 2010) projects a grim future if no change in human behavior occurs almost immediately. Furthermore, without massively scaled cultural reformation, no solution stands a chance of correcting our current trajectory (Allenby, 2008; Ehrlich & Pringle, 2008; Leadley et al., 2010; Millennium Ecosystem Assessment, 2005; Reisch, 2008a; Steffen et al., 2007).

Due to the communicative nature of culture (Herskovits, 1948), communication research has taken a prominent position in the discussion of humanity's relationship with the finite physical environment (Hansen, 2011; Oskamp, 2000). One such avenue of research investigates television's influence on viewers' attitudes, values and beliefs regarding a variety of environmental issues (Barbas, Paraskevopoulos, & Stamou, 2009; Good, 2007, 2009; Holbert, Kwak, & Shah, 2003; Shanahan, Morgan, & Stenbjerre, 1997). For example, Good (2009) correlated the television viewing of environmentalists with their responses to the NEP (Dunlap, Van Lierre, Mertig, & Jones, 2000), a scale that measures five dimensions of an individual's relationship with the environment. Results suggest a mainstreaming effect such that heavy viewer environmentalists ranked lower on the NEP than light viewer counterparts. Other researchers (Barbas et al., 2009), exposed some participants to a documentary on deforestation then measured their perceptions of environmental sensitivity. As expected, the exposed participants perceived greater environmental sensitivity than the unexposed participants.
Research such as this takes a much-needed first step in identifying what television contributes to humanity's relationship with nature. However, due to the general lack of environmental themes in mainstream television programming (McComas, Shanahan, & Butler, 2001; Shanahan & McComas, 1997) cultivation theory proposes that there should be little to no relationship between overall viewing frequency and environmental attitudes in the general viewing public. In other words, if television is void of environmental themes, there is no reason to believe that it has any effect on the way viewers think about their relationship with the environment. Previous research corroborates this prediction (Good, 2007; Holbert et al., 2003), finding either no significant relationship between overall viewing frequency and environmental attitudes or a slightly negative relationship.

That television is void of environmental content is significant for at least two reasons. First, it identifies a source of enculturation that lacks much needed information regarding humanity's relationship with the natural environment. Second and subsequently, it exposes a potential tool for humanity to begin a cultural reformation on a massive scale. If television programming can be contoured to increase the likelihood that viewers consider their relationship with the natural environment, then change in human behavior on a massive scale could occur sooner and with fewer laggards. Consequently, it becomes necessary for researches to establish that varying content has a predictable effect on viewers and to establish the conditions under which that effect is augmented and inhibited.
Though the body of cultivation research is testament to the effect that television can have on viewers (Morgan & Shanahan, 1999), only recently has a cognitive process model (Shrum, 2004) of cultivation been proposed which facilitates the investigation of the conditions under which the effect is augmented or inhibited with regard to specific content and individual differences. For example, Shrum and colleagues (Shrum et al., 2011) exposed groups to content depicting either the joy of material wealth (Wallstreet), or joy from the absence of material wealth (Gorillas in the Mist) and concluded that the type of content influences viewers' scores on a subsequent measure of personal materialism such that those people viewing more materialistic content report holding stronger materialistic values. This effect is moderated by an individual viewer's attention to the content and ability to process the content (Shrum et al., 2005) as well as narrative involvement, motivation and comprehension (Good, 2009; Shrum et al., 2011).

It follows that a similar relationship should be observed when viewers receive varying levels of environmental content. To this end, the current study endeavors to expose participants to environmental television content (Planet Earth) and generally popular content (The Big Bang Theory) as a control group, then assess corresponding attitudes pertinent to humanity's current ecological dilemma. Scales such as the New Ecological Paradigm (Dunlap et al., 2000) and the Connectedness to Nature Scale (Mayer & Frantz, 2004) directly assess the attitudes and values of interest in this thesis. Previous research has shown certain content to positively influence attitudes regarding the content viewed such that certain content triggers attitude and value assessment regarding that
content (Shrum et al., 2005; Shrum et al., 2011). Thus, the following is expected when manipulating the environmental content of programming:

H1: Participants exposed to environmental television content will indicate greater connectedness to nature than participants exposed to a non-environmental content control.

H2: Participants exposed to environmental television content will indicate greater concern for the environment than participants exposed to a non-environmental content control.

Attention and Television Exposure

Because second-order judgments are formed online, so that information is encoded into the knowledge structure during viewing, then factors that facilitate or inhibit message encoding should likewise affect second-order cultivation (Shrum et al., 2005; Shrum et al., 2011). Thus, prior to delineating the methodological details, attention is paid to the two moderating variables (attention and ability) currently understood to exert influence on the relationship between viewing and cultivation.

Previous research provides little cohesion regarding the effect of viewing attention on cultivation (Good, 2009; Rubin, Perse, & Taylor, 1988; Shrum, 2004). However, the recently developed cognitive process model of cultivation (Shrum, 2004) suggests that the effect of viewing attention on first and second-order judgments is fundamentally different and that this could account for historically inconsistent results. For first-order judgments, viewing attention should have little to no relationship with
cultivation due to increased attention paid to the source of information. In contrast, viewing attention should facilitate the cultivation effect for second-order judgments due to greater processing and encoding of the message (Shrum, 2004; Shrum et al., 2005). Shrum et al. (2005) first tested this proposition in regards to the cultivation of materialistic values. Results confirmed their expectation that viewing attention would moderate the cultivation of materialistic values. That is, participants who paid more attention while viewing cultivated more materialistic values, whereas viewers who paid no attention cultivated none. More recently, Good (2009) shows that viewer attention moderates the relationship between television viewing and the cultivation of environmental values. Thus it is expected that viewing attention will function similarly with regard to environmental programming and the cultivation of environmental values.

H3: There will be an interaction between viewer attention (low or high) and television content (environmental or control) such that participants who pay more attention while viewing environmental content will indicate the greatest cultivation of environmental values, followed by participants viewing environmental content who pay less attention. Participants in the control condition will not indicate cultivation of regardless of attention.

Ability and Television Exposure

The cognitive processing model of cultivation (Shrum, 2004) is founded on the principles of the Elaboration Likelihood Model (ELM) constructed by Petty and Cacioppo (1986). According to this model, ability to process a message plays a strong
role in the reception of that message. Regarding television effects, an individual's ability to process information should moderate cultivation (Good, 2009; Shrum, 2004; Shrum et al., 2005; Shrum et al., 2011) such that individuals with a greater ability to process should exhibit greater cultivation after viewing. To test this notion, Shrum et al. (2005) used the construct of Need for Cognition (NFC) to represent an individual's ability to process television content. After analyzing participant's viewing frequency, NFC, and materialistic values, they concluded that NFC does in fact moderate the relationship between viewing and materialistic values. Participants with a greater ability to process scored higher on scales of materialistic values after viewing materialistically driven television programming. Similarly, Good (2009) tested this notion with regard to environmental values, corroborating the moderating effect first exposed by Shrum and colleagues. Consequently, ability to process is expected function similarly in the current experiment and should moderate the relationship between viewing and attitudes.

H4: There will be an interaction between viewer ability (Low or High) and television content (environmental or control) such that participants who have greater ability to process while viewing environmental content will indicate the greatest cultivation of environmental values, followed by participants who have less ability to environmental content. Participants in the control condition will not indicate cultivation regardless of ability.
External Validity

Given that this study is only one piece of a grander body of research on the cultivation of environmental attitudes and values (Good, 2007; 2009; Holbert et al., 2003; McComas et al., 2001; Shanahan & McComas, 1997) it would be prudent to establish what degree of validity it shares with similar studies. A measure of the cultivation of environmental attitudes based on an aggregate television viewing would suffice to determine the relative consistency in data across studies. If the current study results in a general cultivation differential similar to that of other studies on the same subject then the external validity of the current study is bolstered. There is yet no reason to believe that the sample population of the current study will differ significantly from the sample populations of these other studies. Given that these studies found little or no relationship between general television viewing habits and environmental attitudes (Good, 2007; 2009; Holbert et al., 2003), the same is presumed in the current study. However, it is important to note that in the current case participants' exposure must be controlled for as exposure could confound the relationship between general viewing and environmental attitudes. Thus, the following hypotheses are proposed.

H5: After controlling for condition, there will be a small positive correlation between general television viewing habits and scores on the NEP.

H6: After controlling for condition, there will be a small positive correlation between general television viewing habits and scores on the CNS.
Individual Contributions of Attention and Ability

The controlled contribution of each of these moderating variables (attention, ability) to variance in cultivation is yet unknown. Though determining the individual effect of each moderator is an important addition to cultivation research, investigating the extent to which each moderator accounts for unique variation in cultivation is the next step. Therefore a research question is posed to direct this query:

RQ1: What is the individual contribution of attention and ability when accounting for the total variance in cultivation differentials?
Chapter 3

METHODOLOGY

Induction Check

To ensure the independent variable is accurately manipulated an induction check was conducted prior to the main experiment. Unless otherwise noted, factors are composed of Likert-type items ranging from very strongly disagree (1) to very strongly agree (7). To test the measurement model's reliability and internal consistency a confirmatory factor analysis was conducted on the items specified *a priori* to measure only one factor (Anderson, Gerbing, & Hunter, 1987; Hunter & Gerbing, 1982; Levine, 2005).

Participants

Participants were 103 students from a large western university taking communication courses. The average age of participants was 20.8 ($SD = 2.53$) and ranged from 18-28. There were 62 female participants and 41 male participants. Regarding race, 21.2% reported being Asian/pacific islander, 12.3% reported being African American, 18.5% reported being Latino, 33.7% reported being Caucasian, 2.2% reported being Middle Eastern, and 12.8% reported other. Regarding year in school, 35.3% reported being a first year student, 12.5% reported second year, 31.7% reported third year, 11.6% reported fourth year, 6.3% reported fifth year and 2.6% reported being in their sixth or greater year.
Procedure

Participants viewed five minutes of either *Planet Earth* (environmentally sensitive) or *The Big Bang Theory* (non-environmentally sensitive). Following this exposure participants completed surveys containing items pertaining to the environmental content of the program, the entertainment value of the program, how exciting the program is and how interesting the program is. These factors were selected to reduce the likelihood that a spurious relationship would arise due to an unconsidered difference in the content of each program. It is expected that participants would perceive *Planet Earth* to be more focused on the natural environment than *The Big Bang Theory* but indicate no difference in entertainment, interest or excitement between the two.

Induction Measures

*Environmental content.* A five-item scale (see Appendix A) measuring the degree to which participants perceive environmental content in a television program was developed for use in this study. Questions regard the imagery and scenery of a television program and include statements such as "This program was about nature" and "I noticed that the majority of scenery in this program was natural outdoor landscape."

Confirmatory factor analysis revealed low errors between the predicted and actual correlations for tests of internal consistency and parallelism. Furthermore, reliability for this scale was high (α = .96) so the items were combined to form a single score. A *t*-test (*t* (101) = 21.69, *p* < .001, *r* = .91) indicated that the *Planet Earth* (Mean = 5.74, SD = 1.19)
was rated as having more environmental content than the control condition (Mean = 1.52, SD = .73), confirming that the manipulation achieved its intended effect.

Entertainment. A four-item scale (see Appendix A) measuring the level of entertainment perceived by participants watching a television program was developed for use in this study. Respondents are asked to indicate their level of agreement with statements such as "I thought that this program was entertaining" and the reverse coded "I was bored while watching this program." Confirmatory factor analysis revealed low errors between the predicted and actual correlations for tests of internal consistency and parallelism. Furthermore, reliability for this scale was high ($\alpha = .85$) so items were combined to form a single score. A $t$-test ($t (101) = 2.41$ $p < .05$, $r = .23$) indicated that Planet Earth (Mean = 5.05, SD = 1.38) was rated as less entertaining than the control condition (Mean = 5.66, SD = 1.22). The implications of this difference are discussed in the limitations and future research section of this thesis.

Excitement. A four-item scale (see Appendix A) measuring the level of excitement a participant feels while watching a television program was developed for use in this study. Respondents are asked to indicate their level of agreement with statements such as "I thought that this program was exciting" and "I felt excited because of this program." Both confirmatory factor analysis and Cronbach’s Alpha reliability test indicated that one of the items on this scale did not fit the measurement model. This item was therefore removed from further analysis. The remaining items resulted in a highly reliable scale ($\alpha = .91$) and items were combined to form a single score. A $t$-test ($t = .73$ $p$
\[
\begin{aligned}
&= .47 \) indicated that the Planet Earth (\( M = 4.02, \text{SD} = 1.57 \)) and the control condition \\
&\quad (\text{Mean} = 4.24, \text{SD} = .1.54)\) did not differ in the level of excitement participants reported. \\

\textit{Interest}. A four-item scale (see Appendix A) measuring the level of interest a participant takes in a television program was developed for use in this study. Respondents are asked to indicate their level of agreement with statements such as "I was very interested in this program" and the reverse coded "I felt indifferent to this program." Confirmatory factor analysis revealed low errors between the predicted and actual correlations for tests of internal consistency and parallelism. Furthermore, reliability for this scale was high (\( \alpha = .87 \)) so items were combined to form a single. A \( t \)-test (\( t = .34, p = .73 \)) indicated that Planet Earth (\( \text{Mean} = 4.89, \text{SD} = 1.44 \)) and the control condition (\( \text{Mean} = 4.98, \text{SD} = .1.37 \)) did not differ in the level of interest participants reported.

\textbf{Main Study}

\textit{Participants}

One hundred fifty-nine students from a large western state university participated in this study. Due to the size and location of the university, the sample is slightly more diverse than typical studies. Participants had an average age of 21.5 (SD = 4.49), ranging from 18-61. There were 56 males and 97 female participants. Regarding race, 17.5\% reported being Asian/pacific islander, 14.3\% reported being African American, 14.9\% reported being Latino, 35.7\% reported being Caucasian, 3.9\% reported being Middle Eastern, and 13.6\% reported other. Regarding year in school, 20.8\% reported being a first year student, 13.6\% reported second year, 34.4\% reported third year, 15.6\% reported
fourth year, 11.3% reported fifth year and 3.9% reported being in their sixth or greater year.

Procedure

Based on two previous studies with similar intent (Shrum et al., 2005; Shrum et al., 2011), participants in the current study were exposed to one of two 19-minute video clips of either Planet Earth (environmental content) or The Big Bang Theory (non-environmental control). Planet Earth is a critically acclaimed and award winning nature documentary with a strong focus on the unseen beauty of the natural environment. The Big Bang Theory is a top rated sitcom (Nielsen, 2011) that airs during prime-time television and has no direct or obviously environmental content. To ensure that a singular message within either program does not confound the results of this study, the video clips have been edited to remove any leading statements regarding environmental degradation.

After watching the video clips, participants received a survey packet including the measures defined below as well as typical demographic measures. To be certain that source priming (Shrum, 2001) does not confound the results, any measures involving television viewing were placed at the end of the survey. The participants were ostensibly participating in three different studies. The first regards the programs viewed and includes a restatement of the entertainment, excitement and interest measures as well as the attention and ability measures. The second study is purported to be an assessment of college students' perspective on environmental issues and includes the NEP and Connectedness to Nature Scales. The final study was introduced as an assessment of the
television viewing habits of college students and includes the television viewing measures. Once every participant had completed the packet they were debriefed and given contact information for any future inquiries.

Instrumentation

Except where noted, all scales were composed of Likert-type items on a seven-point scale such that a (1) indicated that the participant strongly disagreed with the statement and a (7) indicated that they strongly agree. To test the measurement model's reliability and internal consistency a confirmatory factor analysis was conducted on the items specified a priori to measure only one factor (Anderson et. al., 1987; Hunter & Gerbing, 1982; Levine, 2005). Due to the number of items in the survey, this analysis was conducted only on items that were not included in the manipulation check, as well as items that have previously determined internal consistencies (see Dunlap et. al., 2000; Mayer & Frantz, 2004). Internal consistency tests indicated one item exceeding the acceptable standard for errors between items measuring the same construct. Thus, one of the attention scale items was removed. Other items were within sampling error of zero for items measuring the same construct. Likewise, the parallelism check indicated that items were within sampling error of zero, or that errors varied consistently within constructs, suggesting parallelism.

Independent Variables

Television viewing. As the television viewing measure has been a point of contention among cultivation scholars (Morgan & Shanahan, 1999) extra care is taken in
this thesis to ensure the accuracy of the television viewing measure. Television viewing was assessed in three ways. The first (see Appendix A) is modeled after Gerbner and Gross (1976) and Shrum's (2001) measure and asks participants to estimate the amount of time they spend watching television on a given weekday, Saturday and Sunday. This measurement instrument resulted in a mean of 2.95 hours of viewing per day ($\alpha = .70$, $SD = 2.06$). This means that the sample population watches approximately three hours of television on a given day. This number is a bit lower than the average U.S. citizen, but is consistent with other studies of college students. Given the high reliability of this scale, items were combined to form one score.

A second television viewing measure (see Appendix A) asks participants to estimate the amount of time in a week they spend watching each of 13 program categories: daytime soap (mean = operas, news, sports, reality t.v., movies, situation comedies (sitcoms), dramas (such as hospital or crime dramas), music, talk shows (day), talk shows (night), game shows, nature documentaries, other documentaries. This measure resulted in an average daily viewing time of 2.2 hours ($SD = 2.4$). The difference in daily hours reported between this scale and the first is demonstrative of the unreliability of television viewing measures and the reason this study utilizes three different measures.

A final measure (See Appendix A) is modeled after Shrum et al.'s (2011) attitudinal measures in which respondents are asked for their agreement with statements such as "I have to admit, I watch a lot of television." This scale had a mean of 3.83 ($\alpha = \ldots$)
.88, SD =1.67). This number is not to be confused with average viewing hours per day. This estimate measures self-reflected attitudes about time spent watching television. It is assumed that the higher the participant’s score, the heavier of a viewer they are. Given the high reliability for this scale, items were collapsed to form one factor.

This variety of measures should provide an adequate observation of viewers' actual viewing frequency. Though the latter measure remains independent of the former measures, if the former continuous measures correlate significantly (.70 or greater for the purposes of this study) they could be averaged and combined into one item. Analysis indicates a significant but small correlation between the hours per day and itemized hours per week measure ($r = .30$, $p < .001$). As these measures were not correlated to the predetermined standard, they were not combined into one factor. Thus, hypothesis five and six are tested using each of the independent television viewing measures.

**Attention.** A five-item (see Appendix A) viewer attention scale (Ruben, Perse & Taylor, 1988) was used to measure viewer attention. Respondents were asked to indicate their agreement with statements such as "I listen carefully when I watch television" or the reverse coded, "My mind wanders off when I watch television." Confirmatory factor analysis indicated that one of items of this scale was inconsistent with the proposed unidimensional measurement model and it was therefore deleted. Subsequent analysis indicates a high reliability for this scale ($\alpha = .92$). The mean score on this scale was 5.13 (SD = 1.69). Thus, participants were split such that those with scores at or below 5.13
were considered low attention and those with scores above 5.13 were considered high attention.

*Ability.* The five-item (see Appendix A) short Need for Cognition (NFC) scale (Epstein, Pacini, Dene-Raj, & Heier, 1996) was used as a model for viewer ability. Due to the relatively low reliability exhibited in similar studies (Good, 2009; Shrum, Burroughs & Rindfleisch, 2005) two items from the original measure (Cacioppo & Petty, 1982), "Thinking is not my idea of fun" and "I prefer life to be filled with puzzles that I must solve" are added to the short form in an attempt to increase internal consistency, resulting in a seven item scale. Participants rated their agreement (1 strongly disagree to 7 strongly agree) with attitude statements such as "I prefer complex to simple problems". The short form NFC had a mean of 4.76 (SD = 1.13) and the scale exhibited high reliability ($\alpha = .79$). Thus, items were combined to form a single score. To separate high NFC from low NFC responses, participants were split at the mean such that participants at or below 4.76 were considered low, and participants greater than 4.76 were considered high.

**Dependent Variables**

*Environmental concern.* The 15-item New Ecological Paradigm (NEP) scale (see Appendix A) (Dunlap et al., 2000) was used to measure environmental concern. This scale assesses five dimensions of an individual's "ecological worldview": reality of limits to growth, anti-anthropocentrism, fragility of nature's balance, rejection of exemptionalism (that humans are exempt from the rest of the environment) and the
possibility of an eco-crisis. Higher scores on the NEP indicate a greater concern for each of these facets of the natural environment. Each facet remains an individual measure unless analysis indicates that the measures are significantly correlated enough to create a single construct of environmental concern. Such a process is suggested (Dunlap et al., 2000), has occurred in previous research (e.g. Good, 2007) and is expected to occur here.

Analysis indicates that the scale exhibits high reliability ($\alpha = .75$) but the individual dimensions have varied and much lower reliabilities, such that the reliability for the limits dimension was $\alpha = .54$. Deleting one of the items of this scale resulted in an acceptable reliability ($\alpha = .73$,) and was deleted. The anti-anthropocentrism dimension exhibited an acceptable reliability of $\alpha = .69$. The balance dimension exhibited a moderate reliability of $\alpha = .52$. The anti-exemptionalism dimension exhibited a very low reliability ($\alpha = .08$). Lastly, the eco-crisis dimension exhibited an acceptable reliability of $\alpha = .65$. Given the variability in reliability between the individual dimensions, the scales were combined into one NEP factor measuring participants’ ecological worldview. The mean score on this measure was 4.38 ($\alpha = .75$, SD = .78).

**Connectedness to nature.** As the NEP measures cognitive aspects of environmental concern, the Connectedness to Nature scale (CNS) measures affective aspects of environmental concern (see Appendix A) (Mayer & Frantz, 2004). The CNS assesses the degree to which an individual considers the natural environment and self the same. It measures an individual's "experiential sense of oneness with the natural world" (Mayer & Frantz, 2004, p. 504). Participants respond to 14 Likert-type items ranging
from 1 (strongly disagree) to 7 (strongly agree). They are asked for their agreement to statements such as "I often feel part of the web of life," and "I often feel a sense of oneness with the natural world around me." Higher scores on the CNS indicate a greater affective connection to the natural world. The scale is shown to have high internal and external reliability (Mayer & Frantz, 2004) and is expected to exhibit the same qualities in this study. Analysis confirms this presumption, indicating a high reliability ($\alpha = .83,$) for this scale and therefore the items were combined to form a single score. The mean score on this scale was 4.49 (SD = .97).
Chapter 4

RESULTS

Hypothesis one predicted that participants exposed to environmental television content will indicate greater connectedness to nature than participants exposed to a non-environmental content control. To test these differences, a t-test was calculated. For these data, $t(157) = .47, p = .63$ revealed no difference in participants’ connectedness to nature between the environmental television content ($M = 4.52, SD = 1.01$) and the non-environmental content control condition ($M = 4.44, SD = .92$). Thus, the null for hypothesis one could not be rejected.

Hypothesis two predicted that participants exposed to environmental television content will indicate greater concern for the environment than participants exposed to a non-environmental content control. Concern for the environment was measured using the New Ecological Paradigm scale (Dunlap et al., 2000). To test these differences, a $t$-test was calculated. For these data, $t(156) = .69, p = .49$, revealed no difference in participants’ concern for the environment between the environmental television content ($M = 4.41, SD = .81$) and the non-environmental control condition ($M = 4.31, SD = .74$). Thus, the null for hypothesis two could not be rejected.

Though no main effect exists for type of content, the literature review suggests that the relationship between viewing and cultivation may be moderated by both attention to the program and ability to process the information. Thus, the lack of relationship
observed in testing hypothesis one and two could be confounded due to these moderating variables.

Hypothesis three predicted that there will be an interaction between viewer attention (low or high) and television content (environmental or control) such that participants who pay more attention while viewing environmental content will indicate the greatest cultivation of environmental values, followed by participants viewing environmental content who pay less attention. Participants in the control condition will not indicate cultivation regardless of attention. Two contrast analyses were conducted, one using CNS as the outcome variable, and the other using scores on the NEP as the outcome variable to test this hypothesis. Contrast coefficients were established a priori, and are consistent with the hypothesized predictions. It was predicted that environmental values would be highest in the environmental content, high attention condition (+3), followed by the environmental content, low attention condition (+1), and that the non-environmental, high and low attention would not show any signs of cultivation (-2, -2). Regarding the CNS, results indicate no support for the hypothesized predictions ($t(155) = .77, p = .44$). An examination of the means (see Table 1 in Appendix B) suggests a potential alternative association between variables than what was predicted. Specifically, the raw means show a potential trend that the means differ such that the coefficients for the aforementioned conditions should be (+3), (-1), (-1), and (-1) respectively. Applying these contrasts, the alternative hypothesis was tested. Results do not support these differences ($t(155) = 1.09, p = .28$). As such, no meaningful patterns in this data were
found and neither variable was determined to be a unique or interactive predictor of scores on the CNS.

Regarding the NEP, results do not support the hypothesized predictions ($t(155) = .76, p = .45$). An examination of the means (see Table 2 in Appendix B) similarly suggests an alternative pattern of coefficients. In particular, the raw means show a potential trend such that the contrast coefficients become (+1), (-1), (+1), and (-1) respectively. Applying these contrasts, the alternative hypothesis was tested. Results did not support these differences ($t(154) = 1.31, p = .19$). Thus, the null for hypothesis three could not be rejected, though the trend in the data indicates that there may be an effect that is nullified due to extraneous factors.

Hypothesis four predicted that there would be an interaction between viewer ability (low or high) and television content (environmental or control) such that participants who have greater ability to process while viewing environmental content will indicate the greatest cultivation of environmental values, followed by participants who have less ability. Participants in the control condition will not indicate cultivation regardless of ability. Two contrast analyses were conducted, one using CNS as the outcome variable, and the other using scores on the NEP as the outcome variable to test this hypothesis. Contrast coefficients were established \textit{a priori}, and are consistent with the hypothesized predictions. It was predicted that environmental values would be highest in the environmental content, high ability condition (+3), followed by the environmental content, low ability condition (+1), and that the non-environmental, high
and low attention would not show any signs of cultivation (-2, -2). Regarding the CNS, results indicate no support for the hypothesized predictions ($t(155) = 1.02, p = .31$). An examination of the means (See Table 3 in Appendix B) suggests a potential alternative pattern than what was predicted. Specifically, the raw means show a potential trend that the means differ such that the coefficients for the aforementioned conditions should be (+1), (-1), (+1), and (-1) respectively. Applying these contrasts, the alternative hypothesis was tested. Results did not support these differences ($t(155) = 1.72, p = .09$). As such, no meaningful patterns in this data were found and neither variable was determined to be a unique or interactive predictor of scores on the CNS.

Regarding the NEP, results do not support the hypothesized predictions ($t(154) = 1.51, p = .13$). An examination of the means (see Table 4 in Appendix B) similarly suggests an alternative pattern of coefficients. In particular, the raw means show a potential trend such that the contrast coefficients become (+3), (-1), (-1), and (-1) respectively. Applying these contrasts, the alternative hypothesis was tested. Results support a magic cell ($t(154) = 2.48, p < .05, r = .19$) such that participants in high ability, environmental content condition ($M = 4.62, SD = .69$) scored highest on the NEP, while the other three conditions did not differ from each other (see Appendix C for means). These data are consistent with the proposed hypothesis in that there was an interaction effect as predicted, though this effect is almost negligible. Thus, the null for hypothesis four is rejected.
Hypothesis five predicted that there will be a small positive correlation between general television viewing habits and scores on the NEP. Results indicate no correlation \((r = -.047, p = .56)\) between general viewing and scores on the NEP using the first television viewing measure, a small negative but insignificant correlation \((r = -.10, p = .18)\) using the hours per week measure, and no correlation \((r = .00, p = .96)\) using the attitudinal television viewing measure. Given these findings, the null hypothesis for hypothesis five could not be rejected.

Hypothesis six predicted that there will be a small positive correlation between general television viewing habits and scores on the CNS. Results indicate no correlation \((r = -.06, p = .41)\) using the hours per day television measure, no correlation \((r = .06, p = .44)\) using the hours per week measure, and no correlation \((r = -.02, p = .73)\) using the attitudinal measure. Given these findings, the null hypothesis for hypothesis could not be rejected. The research question asked what contribution each attention and ability make to the overall cultivation differential. Because no cultivation was observed, this question becomes unanswerable using the current data. Therefore no analysis was conducted.
Chapter 5
DISCUSSION

The overall pattern in these data leads to the conclusion that environmental television content may influence environmental values during viewing, but this effect is moderated by a viewer’s ability to process the content, and is trivial at best. Only one miniscule relationship was observed between television content, ability to process, and cultivation. These results are not surprising given the traditionally low correlations and effect sizes associated with cultivations studies. The two meta-analyses to date (Dossche & Van den Bulck, 2010; Morgan & Shanahan, 1999) conclude that the average cultivation differential is $r = .09$, a relatively small effect. As such, the results of this study can be considered typical, especially given the topic of environmental content.

Cultivation analyses of the relationship between television viewing and environmental values have indicated mostly that there is little to no relationship between viewing and environmental values, and that when one does arise, it is negative (Good, 2007; Holbert et al., 2003). Consistent with cultivation predictions, this absence of relationship is likely due to the lack of environmental content in television programming (McComas et al., 2001; Shanahan & McComas, 1997). This notion is also supported by research indicating a mainstreaming effect for environmentalists watching television such that heavy viewing environmentalists indicate less environmentally friendly values than environmentalists who watch less television (Good, 2009). Thus, the current study
provides some evidence to support the claim that no cultivation effect should be expected regarding environmental values.

Additionally, the results of this study corroborate seminal cultivation predictions: that cultivation is the accumulation of television consumption, not something that occurs during a single viewing. Only two other studies have tested the notion that cultivation can occur during a single viewing (Shrum et al., 2005; Shrum et al., 2011). As with the current study, these studies restricted their analyses to second-order cultivation, which is the cultivation of attitudes and values. Recent research indicates that second-order cultivation occurs during viewing (Shrum, 2004) as viewers incorporate new information into their knowledge structure. The results of the current study shed some doubt on this notion and should be considered when conducting similar analyses in the future. Though slight cultivation was observed, the effect size is so small that it is more likely that this effect is spurious. Only a trivial cultivation effect was observed following a single viewing, and, though many measures were used, this effect arose in only one magic cell. Given such a small effect size, it is best to limit any conclusions drawn from the data to the overall trend, which was no effect.

Regardless, that the null for hypothesis four was rejected lends some small support to the online nature of second-order cultivation, though this conclusion must be drawn hesitantly. In partial support of this is the general trend in means of the contrast analysis. The environmental content, high attention and high ability conditions were consistently greater than the other three conditions regardless of the cultivation measure
used. These differences were insignificant, but do point toward potential effects. If indeed this is the case, more research is needed to draw sound conclusions on the matter. One potential avenue for future researchers is to explicate the distinction between momentary persuasion and cultivation. Though some research indicates a potential for immediate cultivation during viewing (Shrum et al., 2005; Shrum et al., 2011) this effects may be a function of persuasion, as suggested by the cognitive processing model directing the experiment. This model is derived from models of persuasion. A longitudinal study, assessing attitudes and values over a period of time as well as after individual episodes of television consumption, would lend more conclusive support to the online nature of second-order cultivation.

A final but subsidiary result of this study is a case for the validity of the three television viewing and two environmental values measures used. Each television measure exhibited similar relationships with the dependent variables. Likewise, each environmental values measure varied similarly with each independent variable. As researchers continue to modify and improve their operationalizations, the results of this study can be used in support of a case for the validity of each of the measures, or the selection of one over another.

Limitations and Future Research

This study is limited in many ways. First, the design is based on comparing two actual television programs, the qualities of which may differ in aspects that were not measured and controlled for. Though steps were taken to avoid some potential confounds
associated with using actual television programs (namely, how entertaining, interesting and exiting the program is) it is possible that uncontrolled differences interfered with the quality of the results. For example, one such variable that was not measured but could potentially influence responses is how humorous the program is. Humor evokes positive emotions, which could influence responses to the NEP and CNS. Generally speaking, a qualitative evaluation of the audiences’ response to the video showings suggests that the control program, *The Big Bang Theory*, was more humorous than the experimental program. In contrast, it appeared that the experimental program was more dramatic than the control, another potential aspect on which these shows differ. The tension associated with drama could also influence responses to the NEP and CNS. Future studies of this nature should measure additional and varying constructs that reduce the unknown number of potential extemporaneous variables associated with using actual television programs. Specifically, future research should consider the nature of presenting environmental programming, be it fearful (*An Inconvenient Truth*) or inspirational (*Planet Earth*) and whether or not the mode of presenting environmental content influences cultivation.

A second limitation is that the sample population can influence the intensity of the observed cultivation effect such that student populations exhibit less of an effect than adult, non-student populations (Dossche & Van den Bulck, 2010; Morgan & Shanahan, 1999). It is unknown why this difference exists, though some authors speculate that it may be a function of the socially desirable response effect, or a priming effect due to the skeptical nature of students who have learned of television’s potential effects. The
participants of this study were students at a large western university who were enrolled in communication courses. The average age of these participants was 21.5, and the majority reported being third year students (34.4%). Thus it is likely that the sample population confounded the results of this study. Whether this occurred because the sample is younger and more skeptical, or because they were primed by their education is unknown. In defense of this studies validity, however, it is not yet clear whether the difference in observed cultivation between student and adult samples is due to some extemporaneous variable. For example, the subject matter in question could result in varying cultivation differentials depending on age. Thus, it could be that a cultivation effect would be observed in an adult sample because of a broader and more developed understanding of environmental issues than younger students.

Additionally, it is possible that the current sample population has strong pre-existing attitudes regarding the environment, so much so that exposure to various television programs has no effect on their attitude. As no pretest was conducted to determine standing attitudes and values regarding the environment, this is impossible to determine in the current study. Future research should consider pre-test, post-test designs to identify more accurately any changes in attitude that might result from viewing environmental content.

Another limitation of this study is the cumbersome nature of the survey instrument. The questionnaire was composed of over 70 items, which can become tedious for participants. Additionally, the questionnaire included three different measures
of television viewing. These items especially would have become cumbersome and
could have affected the accuracy with which participants indicated their viewing
frequency. Previous research has indicated that asking participants to indicate the
number of hours they spend watching specific types of programs, or even the number of
hours they spend watching television on a particular day of the week, will result in
inaccurate responses (Morgan & Shanahan, 1999).

A final limitation of this study is the small sample size. Given the relatively small
effect sizes of cultivation differentials, it could be that the observations made in this study
are merely the result of sampling error. Securing a larger sample size would better
validate the results. Future analyses should ensure a large sample size in order to observe
possibly small effect sizes.

Due to these significant limitations, doubt can be raised regarding the validity of
the results of this study. However, they should not be disregarded. Most cultivation
studies are plagued by one or more of the same limitations and the external validity of
this study was confirmed by the similarity between the current results and results of
previous research on television and environmental attitudes (Good, 2007; Holbert et al.,
2003). Future research should consider the many confounds involved in cultivation
research, particularly when testing the online nature of second-order cultivation.

Conclusion

This study tested the notions that second-order cultivation occurs during viewing,
that viewing environmental television content influences attitudes and values related to
the environment, and that this influence would be moderated by viewers’ attention to the program and ability to process. Results support the traditional understanding of cultivation, that cultivation is the culmination of accumulated viewing over time. Additionally the results of this study corroborate previous research indicating a lack of relationship between television viewing and attitudes and values regarding the environment. Perhaps most importantly, this study demonstrates the need for researchers to consider viewers’ need for cognition when assessing environmental values. Lastly, this study takes a much needed step in the direction of using actual television programming when testing for cultivation effects, something that has traditionally been taboo due to the potential confounds involved with not using experimenter controlled material.

In conclusion, it is as important now than ever to propose and test avenues through which humanity’s relationship with the environment can be modified. The current study suggests that television may not be the most efficient vehicle of change in this matter. However, more research is needed to support this conclusion, and the results of this study alone should not dissuade future attempts at testing television’s efficiency at cultivating environmentally friendly attitudes and values. Future researchers should focus on identifying additional confounds to the cultivation process that have not yet been identified and continue to improve the Cultural Indicators methodology.
APPENDIX A

Instruments

*Environmental Content*

1. This program was composed mostly of images of the natural environment
2. This program was about nature
3. I noticed that the majority of scenery in this program was natural outdoor landscape.
4. I observed a lot of animals and other creatures in their natural habitat while watching this program.
5. I would classify this program as a nature documentary
Entertainment

1. I thought that this program was entertaining
2. I was bored while watching this program (R).
3. I found this program amusing.
4. This program kept my attention.
Excitement

1. I thought that this program was exciting.

2. This program was dull (R).

3. I would describe this program as exciting.

4. I felt excited because of the program.
Interest

1. I was very interested in the program.

2. The program peaked my interest.

3. I would describe this program as interesting.

4. I felt indifferent to the program (R).
Attention

1. I was often thinking about something else while watching this program (R).
2. I often missed what was happening on this program while I watched (R).
3. My mind often wandered while I watched this program (R).
4. I paid close attention to the program while I watched.
5. I listened carefully while I watched this program.
**Television Viewing Measure, Part 1**

1. How much time (e.g. 1.5 hours) on a typical weekday do you spend watching television? ________ hrs _______ min  
2. How much time do you spend watching television on a typical Saturday? ________ hrs _______ min  
3. How much time do you spend watching television on a typical Sunday? ________ hrs _______ min  

**Appendix F**  
*Estimate the number of hours you spend during an average week watching any of the following program types.*

<table>
<thead>
<tr>
<th>PROGRAM TYPE</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAYTIME SOAP OPERAS</td>
<td></td>
</tr>
<tr>
<td>NEWS</td>
<td></td>
</tr>
<tr>
<td>SPORTS</td>
<td></td>
</tr>
<tr>
<td>REALITY TV</td>
<td></td>
</tr>
<tr>
<td>MOVIES</td>
<td></td>
</tr>
<tr>
<td>SITCOMS (SUCH AS FAMILY GUY OR TWO AND A HALF MEN)</td>
<td></td>
</tr>
<tr>
<td>DRAMAS (SUCH AS HOSPITAL OR CRIME DRAMAS)</td>
<td></td>
</tr>
<tr>
<td>MUSIC</td>
<td></td>
</tr>
<tr>
<td>DAYTIME TALK SHOWS</td>
<td></td>
</tr>
<tr>
<td>NIGHT TIME TALK SHOWS</td>
<td></td>
</tr>
<tr>
<td>GAME SHOWS</td>
<td></td>
</tr>
<tr>
<td>NATURE DOCUMENTARIES</td>
<td></td>
</tr>
<tr>
<td>OTHER DOCUMENTARIES</td>
<td></td>
</tr>
</tbody>
</table>
Television Viewing Measure, Part 2

1. I watch less television than most people I know (R)

2. I often watch television on weekends.

3. I spend time watching television almost every day.

4. One of the first things I do in the evening is turn on the television.

4. I hardly ever watch television (R).

5. I have to admit, I watch a lot of television.
Television Viewing Measure, Part 3

1. I was often thinking about something else while watching this program (R).

2. I often missed what was happening on this program while I watched (R).

3. My mind often wandered while I watched this program (R).

4. I paid close attention to the program while I watched.

5. I listened carefully while I watched this program.
Need for Cognition (NFC) scale

1. I don't like to have to do a lot of thinking (R).

2. I try to avoid situations that require thinking in depth about something (R).

3. I prefer to do something that challenges my thinking abilities rather than something that requires little thought.

4. I prefer complex to simple problems.

5. Thinking hard and for a long time about something gives me little satisfaction (R).

6. Thinking is not my idea of fun (R).

7. I prefer life to be filled with puzzles that I must solve.
New Ecological Paradigm (NEP) scale

1. We are approaching the limit of the number of people the earth can support

2. Humans have the right to modify the natural environment to suit their needs

3. When humans interfere with nature it often produces disastrous consequences

4. Human ingenuity will insure that we do NOT make the earth unlivable.

5. Humans are severely abusing the environment.

6. The earth has plenty of natural resources if we just learn how to develop them.

7. Plants and animals have as much right as humans to exist.

8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.

9. Despite our special abilities humans are still subject to the laws of nature.

10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.

11. The earth is like a spaceship with very limited room and resources.

12. Humans were meant to rule over the rest of nature.

13. The balance of nature is very delicate and easily upset.

14. Humans will eventually learn enough about how nature works to be able to control it.
15. If things continue on their present course, we will soon experience a major ecological catastrophe.
Connectedness to Nature scale (CNS)

1. I often feel a sense of oneness with the natural world around me.
2. I think of the natural world as a community to which I belong.
3. I recognize and appreciate the intelligence of other living organisms.
4. I often feel disconnected from nature.
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
6. I often feel kinship with animals and plants.
7. I feel as though I belong to the earth as equally as it belongs to me.
8. I have a deep understanding of how my actions affect the natural world.
9. I often feel part of the web of life.
10. I feel that all inhabitants of earth, human, and nonhuman, share a common 'life force'.
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.
13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground of the birds in the trees.
14. My personal welfare is independent of the welfare of the natural world.
## APPENDIX B

Data Tables

### Table 1

<table>
<thead>
<tr>
<th>Environmental Content</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.63, SD = 0.99$</td>
</tr>
<tr>
<td></td>
<td>$P(4.34 \leq \mu \leq 4.92) = .95$</td>
</tr>
<tr>
<td>Low Attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.43, SD = 1.02$</td>
</tr>
<tr>
<td></td>
<td>$P(4.16 \leq \mu \leq 4.69) = .95$</td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th>Environmental Content</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.46, SD = 0.88$</td>
</tr>
<tr>
<td></td>
<td>$P(4.21 \leq \mu \leq 4.72) = .95$</td>
</tr>
<tr>
<td>Low Attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.37, SD = 0.77$</td>
</tr>
<tr>
<td></td>
<td>$P(4.17 \leq \mu \leq 4.57) = .95$</td>
</tr>
</tbody>
</table>

### Table 3

<table>
<thead>
<tr>
<th>Environmental Content</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.72, SD = 1.12$</td>
</tr>
<tr>
<td></td>
<td>$P(4.41 \leq \mu \leq 5.04) = .95$</td>
</tr>
<tr>
<td>Low Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M = 4.33, SD = 0.86$</td>
</tr>
<tr>
<td></td>
<td>$P(4.10 \leq \mu \leq 4.56) = .95$</td>
</tr>
</tbody>
</table>
Table 4

<table>
<thead>
<tr>
<th></th>
<th>Environmental Content</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Ability</strong></td>
<td>$M = 4.62$, $SD = 0.70$</td>
<td>$M = 4.22$, $SD = 0.85$</td>
</tr>
<tr>
<td></td>
<td>$P(4.43 \leq \mu \leq 4.81) = .95$</td>
<td>$P(3.85 \leq \mu \leq 4.59) = .95$</td>
</tr>
<tr>
<td><strong>Low Ability</strong></td>
<td>$M = 4.23$, $SD = 0.87$</td>
<td>$M = 4.40$, $SD = 0.65$</td>
</tr>
<tr>
<td></td>
<td>$P(3.99 \leq \mu \leq 4.46) = .95$</td>
<td>$P(4.15 \leq \mu \leq 4.65) = .95$</td>
</tr>
</tbody>
</table>
REFERENCES


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Shrum, L. J. (2004). The cognitive processes underlying cultivation are a function of whether the judgments are on-line or memory based. *Communications: The European Journal of Communication, 29*, 327-344.


