

AAPP Monograph Series
African American Professors Program

John McFadden, PhD
Executive Editor
University of South Carolina

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FOREWORD

It is truly an honor to have been asked to prepare the Foreword for the 2016 African American Professors Program (AAPP) Monograph Series. As I thought about what I should write, I began to reflect on my experience as a University of South Carolina student and, at that time, as an AAPP Scholar. It became clear that documenting my story makes it accessible to others. My hope is that my story and the scholarly works that follow provide information and inspiration to do something great, whether that is persisting when feeling defeated, making the decision to mentor someone, or moving your research in a new direction, perhaps in collaboration with one of the series authors.

My story begins in the weeks leading to my decision to pursue a PhD in Chemical Engineering at the University of South Carolina (USC). I was nearing completion of the Master of Science degree program in Chemical Engineering at North Carolina Agriculture and Technical State University and had been blessed to have letters of acceptance from four other schools. Each school was much larger and predominantly White; so, this was likely to be a very different educational experience. Fortunately, I had the opportunity to visit all of the prospective campuses, and I developed a list of advantages and disadvantages for each one. During the USC campus visit, I met Dr. Aretha B. Pigford, Founding Director of the African American Professors Program and Mrs. Rhittie L. Gettone, Administrative Coordinator of AAPP, and I immediately felt supported. It was moving to learn that the host professor for my visit, Dr. Michael Matthews,

Department of Chemical Engineering, arranged for this meeting because he knew of my interest in the professoriate, and he indicated he would gladly serve as my AAPP Faculty Mentor. AAPP distinguished USC from the rest of the schools on my list, and the opportunity to be an AAPP Scholar ultimately drove my final decision.

Within the first year and a half of arriving in Columbia, a series of events made me wonder if I had made the right decision. In an impromptu meeting with the Chemical Engineering Graduate Director upon first arriving on campus, I was told that some people in the department didn't think I was going to make it. Next, was the troubling discovery that I was a triple minority among the other chemical engineering graduate students (i.e., female, Black, and American). Several weeks later I failed the qualifying exams, which meant I had to repeat a few undergraduate courses. Then came the humiliation of being the only graduate student in the undergraduate courses and responding to the students' questions of who I was and why I was there. If that wasn't enough, when I began my research, the young lady with whom I shared a laboratory and whose project from which mine was derived, suddenly moved out of the lab one day saying that she believed I was "stealing" her work.

AAPP was an integral part of my decision and ability to maintain my dignity and keep pressing forward despite these enormous challenges. As my eyes filled with tears from the sting of the words of that graduate director, I was encouraged by having an ally in the department in my AAPP Faculty Mentor, Dr. Michael Matthews. So, I quickly decided that I would not give that graduate director the pleasure of seeing me cry or reporting my

reaction to “some people,” and I quickly changed the subject to move the conversation to a close. Whenever I felt alone and uncomfortably different among my chemical engineering classmates, I found solace in having colleagues in the other AAPP Scholars on campus. I was empowered to use my experiences to encourage and mentor my new undergraduate classmates just as fellow AAPP Scholars Tjuan Dogan, Phyllis Sanders, and Phyllis Perkins had done to help me settle into the university and surrounding community. Even when faced with the challenge of a derailed research collaboration, I was able to persevere remembering some of the stories that AAPP distinguished guest, Dr. Howard Adams, a leading expert in mentoring and mentorship programs and Founder and President of H.G. Adams & Associates, Inc., shared about his daughter’s engineering journey.

Although I was a 2003 PhD graduate in Chemical Engineering and the *first African American female to receive a PhD in Engineering*, AAPP continues to be an important part of my life. I am continually uplifted by the “Good News” e-mails that Rhittie Gettone sends periodically to celebrate the professional accomplishments of current scholars and alumni. Dr. Howard Adams’ daughter whom I mentioned earlier, Dr. Stephanie Adams, now Dean of the Batten College of Engineering & Technology at Old Dominion University, and I connected and found common interest in the scholarship of teaching and learning engineering. Previously, as Chairperson of the Department of Engineering Education at Virginia Tech, she wrote a powerful letter of support for my promotion portfolio. Another advantage is that I have a folder of notes and handouts from AAPP workshops and experiences in my office as a ready reference to important

lessons learned. For example, I recently pulled a handout from The Compact for Faculty Diversity Institute on Teaching and Mentoring that I attended as an AAPP Scholar. The notes from the session on creating collaborative learning environments to promote active student learning included study group productivity and assessment worksheets that I will use with my current students. On a personal note, my children and those of fellow AAPP Alumna Melicia Whitt-Glover attend the same school, and it has been nice to connect with her on issues surrounding their educational experiences.

I am forever grateful for the African American Professors Program and so pleased to have seen its legacy sustained by former Director and Distinguished Professor Emeritus, Dr. Leonard O. Pellicer; current Director and The Benjamin Elijah Mays Distinguished Professor Emeritus, Dr. John McFadden; devoted Administrative Coordinator, Mrs. Rhittie Gettone; sponsorship of the University of South Carolina Office of the Provost; and the personal and professional networks formed through involvement in the program. Finally, that legacy can be seen in the published works of current and past scholars and faculty mentors in the Monograph Series.

Congratulations to the authors in this 2016 Monograph and the work they are continuing to do. I look forward to hearing the stories of great works resulting from the information and inspiration gained in reading this latest edition of the Monograph Series.

Sirena Hargrove-Leak, Ph.D., AAPP Alumna, 2003

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PREFACE

The African American Professors Program (AAPP) at the University of South Carolina is honored to publish this fifteenth edition of its annual monograph series. AAPP recognizes the significance of offering scholars a venue through which to engage actively in research and to publish their refereed papers. Parallel with the publication of their manuscripts is the opportunity to gain visibility among colleagues throughout postsecondary institutions at national and international levels.

Scholars who have contributed papers for this monograph are acknowledged for embracing the value of including this responsibility within their academic milieu. Writing across disciplines adds to the intellectual diversity of these manuscripts. From neophytes to quite experienced individuals, the chapters have been researched and written in depth.

Founded in 1997 through the Department of Educational Leadership and Policies in the College of Education, AAPP was designed originally to address the under-representation of African American professors on college and university campuses. Its mission is to expand the pool of these professors in critical academic and research areas. Sponsored historically by the University of South Carolina, the W. K. Kellogg Foundation, and the South Carolina General Assembly, the program recruits doctoral students for disciplines in which African Americans currently are underrepresented among faculty in higher education.

The continuation of this monograph series is seen as responding to a window of opportunity to be sensitive to an academic expectation of graduates as they pursue career placement and, at the same time, to allow for the dissemination of products of scholarship to a broader community. The importance of this series has been voiced by one of our 2002 AAPP graduates, Dr. Shundelle LaTjuan Dogan, formerly an Administrative Fellow at Harvard University, a Program Officer for the Southern Education Foundation, and a Program Officer for the Arthur M. Blank Foundation in Atlanta, Georgia. She is currently a Corporate Citizenship and Corporate Affairs Manager for IBM-International Business Machines in Atlanta, Georgia, and she wrote the monograph Foreword in 2014.

Dr. Dogan wrote: *“One thing in particular that I want to thank you for is having the African American Professors Program scholars publish articles for the monograph. I have to admit that writing the articles seemed like extra work at the time. However, in my recent interview process, organizations have asked me for samples of my writing. Including an article from a published monograph helped to make my portfolio much more impressive. You were ‘right on target’ in having us do the monograph series”* (AAPP 2003 Monograph, p. xi).

The African American Professors Program advances the tradition as a promoter of international scholarship in higher education evidenced through the inspiration from this group of interdisciplinary manuscripts. I hope that you will envision these published papers to serve as an invaluable

contribution to your own professional development and career enhancement.

John McFadden, PhD

*The Benjamin Elijah Mays Distinguished Professor Emeritus
Director, African American Professors Program
University of South Carolina*



**PART 1:
ARNOLD SCHOOL OF
PUBLIC HEALTH**

THE SISTAS INSPIRING SISTAS THROUGH ACTIVITY AND SUPPORT (SISTAS) RESEARCH STUDY: A PRELIMINARY REPORT

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Breast cancer (BrCa) mortality exhibits racial disparities across this country. According to the recent National Report to the Nation on the Status of Cancer, 1975-2011, though their disease incidence is lower than that of European-American (EA) women, African-American (AA) women die at a much higher rate [1]. Their death rate, 30.6 deaths per 100,000 women from 2002-2011, is about 50% higher than that of EA women. One of the most alarming health disparities in South Carolina (SC) is associated with increased BrCa mortality rates among AA women [2-3]. Despite about 15% lower incidence rates in AA women, mortality is about 60% higher per unit of incidence [4]. Lifestyle changes such as increasing physical activity and implementing a healthy diet (e.g., increasing fruits and vegetables intake) have been shown to reduce the risk of various comorbidities [5-7] as well as BrCa incidence [8-11]. Community involvement has been a staple among AA in terms of addressing various health issues. Research also has shown that the effectiveness of group-based interventions may be significant in creating large changes in a multitude of health outcomes [12-15].

The purpose of this monograph chapter is to describe the development and implementation of the Sistas Inspiring Sistas Through Activity and Support (SISTAS) research study. SISTAS is a community-based participatory research (CBPR) project aimed at promoting physical activity and healthy diet among overweight and obese AA women in SC. The overall goal is to reduce BrCa risk in AA women.

METHODS

Study Aims

The primary aims of the study were: (a) to conduct a regionally based, community-designed dietary and physical activity behavioral controlled trial among AA women using a CBPR approach, (b) to assess the effectiveness of the controlled trial on improving chronic inflammation as measured by plasma biomarkers, and (c) to assess the effectiveness of the controlled trial on decreasing breast density. The study protocol was approved by the Institutional Review Board at the University of South Carolina on February 2, 2011.

The Community Networks Program Centers

The National Cancer Institute's (NCI, Bethesda, MD) Community Networks Program Centers (CNPC) consists of 23 centers whose main purpose is to deliver intervention research to improve cancer health disparities [16]. The CBPR approach is utilized among these NCI centers to engage key community stakeholders in order to achieve the common goal of improving health outcomes. The centers, mostly located at academic institutions, also place great emphasis on training new researchers to create broad-based understanding of the use of CBPR-based approaches.

Setting and Population

The SISTAS intervention and clinic visits took place in two distinct locations (i.e., rural and metropolitan) within SC. SC has a large rural population compared to the United States (U.S.), with 33.7% of the

population living in rural counties in 2010 [17]. A substantial percentage of adult residents in specific rural areas are AA [18], and they are constituents of a district that depicts a health disparity between AA and EA women in BrCa mortality-to-incidence ratios (MIR). Compared to their EA counterparts, AA women had greater than 20% BrCa MIR in that precise region [4].

The major metropolitan region (Columbia) in SC includes a considerable proportion of AA adults [19] and its lower (i.e., Southern) half is both rural and predominantly AA [20]. Despite the fact that the AA population consists of a large percentage of rural residents; there are still disparities among AA who are uninsured and residing in remote rural areas when compared to Whites (33.8% vs. 16.9%, respectively) [21]. Also, the metropolitan area being studied falls under one of the health districts that shows a disparity between AA and EA women in the BrCa MIR. The BrCa mortality of AA women in this region also is >20% compared to the national statistics for EA women [4]. This evidence underlines our rationale for engaging people living in both rural and metropolitan areas of SC to participate in this study.

Approach to Partnership/Recruitment

Formation of Advisory Panels

The SISTAS Project Leader and Project Coordinator identified key stake holders in the Florence community and scheduled meetings to discuss the research project and specific needs of the community. Meetings were

held with the state health department, local medical centers providing mammography services to these specific areas, parks and recreations departments, as well as various businesses and church affiliates. It was through these meetings that ways were identified to effectively market the Regional Coordinator and Program Assistant positions (Personal Communication from Hiluv Johnson, Project Coordinator, January 20, 2011).

Recruitment of Participants

SISTAS personnel attended church health fairs, church services, Bible studies, community health fairs, local libraries, and social events for recruitment purposes. Partnerships also were formed with several churches and a community park to use their facilities to offer the interventions and to conduct clinics for little to no cost. These partnerships were established with Levi Park, Cumberland United Methodist Church, Trinity Baptist Church, Mt. Zion AME Church, Monumental Baptist Church, and Majority Missionary Baptist Church (Personal communication, Johnson, 2011). These partnerships critiqued and made edits to all assessment packets, the intervention material, and the study name and logo. They also helped in the interview process.

In September 2013, the first intervention wave (i.e., structured classroom sessions) was held in the metropolitan area. Prior to doing so, relationships with community leaders in the county were initiated to form various partnerships for successful recruiting in the region. Partnerships

were formed and recruitment was conducted in the metropolitan area the same way as was done in the rural area (Personal communication, Johnson, August, 2013).

Inclusion and Exclusion Criteria

Women were eligible to participate in the study if they were AA, 30 years of age or older, had a body mass index (BMI) of 30 kg/m² or more, had no previous cancer diagnosis (except non-melanoma skin cancer) and had no inflammatory-related diseases (e.g., lupus, rheumatoid arthritis) (Personal communication, Johnson, 2013). In addition, they needed to be physically able to exercise or walk and to be willing to be randomized and to participate fully in the research study for one calendar year.

Intervention

The SISTAS intervention held eight waves in the rural region of SC and three waves in the designated metropolitan area (Columbia) of SC. Randomization occurred immediately after the baseline clinic visit. Women randomized to the immediate intervention research group received the twelve weekly classroom sessions (i.e., consisting of exercise regimes, emphasis on consuming whole foods and cooking demonstrations) and educational binders (Table 1, see Appendix A). The second clinic visit took place after three months of weekly sessions that were followed by nine monthly booster sessions, which contained additional exercise modules and cooking classes (Table 2, see Appendix A).

Data Collection Methods

All potential participants who contacted the study staff (e.g., in person, via telephone or electronically) were screened to assess eligibility, added to the tracking database, and assigned a study identification number. General demographic information was entered into the SISTAS database. Information on active participants included completion of clinic visits, class attendance, all communication attempts, and their outcomes during the course of the study. This database was hosted on a secure server in a separate folder, and only a few designated personnel had access to the database to ensure security and confidentiality of participants' information (Personal communication, Johnson, 2013).

Measures for Data Collection

Data were collected at three different time points. Participants were scheduled for clinic appointments immediately before and after the 12-week intervention and at the end of one year. Clinics were held at the local churches and academic centers; these corresponded to the locations where intervention classes were conducted for each wave. Participants who could not attend follow-up clinic visits after the start of their participation in the SISTAS program were contacted by study personnel to hold make-up clinics, to obtain blood samples and to gather pertinent information. At all three clinic visits (i.e., baseline, 3-month, and 1 year) questionnaire data were obtained, anthropometric measurements were taken, and blood

samples were drawn. For the current analysis, only measures at baseline were utilized.

Questionnaire-derived Data

Prior to the clinic visit, participants were mailed questionnaire packets; see Table 3 below for questionnaires included at baseline, 3-month,

Table 3. *Questionnaires for Data Collection at Baseline, 3-Month, and 1-Year Follow-up.*

Questionnaire	Baseline	3-Month Follow-up	1-year Follow-up
Health & Lifestyle Center for Epidemiologic Studies Depression Scale (CESD-10)	X	X	X
Everyday Discrimination Scale	X		
Perceived Stress Scale	X	X	X
Pittsburgh Sleep Quality Index	X	X	X
Self Efficacy for Diet	X	X	X
Self Efficacy for Exercise	X	X	X
Social Support	X		
Social Support and Eating Habits/Exercise	X	X	X
The Health Care Systems distrust scale	X		
Racial Pride Scale (urban AA women)	X		
Demographics	X		

and the one-year follow up date. Participants brought completed questionnaires to the clinic where they were reviewed for completeness and accuracy.

Data Collected in Clinics

All blood pressure and anthropometric measurements, including height, hip circumference, waist circumference, weight and percent body fat (including fat mass and fat free mass) were taken during the clinic visits by trained study staff who followed standardized data-collection protocols established in earlier research [22]. Height was measured at baseline, utilizing a stadiometer (measured to the nearest 0.25 inch). Weight (to the nearest 0.1 lb.), percent body fat (to the nearest 0.1%), and fat mass/fat free mass (to the nearest 0.1 lb.) were measured using a portable Digital TBF-310GS Body Composition Analyzer (SECA, Hamburg, Germany) floor scale. Women were asked to take off their shoes and socks before either height or weight was measured; they also were asked not to wear stocking to the clinic visits. BMI was calculated as weight (kg.) divided by height squared (m^2). Blood pressure (systolic and diastolic) was taken on the dominant arm with a ReliOn automatic Blood Pressure Monitor[®] (HEM-741CREL; Omron Electronics-Americas, Hoffman Estates, IL) after sitting for one minute.

Hip circumference was measured by locating the widest part of the buttocks, and any clothing was smoothed against the skin to get as accurate a measurement as possible. Waist circumference was measured by finding the narrowest part of the torso, which is the area between the woman's ribs and iliac crest. One observation each was taken for weight, BMI, fat percent, fat mass and fat free mass on each participant at each clinic visit.

There were two measurements taken for hip/waist circumference and blood pressure on each participant at each clinic visit. Measurements received were used in the statistical analyses of the data for the study.

Dietary Data

Estimates of energy, nutrient, and food group intakes were derived from a self-report of food consumption. This information was collected using a single, telephone-administered, 24-hour dietary recall interview (24HR). Although this method is not devoid of measurement error, it is considered an imperfect “gold standard” for estimating dietary intake [23] in a nutrition intervention. Though a single 24HR is not adequate to characterize dietary intake on the individual level, it can be used to calculate group-level mean intake [24] and, using standard statistical techniques, to compute percentiles of the distribution [25]. The Nutrient Data System for Research software (NDSR; current version), licensed from the Nutrition Coordinating Center (NCC) at the University of Minnesota (Minneapolis, MN), was utilized to conduct the dietary interviews. NDSR is considered the state-of-the-art research software for conducting analyses of 24HR data [26]. Its food database includes over 19,000 foods, is updated yearly, and provides nutrient composition information for over 120 nutrients. The quality of 24HR data depends both on the ability of the subject to remember which foods were consumed [26] as well as the on the skill of the interviewer in eliciting complete and accurate information. In this study, the 24 HRs were collected by a team of experienced (i.e., >6 years of using

NDSR) registered dietitians specifically trained in using the NCC protocol. This protocol employs the multipass approach, which utilizes prompting to reduce omissions and to standardize the interview methodology across interviewers [27]. Portion estimation by the participant is facilitated with the use of a validated, 2-dimensional, food portion visual (FPV) that is an integral part of the NDSR software [28] and which has been used successfully in multiple studies of adults and adolescents [29].

Prior to data collection, study participants underwent a brief training (10–15 min) on how to use the FPV to estimate portion sizes of commonly eaten foods. The training incorporates life-sized plates, glasses and utensils and food models in a hands-on experiential interchange [30]. Interviews were assigned on a randomly-selected day, and “cold” calls (i.e., calls made without prior notice) were made to each study subject to minimize preparation/rehearsing that could bias participants’ recall [31]. The sampling window was set at 14 days to be adequately large to allow multiple attempts on multiple days to optimize the likelihood of completing an interview.

Calculation of the dietary inflammatory index (DII) has been described previously [32]. Micro and macronutrient values (known as food parameters) derived from the 24HR were assigned inflammatory article scores based on research summarizing findings from 1,943 articles [32]. These food parameters were divided by energy intake and multiplied by 1,000 to create values per 1,000 kilocalories to account for different energy

intakes between participants. This DII calculation is linked to a regionally representative world database (i.e., food consumption from 11 populations around the world) that provided a mean and standard deviation for each food parameter per 1,000 calories consumed. A z-score was created by subtracting the “standard mean” from the actual intake and dividing by its standard deviation. This z-score is then converted to a percentile (in order to minimize the effect of outliers or right-skewing) and centered by doubling the value and subtracting 1. The product for each food parameter and adjusted article score was calculated and then summed across all food parameters to create each participant’s DII score, which is a calculation protocol used previously in other nutritional studies [e.g., 38]. More positive DII scores represent more pro-inflammatory diets; more negative values are indicative of a more anti-inflammatory diet [32].

Physical Activity Data

A previous-day recall (PDR) was used to collect information on physical activity. This instrument was validated as a measure of physical activity and sedentary behaviors [33]. Interviews were conducted by the dietitians who conducted the 24HR dietary information and who also were trained to complete the PDR, using a standardized protocol. In brief, interviewers led participants chronologically through the previous day (i.e., midnight to midnight), using a semi-structured interview protocol. Information was gathered about specific active and sedentary behaviors reported in three segments of the previous day (i.e., morning, afternoon, and

evening). Individual behaviors lasting at least 5 minutes in a given period were recorded and coded, and the duration of the activities was entered directly into a database. Each behavior reported, in accordance with recommended procedures, was coded as either physically active or sedentary, using reported body position or activity type. Sedentary behaviors were defined as any behavior that was performed while sitting, reclining, or lying down during the waking day and that did not require substantial energy [33]. All other activities were considered physically active. These data were summed across all individual sedentary and active behaviors that were reported based on estimates of the duration of the activity, which are labeled as the metabolic equivalent of task (MET). Time also was summarized into 3 categories: Light-intensity (1.5 to less than 3 METs), moderate-intensity (3 to less than 6 METs), and vigorous intensity (6+ METs).

Laboratory-derived Data

Blood samples from all eligible participants were collected during clinic visits to analyze inflammatory markers [C-reactive protein (CRP), interleukin 6 (IL-6), monocyte chemotactic protein 1 (MCP-1), and HbA1c percentage]. Details about blood handling, analyzing protocols, and procedures have been described elsewhere [23]. Examination of breast density among mammography-eligible women (≥ 40 years old) will occur at a later date.

Retention of Participants

During the initial recruitment as well as at the baseline measurement, contact information was collected from the participants. Follow-up reminder calls were made to participants scheduled for interventions two days prior to the sessions, and all participants were contacted multiple times for the clinic visits. All participants were sent monthly incentives (i.e., appreciation gifts) through the mail at various intervals throughout the duration of their participation. These gifts were not related to diet or physical activity (Personal communication, Johnson, 2013). In addition, intervention participants were given certificates at the end of the 12-weekly session period, and those with perfect attendance were entered into a drawing for a monetary gift. All participants received a \$50 incentive for attending all three clinics (Personal communication, Johnson, 2013).

Statistical Analyses

Descriptive statistics were computed using frequencies or means \pm standard deviations. Chi square and t-tests were used to test for baseline differences between treatment groups. The primary statistical method consists of repeated measures regression analyses to assess the effect of the intervention with the biological markers of inflammation (CRP, IL-6, IL-1RA IL-10 and IL-8), which serve as the dependent variables for the analyses. Subjects had three measures for each biomarker (i.e., measured at baseline, twelve weeks and 1 year). The repeated measures analysis employs mixed-models, which allow designation of both fixed and random

effects [e.g., 30]. The primary model fits the treatment group and the treatment-by-time interaction term as fixed effects, while subject and intervention condition were fit as random effects. To account for the interdependence of multiple measures of the same marker, at the time of final analysis each longitudinal datum was split into two variables; one for the constant (within-subject) baseline values (which should all be similar because no intervention has yet taken place) and another for the varying (within-subject) remaining time-ordered values. The variable containing the baseline values represents the exposure for each model. Potentially confounding variables or effect modifiers (e.g., smoking, marital status, educational status) also were included in the covariate list in all models.

RESULTS

Baseline demographic characteristics of the participants are presented in Table 4 (See Appendix B). Based on these data, women in this trial tended to be middle-aged, married, have some college education, be employed full-time, have Medicare as primary insurance, be non-smokers, and have perceived their personal health as good. As shown in Table 5 below, on average, the women were pre-hypertensive at baseline (i.e., systolic blood pressure = 133.9; diastolic blood pressure = 84.0) and morbidly obese (i.e., mean body mass index [BMI kg/m²] = 39.0); the mean fat mass and fat-free mass was 106.4 and 121.0, respectively. The mean DII (2.15 ± 2.17) indicated that the participants consume a relatively pro-inflammatory diet;

however, it should be noted that about 41% of this population had negative values, which are more indicative of anti-inflammatory diets at baseline.

Table 5. *Demographics of Study Population’s Physical Health Characteristics at Baseline*

Characteristic	Mean ± STD (n = 337)
Body Mass Index	39.0 ± 7.4
Waist to Hip Ratio	0.87 ± 0.07
Fat Mass	106.4 ± 32.1
Fat Free Mass	121.0 ± 18.3
Systolic Blood Pressure	133.9 ± 21.9
Diastolic Blood Pressure	84.0 ± 13.7
Dietary Inflammatory Index (DII)	2.15 ± 2.17

DISCUSSION

A population of AA women with high BMI values were recruited to provide a physical activity and diet intervention in rural and urban SC. Overall, the women in the study were found to be morbidly obese, pre-hypertensive, and had a pro-inflammatory diet. Although DII values were indicative of more pro-inflammatory diets, about 41% of the population had scores indicating more anti-inflammatory diets. This novel dietary tool has distinct advantages over other dietary measures, in that it was based on

peer-reviewed literature focusing on a specific outcome (i.e., inflammation) and is standardized to world intake values [32].

The DII has been found to be associated with inflammatory biomarkers including CRP and IL-6 [34-36], increased odds of asthma and reduced forced expiratory volume (FEV1), employment shiftwork, the glucose-intolerance component of metabolic syndrome among police officers, anthropometric measurements, cardiovascular disease incidence, and colorectal, prostate, and pancreatic cancer risk in numerous studies [34, 36-45]. Future analyses using SISTAS data will examine changes in the DII after the intervention when compared to baseline values and whether these changes in the DII correspond to healthier inflammation levels.

Somewhat high BMI values were expected because AA women in SC have higher rates of obesity compared to the national average; however, the participant baseline values were extraordinarily high. The average blood pressure measurements were consistent with being pre-hypertensive based on the American Heart Association guidelines, and this also was confirmed by some of the medications the women were taking.

Collaborations between AA communities and universities are vital in delivering culturally-appropriate health promotion messages that can reach the intended audience effectively. Numerous CBPR-based clinical trials have targeted AA men and women, regarding specific outcomes [46-49] that include assessment of cancer risk knowledge [50] and reduction of cancer risk [51]. Statistically significant increases in colorectal cancer

knowledge was shown in one study [46], while statistically significant decreases in weight, BMI, and percent body fat occurred among participants recruited from five churches [49]. Only two studies used the CBPR approach to direct a BrCa prevention intervention among AA women [52-53].

Despite adhering to the principles of CBPR in these university-community collaborations, limitations exist on which the SISTAS program will attempt to focus. In the last decade, the majority of studies targeted either research for churches [50-51, 54-55], focus groups [56-58], or case studies [59-60]. The SISTAS program utilizes an RCT model as a guide for the intervention catered to AA women. It is clear that most cancer-based CBPR interventions focus on screening for cancer to combat health disparities [61-64], promotion of general health overall [65], or participation rates among African Americans [66-67]. Studies seldom are found with a CBPR framework that implement diet and exercise collectively to reduce the risk of biomarkers associated with chronic diseases. A project that promotes increased physical activity as well as proper consumption of fruits, vegetables, and whole grains could more than likely have a large impact on reducing the risk of BrCa.

CONCLUSIONS

Among diet and physical activity interventions geared towards the AA female population, it is rare that the structure of CBPR has been used in those projects that seek to ultimately reduce BrCa risk; therefore, the chance

that the women in this community of participants would retain the lessons learned past the study period seems less likely to occur on account of a dearth of resources available to them. This can lead to reverting to lifestyles lived before changes were made while participating in the intervention.

Despite the shortage in literature in regard to CBPR interventions that target AA women, the SISTAS program addresses the gaps in research such as implementing diet and physical activity in CBPR-based studies to decrease BrCa risk. Recruitment and retention plans as well as process evaluation were incorporated from the inception of the program to help determine both the program's potential success and issues of concern, respectively. Future projects in BrCa, as well as in the prevalence of chronic diseases, call for epidemiologists to consider utilizing the CBPR approach for administering clinical trials to underrepresented and underserved populations.

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Appendix A: Intervention Protocols

Table 1. *Content and activities of 12-Weekly Intervention Sessions*

Week	Education Session	Activity
1	SISTAS Overview	Physical Activity
2	Health Disparities; Anti-Inflammatory Foods; Types of Exercise	Food & PA Log; Self-monitoring/SMART Goals; Cooking Demonstration
3	Physical Activity Basics; SMART Goals; Healthy Protein	Group Walk
4	Nutrition Basics	Food Label Demonstration; Cooking Demonstration
5	Empowerment; Strength Training; Review Logs; Eating Out	Review Food & PA Logs; Healthy Snacking
6	Changing Recipes; Cooking Demonstration; Hot & Cold Weather Exercising	Cooking Demonstration;
7	Stages of Change; Support and Overcoming Barriers; Group Aerobic Training; Dining Out	Review Food & PA Logs; Group Choice Physical Activity
8	Menu Planning; Portion Distortion	Menu Planning
9	Burning Calories w/ Physical Activity	Review Food & PA Logs; Group Activity Strength Training Jeopardy Game
10	Program Adherence	Cooking Demonstration
11	Stress Management	Massages Group Aerobic Activity
12	Planning for Lapses	Healthy Pot Luck

Table 2. *Topics and Activities of 9 Booster Sessions*

Month	Topic	Activity
1	Program Refresher	Discussion on Best Practices
2	Grocery Store Tour	Guided Tour
3	Mindful Eating	Aerobic Exercise
4	Selecting Exercise Equipment	Resistance Bands Exercise
5	Smart Snacking	Strength and Balance Exercises
6	Preventing Strains	Guest Speaker
7	Planning for Success	Menu & Meal Planning
8	Healthy Grocery Savings	Tips on Vegetarian Diet
9	Sustaining Lifestyle Change	Healthy Pot Luck

APPENDIX B: Descriptive Statistics

Table 4. *Demographics of Study Population Personal Characteristics at Baseline*

Characteristic	Frequency (%) or Mean \pm STD (n = 337)
Age:	48 \pm 11.0
Marital Status:	
Married	126 (37.0%)
Living w/partner	9 (2.7%)
Widowed	19 (5.7%)
Divorced	64 (19.0%)
Separated	28 (8.3%)
Single, never married	91 (27.0%)
Education Status:	
High school or less	70 (20.7%)
Some college	142 (42.1%)
Complete college	59 (17.5%)
Postgraduate	66 (19.6%)
Employment Status:	
Full time	183 (54.3%)
Part time	38 (11.3%)
Retired	62 (18.4%)
Not employed	54 (16.0%)
Smoking Status:	
Yes	109 (32.8%)
No	223 (67.2%)
Perceived Health:	
Excellent	9 (2.7%)
Very Good	87 (26.1%)
Good	182 (54.6%)
Fair	50 (15.0%)
Poor	5 (1.5%)
Insurance:	
Medicare	139 (41.9%)
Medicaid	44 (13.3%)
Private	22 (6.6%)
Uninsured/Self pay	61 (18.4%)
Other	66 (19.9%)

*Column percentages may not equal 100% due to rounding differences.
Frequencies may not equal population total due to missing data.*



**PART 2:
COLLEGE OF ARTS
AND SCIENCES**

AFRICAN AMERICAN ENGLISH (AAE) AND MALE SPEECH: THE MANAGEMENT AND MITIGATION OF MASCULINITY

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Department of English

The use of speech to perform one's social identity is not an uncommon phenomenon and has been the subject of study within Sociolinguistics for decades (Malinowski, 1997; Wortham, 2003). Researchers have found that all facets of identity from ethnicity (García-Sánchez, 2013; Heller, 2003; Roth-Gordon, 2007) to geographical location (Stuart-Smith, 2007; Warren, 2005) influence how we speak, and in turn such facets can be enacted throughout a person's speech. The idea of enactment through speech is of great personal interest, particularly with respect to gender. There are several elements of speech that are manipulated in order to signal gender, and many of those used to signal masculinity are linked to ideas of power and dominance (DeFrancisco, 1991; Holmes, 1995; Kiesling, 2002). African-American English (AAE) has been widely associated with young male speakers because, at its onset, the linguistic exploration of AAE was restricted to descriptions of the vernacular speech of young urban/working class males (Fasold, 1972; Labov, 1966, 1972b; Wolfram, 1969) as an attempt to legitimize this speech variety by

demonstrating uniformity and thus systematicity. AAE also has been used frequently in the performance of masculinity by men of varying races (e.g., Bucholtz, 1999; Bucholtz & Lopez, 2011; Chun, 2001). In contrast, when African-American men choose to employ Standard English, they run the risk of culturally being viewed as less masculine, among other criticisms.

This monograph chapter contains an examination of the use of speech by an African-American male named Cola and his representation of masculinity via various discursive elements. The linguistic analysis of his speech is included as a case study of one individual in order to determine the function of language in conversation as a tool of constructing identity, particularly addressing this individual's masculinity.

HISTORIC RELATED LITERATURE

Throughout history African-American men have been given the attribute of being hyper masculine, this term being viewed as the performance of an overly aggressive, physical and sexual persona (Davis, 2006; Hopkinson & Moore, 2006; McCleod, 2009; Staples, 1982). Regardless of today's treatment of Black masculinity, previously these attributes were ascribed to Black men by Europeans based on racial ideologies (Davis, 2006; Staples, 1982). Some claim that these views were the racist assumptions of Europeans who initially had come into contact with Africans (e.g., Staples, 1982), while others claim that this ideology was promoted as a justification for the use of force against people of African descent in order to dominate them as well as to perform acts of

violence against them at will (Royster, 2011). This narrative of the hyper-masculine Black male has been maintained through numerous generations (e.g., Singleton's 1991 movie, *Boyz n the hood*) up until today.

Black men still are associated with violence, criminal activity, lack of conformity and hyper sexuality by “nature” in the public eye (Gray, 1995; Henry, 2004; Hopkinson & Moore, 2006). This portrayal of Black men is not the only narrative represented, but it is one of the most salient ones that frequently is drawn upon by Whites when discussing the negative ideologies concerning Black men (Hooks, 2004; Nedhari, 2009; Thomas, 2014).

This narrative, from various perspectives over many years, has been taken up by both African-Americans and Whites in contemporary American culture. Though the trope of the “angry Black man” may have been created by Europeans and challenged by many (Gray, 1995; Lamm, 2003), a significant amount of African-American men adopted it, particularly within the past twenty years or so, perhaps in association with the rise of Hip-Hop music. This music genre glorified the image of the “thug” or the super-masculine persona that was prescribed to many boys in urban neighborhoods. This masculine figure based his value on respect, often gained from violence or monetary success (usually through ill-gotten means), which Gray (1995) notes as “...romanticization of the original gansta...” (para. 5) in rap music. Just as the “thug” image was embraced by African-Americans, the ideal was established as one of the ultimate forms

of masculinity for non-Blacks as well. Matthew Henry (2004) evaluates and criticizes John Singleton's 2000 remake of the film *Shaft* (*Shaft [The Original]*, Parks, 1971) in which the title character is portrayed as a violent, angry vigilante who acts above the law and reproduces the stereotype of Black men as violent, non-rule abiding citizens. This film was designed to challenge the value placed on the "thug life" and the trope of the ghetto Black man, yet Singleton reproduces that figure later in his portrayal of *Shaft* as well as in his 1991 movie *Boyz n the Hood*. Henry critiques Singleton's portrayal of *Shaft* as hyper-aggressive, which is seen as contradictory and counterproductive to his intent.

Bucholtz (1999), Bucholtz and Lopez (2011) and Chun (2001) demonstrate how non-African American men draw on the association of Black men as a source of hyper masculinity in order to perform their own masculinity through linguistic crossing (i.e., not using language associated with one's ethnic group; Rampton, 1995) into adaptations of aspects of Black culture. Bucholtz and Lopez (2011) specifically address this phenomenon as minstrelsy as it was performed in Hollywood films. They evaluate the films "Bringin' down the House" (Shankman, 2003) and "Bulworth" (Beatty, 1998) and the white lead actors' use of AAE and "Black" mannerisms in order to perform their masculine personae. In these films, Steve Martin and Warren Beatty respectively are observed adopting a type of "Blackness" as they evolve from lame white guys to "down" figures

through rap, the use of AAE, Hip-Hop clothing and participation in varying speech events.

The linguistic crossing performed by these men relied heavily on the use of African American Vernacular English (AAVE) as it was associated greatly with young urban males. By drawing on varying features from this speech variety, men who were White (Bucholtz, 1999; Bucholtz & Lopez, 2011) and Asian (Chun, 2001) enacted what they viewed as more masculine personae. In order to maintain continuity for the sake of analysis, linguists focused solely on one type of AAE: that of young, urban males through what is labeled strategic essentialism (Bucholtz, 2003). This focus led to the association of AAE with said young urban men and, consequently, with the stereotype of hyper masculinity. As a result, men (both Black and White) frequently drew from this speech variety in order to perform a tough persona that commands some kind of respect.

Much research has been dedicated to the construction and performance of gender through language over many years. Linguists have evaluated the use of language by both males and females and the linguistic features that are said to present in conversation. More than 40 years ago, Robin Lakoff (1975) justified the differences between the speech of men and women with the claim that they culturally were indoctrinated to use different language forms through some specifics of their upbringing. She specifically focused on the language of women and listed various elements that she attributed to women's speech including: (a) Specific lexical items

related to activities marked as feminine, (b) empty adjectives such as “divine,” and (c) final rising intonation of declarative sentences (in order to mitigate the force of statements by making them sound like questions) as well as (d) the use of various hedges, the intensive “so,” hypercorrect grammar, and super polite forms of speech. It is Lakoff’s claim that women’s upbringing instructed them to speak gently, avoiding any appearance of roughness. A few years later O’Barr and Atkins (1980) asserted that this approach is a method of giving away power in speech and that men of somewhat low-social standing perform the same acts. The association of power with gender, however, would construct a system of prescription that would claim that men do not need to adhere to any of these rules in speech. Instead, men were allowed to dominate conversations and only took up topics of their choosing (DeFrancisco, 1991); they also used elements like compliments to exert power not only over other men but over women as well (Holmes, 1995).

In terms of performing masculinity (with respect to sexuality), Scott Kiesling (2002) analyzed how a group of fraternity members performed masculinity via power and dominance through their treatments of other men (i.e., gay and straight) and of women. Through discourses that focus on sex (as a marker of masculinity) and interactions with fraternity members of relatively low standing, the men enact and exert dominance through sexist address terms that simultaneously subjugate other frat members and women. Kiesling notes that these men are not using language merely to

reflect a system of inequality, which places hegemonic masculinity as dominant, but they also are reproducing these systems, exerting their own dominance based largely on gender and heterosexuality.

Deborah Cameron (1997, 2003), more than a decade ago, explored the construction of masculinity via speech by focusing on the performative aspect of language. As gender is performed, so is masculinity, and she analyzed how this was enacted via the conversation of a group of college boys who overtly and covertly prescribe how to perform masculinity through their evaluation of other males. They position themselves and their masculinity in terms of men who do not live up to their prescriptions (i.e., gay men) and women through their use of gossip. Typically, gossip has been viewed as a women's activity (1997), Cameron's evaluation challenges the hegemonic discussion of how men speak and complicates how they perform masculinity through their speech.

Similarly, Jennifer Coates (2001) also complicated the notion of the performance of masculinity through her analysis of conversational narratives shared between men in friendly talk. As she acknowledged the efforts to reproduce a hegemonic ideal of masculinity, she also introduced similar efforts by the men in her study to express some type of vulnerability. While these attempts, more than 15 years ago, both to express masculinity and to remove the "mask" that is placed upon men by hegemonic prescriptions of male-hood were dominated by the typical reconstructions of masculine behavior, Coates made it clear that these

efforts (however small) should not be ignored because they make room for the complication and expansion of the idea of male identity as it is enacted through speech.

Language and Power

While many may argue for cultural differences as a justification for the variation in the speech between men and women, several scholars have focused their attention on the power dynamics that are inherent and expressed via language. More than 30 years ago, the treatment of language as a mechanism of power was discussed in O’Barr and Atkins (1980) where the authors argued that what traditionally has been viewed as women’s language is actually the language of the powerless. Given that women had historically been in positions of powerlessness due to a sexist society, language that relinquishes power was viewed as being performed by them, but this does not make powerless language an exclusively female phenomenon by default.

Decades ago, O’Barr and Atkins claimed that men as well as women may enact powerless language, and through their observations they attempted to show that the men who do perform said speech do so as members of lower social-standing groups. This, in turn, indicated that such powerless language is more of a reflection of one’s social standing instead of just an enactment of gender. Contrastively, in that same time frame, Candace West (1984) maintained this association of power with language, but through her research with doctors and patients, she found that regardless

of social standing, men attempted to exert power through dominating speech such as conversation interruptions. In her evaluation of several interactions between doctors and patients of both genders, she found that male doctors interrupted patients vastly more than female doctors, and the same rang true for male patients (specifically interrupting when in interactions with female doctors). This approach demonstrated the use of language not just as a reflection of social standing but also as a means of exerting and reproducing power in alignment with gender or masculinity.

A few years later, Deborah Tannen (1990) claimed that men and women talk with different purposes and that those of men are to create a situation of imbalance, dominance, and independence with respect to interlocutors. This motivation to enact power via speech was approached not only from the actual articulation of utterances but also through the use of silence. Victoria Defrancisco's 1991 study of couples' interactions claimed that through a refusal to take up many topics, men place women in positions where they were either silenced, having their topics of choice ignored altogether, or they were forced to put extra effort into trying to maintain the conversation. This conversational "shitwork" apparently placed the onus of discussions that are of no interest to the males on the women.

While some of the more recent research in language and gender does investigate men's use of language to exert power in conversation (Broadbridge, 2003; Holmes & Meyerhof, 2003), much of the work has

focused on investigating the use of language as power (as a means of complicating and subverting gender) performed via language in hopes of furthering a more nuanced and in depth discussion. In an attempt to examine some aspects of contemporary masculine speech, a case study of a particular Black male who does not ascribe to the long-standing typical expressions of masculinity in speech that were previously discussed was developed. A linguistic analysis of transcripts of the interactions between the female researcher and this Black male are used to illuminate patterns of communication associated with the previous research discussion.

THE STUDY

The sole participant for this project was a young man who chose the pseudonym Cola. He is a native resident of South Carolina, in his mid-thirties and identifies as heterosexual. Though Cola is African-American, he was raised in a largely White suburban environment and does not identify as an included member of the African-American community. He often had expressed frustration in not feeling included in said culture as he does not use African-American English in any way and is not viewed as "acting Black." Other African-Americans' rejection of Cola coincides with his own rejection of the culture and critical evaluations of many aspects of Blackness as they are represented in both daily life and through stereotypical tropes. Cola is a strong advocate of the use of Standard American English as the sole prescriptive way of communicating and as the pathway to success in the corporate arena. This desire for corporate success

is marked in comparison to Cola's current occupation. As he is very large in stature, Cola works as a club bouncer who must present an imposing demeanor in order to maintain order at his place of business. He is charged with the task of appearing aggressive and "fear-inspiring" despite the conflict that maintaining this "aggressive Black man" stereotype has with his philosophy of vulnerability and rejection of the hegemonic prescription concerning masculinity.

The purpose of this analysis is to determine the degree to which characteristics associated with the findings and conclusions of the literature reviewed are supported regarding this subject's verbal expression and perspective. Since Cola does not identify with African American culture and is performing work that is highly congruent with the stereotype of the aggressive Black male, as previously discussed, the analysis will pinpoint how his speech is congruent or incongruent with the relevant literature reviewed.

METHODS

During this researcher's encounter with Cola, we had an open ended discussion about language, race and social positioning that was recorded and later transcribed according to general linguistic methods (see Appendix). The linguistic analysis of this data is based on the above literature and its treatment of language as a means of navigating various social settings, notably perceptions of masculinity, aggression and social positioning. There was no attempt at finding or creating specific linguistic

elements, since the methodological goal of Sociolinguistics is typically to gather the most natural speech possible instead of attempting to manipulate data to fit theory or hypotheses. Once collected, the data were evaluated in search of patterns of use alongside the content of the speaker in order to determine what the speaker was doing with language.

FINDINGS

The findings below illustrate Cola’s unique use of language in conjunction with his metalinguistic views, which point to the use of language to mitigate various situations. They are described in five groupings of linguistic observations. These observations include the subject’s expressed perspective and use or lack of use of AAE in his speech as well as other aspects that include: Masculine features, feminine features, hedges, stuttering, repetitions, and self corrections.

African American English Usage

Cola made it explicitly clear that he did not and never has used African-American English (AAE) because he was not raised to do so and did not grow up in an environment where the use of this variety of speech was highly present or encouraged. His views towards AAE and those who speak it were largely negative. He refers to it as “slang” and aligns its use with negative attributes of “thug people” while simultaneously contrasting it with ideas such as “education” and “success” with which he self-identifies (e.g., Table 1).

Despite Cola’s views towards AAE, he did employ non-standard pronunciation of several words, most notably, nasal fronting in final position (i.e., the fronting of the velar nasal /ŋ/ to its alveolar counterpart /n/ in word final position is described by Rickford [1999] in the pronunciation of a word such as “singing” as [siŋɪn] “singin’.”). Nasal fronting seems to

Table 1. *Cola’s Perspective on AAE and Non-Standard English Use Examples*

Line #	Observations	Analysis
49	I wasn’t allowed to use slang in my household	Contrast
50	y’know	
51	like I wasn’t allowed to wear baggy clothes	association of AAE with negative stereotypes
52	or wear my hat a certain way	
23	he speaks a certain way	allusion to rapper’s use of AAE
24	Um	
25	not to denote his intelligence on any level um	Juxtaposing intelligence with AAE → positioning self in opposition of it
26	because <u>they</u> just don’t look at that	excludes self

be more of a feature of some other non-standard dialect as no other features of AAE were present here. He even stresses the post-vocalic /r/ when he utters “brother and sisters” in order to differentiate his pronunciation and the implied meaning of the use of these terms as neither the AAE pronunciation (i.e., the “absence” of a final /r/ occurring after a vowel also

has been attributed to AAE by Rickford) nor bearing the cultural meaning of “brothas and sistas” as he explains in the discourse that follows the utterance. Additionally, in order to mitigate and soften much of what he says, Cola employs numerous hedges, which is very much a feature that is not employed in “men’s speech” or “powerful speech” according to some linguists (e.g., Lakoff, 1975; O’Barr & Atkins, 1980).

Masculine Features of Speech

In the interview process, it might be presumed that the researcher, as interviewer, would have complete control of the interview (i.e., discussion and overall topics pursued), but this was not necessarily the case regarding this research interview. Because this was not the first meeting with Cola, he was already aware of the issues to be discussed before the interview began. Consequently, he initiated the conversation and spoke continuously without any guidance or prompting. Actually, Cola completely took over and dominated the conversation (i.e., a masculine speech feature; See Table 2 below) until it appeared less like a conversation or even an interview and more like a performance or type of rant. He was incredibly assertive in the expression of his ideas and views.

On several occasions, he was redirected to questions specifically in order to obtain data that would be pertinent to this research, yet Cola’s insistence on maintaining control of the situation made it difficult to introduce additional questions or alternative topics. Despite the fact that this interviewer typically might be associated with power or expertise (e.g., as a

researcher and an academic), frequently difficulties were experienced in attempting carefully to change the subject or to express any type of view without appearing to be offensive. There were not many interruptions, but

Table 2. *Masculine Features of Speech Observed*

Line #	Speaker	Observations
4		y'know you can teach kids to be Carlton Banks
5		or they're gonna become 2 chains (2.0)
6	Inter-viewer	i mean (.) there's a third option?
7		which is like me
8		I was like raised as a hybrid-
9	Cola	-well yeah we all
10		we all are (.)
11		somewhere in between
12		Right
13		from there but
14		but yeah
15		what a lot of people don't understand
16		even about 2 chains is

that largely is due to the researcher's deliberate choice of silence in order to obtain data that had not been influenced by personal opinions and thoughts.

As a result, this interviewer spoke much less than normal in an interactive conversation. It should be noted, however, that when speaking, both participants issued a relatively equal amount of interruptions.

Cola often cut the interviewer off with a counter opinion, explanation or a proposed solution to an interviewer observation (with or without solicitation). There were moments of overlapping speech, in which the interviewer would relent to in order to obtain the data. There also were moments when Cola's speech was interrupted to make a point or to assure that certain questions were answered; however, being female apparently made it difficult in that the interviewer did not want to impose on the conversation or to dominate it.

Feminine Features of Speech

Considering his views towards AAE, it should be expected that Cola exclusively would employ Standard English use throughout his speech. The strict adherence to Standard Grammar and pronunciation (for the most part) can be considered part of feminine speech (Cheshire, 1982; Milroy, 1983; Milroy & Milroy, 1993; Trudgill, 1972) when used by African-American men in contrast with the expectation that they speak AAE, which is associated with masculinity. Barrett (1999) argued that the use of hyper standard pronunciation by Black Drag queens was a means of presenting a feminine element within their performance as it is linked to the ideology that attributes elements such as hyper femininity to proper White women. Barrett draws this association of Standard English with feminine speech

from Robin Lakoff’s (1975) discussion of the speech of women. She provides a list of “women’s speech” features, one of which includes the use of hypercorrect grammar (defined as an overshoot at correction to the point of being incorrect; Labov, 1975) accompanied by the justification that the belief is that “women are not supposed to talk rough” (p. 44).

Table 3 shows aspects of Cola’s verbal expressions that can be categorized as congruent with the Lakoff (1975) “women’s speech” features such as hedges and final rising intonation. As mentioned above, these features were found not only by Lakoff but also by Barrett (1999), and they were used as markers of politeness and femininity as they were employed

Table 3. *Feminine Features of Cola’s Speech*

Line #	Observations
42	y’know?
43	but it’s one of those things where (.)
44	even even within our culture
45	there are people who are well educated
46	y’know
47	and everybody kinda picks on Diddy for dropping outta Howard
48	but it’s like (.)
49	Didn’t he get into Howard first?
50	it’s like (.) it’s interesting
51	y’know

primarily by women to mitigate the force of their speech in order to avoid coming off as too masculine.

Hedges in Verbal Expression

Along with the hyper-correct grammar in Lakoff’s (1975) list of features of women’s speech, is the use of expressions called hedges (i.e., words and phrases designed to soften the impact of speech; Levinson, 1983), which can be a means of mitigating the force of one’s statements. This was the most salient feminine feature presented by Cola, as it was practically ubiquitous throughout the interview. During our conversation of over an hour, 65 instances of y’know were counted, as well as 2 of “well” and 5 “kinda”s (See Table 4). Cola’s superfluous amount of hedges could

Table 4. *Frequency Count of Cola’s Hedges and Pauses*

Frequencies for:	Y’know	Well	Kinda	Pauses
Cola’s use	65	2	5	59

be attributed to a motivation to mitigate the force of his statements given the gender differences in this interview situation, and perhaps he had a potential aversion to appearing overly aggressive or threatening. It should be acknowledged that there were moments when Cola seemed to be soliciting the researcher’s endorsement with some of his statements by using “y’know,” but these moments were few and far between, perhaps due to the

interviewer’s consistent employment of positive minimal responses (e.g., “mhm,” “yeah,” etc.) as a means of encouragement for the discussion.

Also, it should be noted that the use of “y’know” was not designed to solicit actual comprehension or a response, since no clarifying discourse followed these hedges (See Table 5). This category of speech always

Table 5. *Cola’s Use of Hedges in Speech*

Line #	Observations
235	but if he was if he was uh
236	y'know Middle Eastern he'd be a = terrorist
237	= right
238	if he was y'know Black, he'd be a thug
253	they were, they were respectable
254	y'know I -I don't know, I'll say Muslim
255	I don't know exactly what they were
256	college students
257	um hum
258	y'know and that's just how
259	y'know I looked at it
260	they were respectable young college students
261	they were just tryna make their way
262	they were just tryna t- t- to achieve their level of success

occurred between statements, and Cola never veered from the topic to explain what he intended before continuing, indicating an assumption that the interviewer understood exactly what he meant or at least had a working comprehension of his intent.

Frequently, Cola's hedges appeared either directly before or after statements that could have been viewed either as potentially offensive or "face threatening" (a concept discussed by Brown & Levinson, 1987). Cola uses hedges as well as careful speech (presumably because he is aware of how his statements potentially could be viewed as offensive) in three circumstances: (a) when he attempts to use specific terms to represent ethnicities, (b) when he is unsure about whether or not to use the religious term "Muslim" to refer to a group of Arab students, and (c) when he discusses the rapper Eminem and his theories concerning why he is accepted into Black culture.

In addition to the use of hedges and Standard Grammar, Cola presented a significant amount of repetition and self-correction throughout the interview. He presented very careful speech heavily monitored by himself as if he were very aware of how his speech might be received. He also paused a lot during our conversation, choosing his words carefully. While these features have not been attributed just to women's speech, it also is important to note their lack of occurrence generally among male or powerful speakers. Typically when people dominate a conversation or use

language to exert power, they do not pay much attention to how their speech will be received or to the potential mistakes they may make (i.e., at least not to the point where there are an overwhelming amount of pauses present). In total, Cola paused 59 times (See Table 4) for various lengths of time perhaps either to gather his thoughts or to pronounce a word carefully in a manner that satisfied him.

Stuttering/repetition and Self-correction Responses

Repetition or stuttering as well as self-correction are present in Cola’s speech (See Table 6) in many places and are indicative of careful speech as

Table 6. *Speech Repetition Examples*

Line #	Observations
52	he’he he had a business plan
53	Mhm
54	let’s just say
55	um Papa John’s dropped outta college
56	because he w- he was in a business class?

an exhibition of female speech (Lakoff, 1975). For example, in his comments regarding the head of Papa John’s dropping out of college, Cola not only stutters and carefully corrects himself, but he also uses “um” as well as final rising intonation (Line 56) as a means of mitigating the force of his words, which points to a trepidation that could be linked to insecurity with regard to his knowledge or comfort with the topic (See Table 6).

DISCUSSION

Cola’s association of AAE with “thug people” indexes his agreement with the ideology that the use of AAE is a means of performing hyper-masculinity as it has been linked to a hyper-masculine trope not unlike figures of Black men who historically have been assigned the attribute of being overly aggressive or physically powerful. This same narrative that links AAE with masculinity that also has been taken up by both White (Bucholtz, 1999) and Asian males (Chun, 2001) is reproduced by Cola’s refusal to employ it (See Table 7), perhaps, for fear of being perceived as

Table 7. *The Futility of Aggression*

Line #	Observations
134	but we don’t have to make them fear us
135	it’s just inherent that they do
136	which is why they raided Africa with GUNS
137	instead of nets
138	because they were afraid of what we could do
139	Right
140	y’know and they’ve been afraid that the
141	entire time that
142	that we can with a certain level of guidance
143	control the the American that they see
144	y’know

overly aggressive or threatening. His position is illustrated in his comments about the potential power of Black men to exert control and simultaneously stimulate fear of what they could do in American society (Table 7, Lines 134-144). He speaks strongly from a perspective of “us versus them” (Line 135); yet, 2 times in 5 consecutive lines he uses “y’know” (Lines 140, 144), which is a hedge that is characteristic of female speech. Subsequently, in lines 148 and 152 (Table 8), a similar pattern occurs when he speaks of the inability for a Black male to ”scare your way to success,” which is followed

Table 8. *Weakness as the Path to Success*

Line #	Observations
158	y'know we can't scare
159	you can't scare your way
160	to success
161	Right
162	y'know you
163	you gotta give a little
164	you gotta you gotta show weakness
165	you gotta show vulnerability and use those
166	as your strengths

immediately by 3 lines (Table 8, lines 163-165) of the repetitive ”you gotta” phrase, which also constitutes refusal to use this “hyper-masculinity” in speech.

In turn, he positions SAE in line with education, less aggressive approaches to speech and a subtle, more gentle ideal of behavior (e.g., Line 165). Cola criticizes the lack of utility in hyper-masculinity as a stumbling block towards success (Lines 158-160), and by linking AAE with the figures he criticizes, he never refutes the performance of masculinity that AAE holds but only challenges its effects.

His rejection of this English variety, however, indirectly reproduces the negative ideology assigned to Black males (whether intentional or not). By associating AAE and what he labels as “thug” speech with negative attributes that he wishes to avoid, Cola maintains the narrative concerning Black masculinity and opts for a less threatening persona. While he reproduces some ideas concerning masculinity, he also challenges both mainstream and African-American notions of how male-ness should be performed. He maintains many features of hegemonic masculinity in speech as he consistently interrupts, dominates the conversation, and takes up only the topics of his choice.

Nevertheless, through the incorporation of “vulnerability” and “weakness” (Table 8, Lines 164-165) along with his insistence on using feminine features and the “less masculine” Standard variety, Cola complicates the notion of masculinity by employing elements associated with women’s (or powerless) speech. He both challenges and rejects the hegemonic discourse on the performance of masculinity but also reproduces the negative ideology towards Black males as hyper masculine and

potentially always in a position of posing a threat to others, specifically to Whites. Cola justifies his decisions in life, specifically his performance of masculinity, with the desire to avoid appearing as such a threat so as to not “scare away the White people,” which could prevent him from achieving the level of success he desires (Table 9, Lines 108-117).

Table 9. *“Don’t Scare White People”*

Line #	Observations
108	y'know if you scare them
109	they don't have to deal with you
110	right=
111	=they could send you away y'know
112	Right
113	cause you are a threat you are a (.)
114	y'know a nuisance
115	you don't follow rules =y'know
116	=mhm
117	and they can send you away for it

In this excerpt, Cola expresses a fear held by many people of color (or the disenfranchised at the hands of White people) that is most notably their power to “send you away” or to prevent you from attaining success should you threaten their sensibilities or notions of safety. This concern is mitigated by adhering to a set of rules that were established by the White

hegemonic structure over time, one of which being the adaptation of one's speech as to not disturb the abstract pre-determined comfort level of White people that Cola presumes exists.

CONCLUSION

Based on the findings of the analysis of recordings of an interview with Cola, a Black male who rejects the AAE variety of speech now referred to as hyper-masculinity as it is used to establish typical strength and control in a wide variety of social situations. Cola demonstrates at least some awareness of the problematic nature of his social positioning as he discusses a variety of topics of his choosing in the presence of the female researcher and interviewer. Among his topics, he discusses the historic justification for the violence of Whites towards Blacks as a defense mechanism against their assured belief that Blacks actually could take over in this country. In a time in the United States where a spotlight has been placed on violence expressed towards African-American men that could find its roots in assumptions, stereotypes and beliefs about hegemonic masculinity as well as in Black masculinity, this data analysis leads this researcher to believe that the complication of masculine personae currently is of great interest.

Furthermore, one of the implications of these findings could be the foundation not only of a survival technique for many Black men but a more feasible way of expressing their unique personae (Benor, 2010; Blommaert,

2010; Otsuji & Pennycook, 2010). This expression eventually may enable Black men to live without the restrictive confines of striving to be “man enough” as reflected in the forty years of research that documents the evolution of a “hyper-masculinity” in communication. Such striving and restrictions in communication results in numerous difficult consequences for Black males throughout our country.

At its onset, the linguistic exploration of African American English (AAE) largely was restricted to descriptions of the vernacular speech of young, urban, working class males (Fasold, 1972; Labov, 1966, 1972b; Wolfram, 1969), as an attempt to legitimize the variety in the eyes of those who denigrated it as a marker of lesser intelligence (Farrell, 1984; Jensen, 1969), by demonstrating its uniformity and systematicity (Baugh, 1999). It was also an attempt to offset the historical silencing of said men and to counteract the negative characteristics foisted upon them as unintelligent, violent, hyper-sexual brutes (Davis, 2006; Hopkinson & Moore, 2006). Despite efforts to disrupt this narrative, these stereotypes were barely disturbed and, in fact, were taken up as representative of a rigid prescription of Black masculinity and a cogent means of enacting hyper-masculinity among non-Black speakers (Bucholtz, 1999; Bucholtz & Lopez, 2011; Chun, 2001).

While these efforts, which Bucholtz (2003) referred to as “strategic essentialism,” were rooted in good intentions; yet, the limited focus erased space for variation within AAE, rendering as invisible several sub-varieties

of speech that include Middle Class AAE, African American Women’s Language and Gay male speech, and their speakers. In recent years, linguists have revisited and expanded their definitions of AAE through the exploration and inclusion of said varieties (Alim & Smitherman, 2012; Britt & Weldon, 2015; Rahman, 2008; Troutman, 2001). These fixed definitions of Black masculinity have functioned much like the original tapered preoccupation with African American Vernacular English (AAVE) by removing any potential for variation within Black male-hood and effectively excluding all who do not strictly conform to this ideological speech behavior, including men like Cola.

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APPENDIX

Methods and Transcription Conventions Used

- . end of intonation unit; falling intonation
- ,
- ? end of intonation unit; rising intonation
- :
- ~ rapid speech; speech is slurred together
- self-interruption; break in the word, choppy speech
- ° quiet phonation
- BOLD CAPS** emphasized speech
- (.) unmeasured pause, 0.5 seconds or less
- @ laughter
- h outbreath
- [overlapping speech
- (()) transcriber comment
- { } stretch of talk to which transcriber comment applies
- ((/)) broad transcription
- “ ” reported speech
- lines omitted for brevity

ART AND INFERENCE, A CRITIQUE: JUAN LOGAN'S INTRIGUING VISUAL EXPRESSIONS AS CONVERSATIONAL IMPLICATURES*

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Artist, Juan Logan uses the power of visual association as a means of engaging with human consciousness, thus, communicating with his viewers by employing indirect, conversational implicatures (i.e., "...things that a hearer can work out from the *way* something was said rather than *what* was said" [Sect. 3, para. 1]) [1]. Indeed, rather than what may *actually have been said*, or in the instance of an art work, what actually is shown (i.e., in the framework of "indirect" implicatures) may include what may or may *not* be modified by an artist, or what may *not* be shown in a given context may gain equal importance with what is shown. Clearly, intentional omission or insertion can become visual conversational elements. In Logan's work, Conversational implicatures are viewed as being transmuted into a visual rather than an aural context [2]. He first requires access to his viewer's

*Access a preliminary paper, "I'll Save You Tomorrow"...and the Art of Inference: Juan Logan's visual expressions as Conversational Implicatures," which was prepared in the process of developing a presentation planned for the 2015 conference of the *Association Internationale des Critiques d'Art*, March 2015, Paris (See endnote 1).

attention (and to the shared human capacity for understanding), which he then directs and focuses upon the objects presented in his images.

These opening comments and the content of this monograph contribution are offered based on my experiences as a critic of visual culture and as a representative member of Logan's audience. Logan seems to be offering a space in which we may unify and coalesce the sometimes personal, sometimes cultural signifiers and symbols he assembles. Such symbols are integrated within his images as meaning-filled and meaningful devices, providing access to a myriad of ideas and to a realm of thought in which the visible and tangible unite with the invisible and intelligible. Through these compelling combinations, Logan haunts one's intellectual, emotional, sensible, and sensual realities. As viewers, we may be reduced, perhaps even subordinated, by his guileful objects and his insistent demand to communicate with and through us as fellow sentient entities. He enjoins us to become bearers of his messages; indeed, this is certainly an important and evident part of his intention in sharing his works with us as his "public."

The complex associative process Logan initiates when his images are encountered is full of possibilities, intrigue, potential pitfalls and a system of intrinsic rewards that establish a challenging, multivalent, phenomenological, interactive structure, replete with political and social commentary. Our aesthetic consciousness is engaged fully as his images manipulate and cajole, bombast, and declaim as well as prompt and allude

to what we may or may not understand or adequately perceive. Concerns pertaining to the sometimes highly idiosyncratic character of this oeuvre (i.e., this particular collection of images within the totality of his artistic production) and its repudiation of a concept of universality of expressiveness (i.e., the images and their messages are often deeply personal, context specific and obscure), do not preclude the formation of a powerful, original, and profoundly individual communicative methodology. That individual communicative methodology (by virtue of its very idiosyncrasy) achieves an odd and paradoxical form of universalizing ethos (i.e., by being so intensely personal and idiosyncratic). Logan, through his works, is speaking to the human uniqueness of his viewers. Uniqueness, a quality we each possess in individualized isolation, also is a shared condition fraught with the difficulties of mutual communication, a problem that we all are likely to experience and universally may understand (i.e., ergo, a paradox).

As an audience that was first invited, perhaps lured, and finally was forced into “Juan’s world,” we encounter what is sometimes quite a difficult terrain to negotiate. Logan creates an atmosphere of sensual beauty (i.e., he clearly enjoys the “thingness” of making “things!”), a beauty replete with tensions achieved through his juxtaposition of materials and imagery that promise our efforts will result in some probable (likely to be intangible) reward. Nevertheless, viewers never are quite certain what this promised reward actually may be until they have moved through this artist’s subtle

manipulations and narrative prompts. At the conclusion of this journey, assuming survival of its exigencies, we are left only to discover that his visual conversations have pressed us personally, as his spectators, into a stark realm of personal realizations. By sharing in the distinctive patterns of his consciousness, translated to us via his use of material objects, Logan helps art spectators to question, reflect upon, and finally discover more about our own perceptions; thus, his works not only evolve into a medium not merely to engage with his awareness or consciousness but also to provide us with information about our own unique and individual selves. This realization is initially slightly shocking, then fascinating, and finally it risks being addictive (e.g., focusing on how can we find more Juan Logan works).

The journey that Logan facilitates for and with us risks being deeply disturbing. As we move through this art experience, it compels acknowledgement and acceptance of our individual human imperfections and personal challenges as a species of “thing.” Indeed, he may evoke distressing allusions to our inhumanity, our errors and our social failings; yet, personal questions also may be generated in the process. Individuals may ask questions such as: (a) Are we not better served by this facilitated access to a kind of self-actualization? (b) Are we failing to benefit from achieving a heightened awareness of what we truly are? (c) What may be our potential to become more than we are? (d) Of what are we, as humans, capable of doing? These questions are part of the implied conversation into

which we discover Logan has lured us. By the time we realize what has been happening, it is too late. We are caught. As willing victims, we seem to be thrust into a demanding self-interrogation.

If we, as an audience were to consider each visual artwork as a communicative utterance, or as if the image has been designated by him with an intention comparable to auditory description and dialectical discourse, then the effects of Logan's works seem intended in their visual "locutions" to offer an aesthetic statement on the one hand in the form of a question such as, "this is beautiful, shiny, sensual, intriguing...etc., isn't it?" (p. 101, [3]). On the other hand each has an illocutionary subtext; in the instance of Logan's beach inspired images, a subversive implication is referenced inadvertently, implying that as we gain more information concerning the subjects, we will begin to sense and "see" a consequence of race-based discrimination, economic constraint, social manipulation, and corrupt political control. This text within the visual text is not obvious at first consideration, making the secondary awareness all the more powerful as a kind of "Aha!" moment. While art spectators inferentially discover (through aesthetic engagement) the subtexts of the visual "texts," they begin to see and understand that what appears at first to be a comparatively harmless (often quite beautiful image), overflowing with pretty, oblique design references, is replete with invective, referents to social cruelty, all lurking beneath an innocuous sensuality. Consequently, the insidious demon of social injustice sneaks in upon our consciousness and catches us

unaware. This is artistic creativity as willful passive aggression; this is an engagement with a rich series of intellectual ironies. His art is Juan Logan's means for the insertion of his infectious wit and conceptual insinuation into our world.

This multivalent messages in the form of the visual representation, as an arrangement of shapes and forms, evokes an initial aesthetic response of complicity that urges our internal or spoken utterance (“...this is pretty,...isn't it?”); however, the illocutionary subtext subverts the external aesthetic “charm,” pointing the viewer relentlessly toward confrontation with a disturbing and baleful historical reality: What this represents is NOT pretty! The resultant tension between appearance and reality, between seduction and a kind of implosive, psychic destructiveness, catapults these images into a catalytic interrogatory dialectical tirade on a series of topics, including (but not limited to) what is the character of “beauty?” Logan's topics include: How can we confront and assimilate the cruelties of culture? How is appearance different from reality? What is the nature of the past's influence on our present moment? How does one's past define character and awareness? Finally, this internal interrogation continues indefinitely; Juan Logan has us in his grasp. Observers will be compelled to struggle with his images and his complicated, sometimes frightening ideas.

It is entirely reasonable to categorize Logan's recent planar visual projects as “linguistic puzzle imaging” for a number of reasons. First, his audience observes that he actually includes puzzle pieces as an ubiquitous

symbol and sign in many of his recent works. Second, the puzzle piece is an object he intends to use for its function as a linguistic sign; that is to say in these planar assemblages, it would be categorically superficial to refer to these complicated objects as “paintings.” We may infer from the assembled “pieces” the idea of “puzzle,” which = problem, which = difficulty (or the state of being difficult and requiring a solution), which = challenge, which = mystery, which = person(s). Remember at this juncture that the initial premise is that Logan’s work is about uniqueness and individuality as a consequence of his formal language, and this engagement with uniqueness (and its puzzles) is the universalizing and paradoxical supervening text, which motivates his multiple subtexts and subordinate referents. Thus, the pieces of the puzzles in the “paintings” are implied referents to “persons,” each unique and an opaque, individual mystery with an implied history of its (his or her) own. Even more intriguing, disturbing, engaging and frustrating is the problem that the longer these layered, richly textured, multi-referent objects are viewed, the more that may be seen in them, and the more additional layers of references that may be discovered. Such images seek to reveal more and more of themselves to us; thus, the greater is the suggestion that far more remains to be understood concerning the significations of imagery within each of the objects. This awareness may be either intoxicating or infuriating, depending entirely upon the individual predispositions of the given viewer. Logan, thereby, reveals not only his own idea to us (in calculated, controlled and graduated stages), but he also

serves further to reveal aspects of our own persona to us. He, in fact, offers us to ourselves as we discover our own unique responses to his complex challenges.

Another frequently employed signifier Logan explores is the disembodied head. Shown often in silhouette, the shape of the head is taken from a commercially produced plaster cast curiosity, a kind of kitsch collectible object that was sold during the Jim Crow era as an image of the familiar stereotypical “Negro mammy” figure (See *Collectors Weekly* [4]). Logan often morphs vestigial versions of this image into individual characters in various materials, including ceramic, metal, paper, canvas, and other media. The head is the seat of identity, holding the ideas of the mind, the face by which we may be recognized, the seat of our understanding and intelligence, and the site from which all internal change must be originated (i.e., as the brain works both the consciousness and the autonomic systems of the body) and is certainly a “loaded” symbol. Its evocative forms float in and out among the diverse compositions, perhaps, like a familiar melody.

Obviously, such a complex methodology creates a daunting task for the “critic” or writer designated to transform or rather translate Logan’s often entirely ineffable visual expressions into some form of reductive linguistic, sensible utterance. As spectators, each person certainly is free to feel flooded with emotion and simply respond individually to personal perceptions, but a writer, confronted with the multiple problems of interpretation and translation, is cast mercilessly into a quandary. Moreover,

using his artworks as the medium of access, Logan apparently wants much more from us, rather (i.e., a correction seems appropriate) Logan's art demands much more of us and from us. Consequently, it is through it that he evidently wishes for us to process this complexity of conceptualization into some inner realization. In my role as "critic," I suspect he wishes to excite the spectator into an internal if not an external "action" of movement toward some inner transformation, perhaps to be actualized in steps toward social change. Of course, this is one of the many powers of art (See John Dewey [5]). This generative effect at a distance possibility is akin to a kind of alchemical "magic" (i.e., the artist may transform our "awareness" and "understanding" of the world and our inner experiences via his or her work, without being personally, spatially present). The process of only "sending" a message by means of the image or event (e.g., or recording of the image or an event structured by the artist) provides an audience with options that individuals may choose to observe, but in this instance, into precisely what actions or transformations may the unwitting viewer be seduced when confronted with the spectacle of a "Sugar House" (e.g., an artistic example of a "for instance")?

JUAN LOGAN'S ART

Sugar House

What is a Sugar House? Logan assures (often by using a title that provides linguistic clues for our visual experience of his images) that his spectator will be thrust into a kind of epistemic nightmare in the form of

inner formulations. The destabilizing experience of reading cryptic, opaque titles of art images implicitly demands an answer to an inferred question “what can this mean?” A viewer of Logan’s works may be confronted with a sometimes dazzling array of textures, shapes, even detritus, in a structured relationship, which appears to have a source of coherence beyond the merely self-evident. Furthermore, how is one to “puzzle-piece” these clues together in order to understand this “visual” utterance? In short, observers may ask themselves, “WHAT does this mean?”

Sugar is sweet; most people know that in its history it was an item of luxury produced at great cost to its true harvesters (i.e., enslaved men and women). Certainly, most art viewers are aware of its role in the African diaspora but may be asking: *Could this be a house of some “ultimate” sweetness* (i.e., this “sugar house”)? A curious viewer of this work blithely may enjoy this image with its vibrant, rich, decorative colors, inclusion of elegantly composed patterns, sophisticated compositional structure, and each one may choose nonchalantly to absorb its aesthetic ambience, perhaps ignoring the lottery tickets in its patterned “planks,” only later to research the significance of the term “sugar house” [6]. This “sugar house,” a nefarious site of torture during the American Revolutionary War (described by Ballela) was used as a tool in breaking the spirits of unruly or resistant individuals who opposed the condition of being enslaved, and it has been transformed in Logan’s image into a panorama of floating, ethereal shapes with a vaguely organic appeal superimposed over a recognizable

mechanism, which is actually a treadmill. The shapes vary from what appear to be cellular structures to silhouetted contours of heads (i.e., a motif repeated in Logan's work and observed perhaps for thirty years). Spectators familiar with Logan's oeuvre will recognize the heads and be forewarned that this compositional prettification is a trap (i.e., viewers have been lured into something egregious, indeed something horrifying); of course, this is precisely Juan Logan's intention, to map for us the simultaneously seductive and destructive aspects of the capitalist system. The enslavement of human beings was (and evidently in Logan's opinion still is!) a profit-motivated system of exploitation comparable to the institutional structures implemented in the plantation system of the South (See *The Economist*, [7]).

Logan warns everyone that the methods of exploitation and destruction have morphed into new technologies and means of engagement. Instead of forcibly being attached by our hands in a state of suspension from a beam upon a treadmill, upon which we must continually pace in a Sisyphean nightmare [8] as the enslaved in Jamaica and Charleston may have been forced to do [9], we now (e.g., especially those most vulnerable in our society) may be distracting ourselves from our poverty, our ignorance, and our inadequately egalitarian political structures by games of chance (i.e., hoping to "hit a jackpot" in the lottery) [10] instead of demanding adequate affordable healthcare, well reasoned government oversight, or equity in employment opportunities. This is a horrifying yet

beautiful condemnation, but to whom is it intended to speak? Is this directed toward the powerless, the masses, those individuals who most need to become aware of this message? I think not. Logan’s work is a message of discontent aimed at the empowered. This is art as social activism.

Help Me, Save Me, Love Me

By combining the allure of the perceptible with an evocation of the intelligible, Logan’s layered messages often insinuate their content into awareness of the receiver via indirect rather than overt, direct address. This creates a sophisticated illusionism, an engagement with the generation of “phantastic” (i.e., as in the sense of phantasms ...ghostly visions) imagination and provocative image-inducement, rather than icastic, imitative reproductions or mere facsimiles of what we experience in reality [11]. Consequently, his communicative style is recognized frequently as oblique, ironic and Socratic, demanding a response from his viewers by composing the representations in the artwork in the form of a visual question (e.g., “What is” or “Why is this?”), which is facilitated by allusion, association, and inference. This approach generates a fascinating tension through the contrast of the method utilized in the creation of the image when it is juxtaposed against the demanding direct address of the title in the work called, “Help Me, Save Me, Love Me” (2009, mixed media, 5’ x 16’), an image which alludes to the political incompetence that led to a largely avoidable loss of life during the Hurricane Katrina crisis of 2005. The crisis resulted not merely from human helplessness in the face of the power (if not

the wrath) of Nature, but in large part, misery deriving from inadequate planning and insufficient preparation (particularly with regard to empathic considerations of the poor, or persons whose care challenges resources), bureaucratic incompetence, administrative insensitivity, and ingrained racial polemics (See Elizabeth Chuck [12]). A large red cross anchors the composition, and circumnavigating this nexus, are the puzzle pieces, representing the human presence in the terrible tragedy fomented in the aftermath of Hurricane Katrina. The large red cross in the composition, both symbolizing the presence of and alluding to the circumstantial failures of the important charitable organization of the same name, and it offers his audience a bird's-eye view of an interpretation of the logistical nightmare that resulted in danger, rioting, and death (when poor victims were instructed to seek refuge from the storm at the New Orleans Superdome); subsequently, the Superdome environment devolved into a site of criminal infamy due to lack of resources and preparedness by the local and national bureaucracies [12]. This specific Logan work provides an inquiry into the alienation and isolation of American society even as we, as human beings, exist in the midst of a social community network. Here allusion combines with illusion to reference collusion and indeed corruption and confusion in intention, politics, and multivalent aspects of social engagements of varying descriptions. This is certainly a confounding complexity of significations, which reveals its multiple messages only via a self-revelatory unstructuring; therefore, a deconstructive model is used that is based in a

demanding investigative process of viewer contemplation and applied consciousness. Engaging us in a righteously indignant awareness of the seamy necessity of politics is the point in this work, and through it Logan is issuing an edict to require that his spectators consider the human condition and our own indifference as well as our lapses in humanity and the morally-mandated requirement for consideration of humane extensions of services to our peers in need.

Truth Be Told

In confronting the image entitled “Truth Be Told” (2011, mixed media on canvas, 84” x 96”), spectators may attempt to deconstruct the significations of the numerous components of the work. A collection of the familiar puzzle pieces, which are shown in light “paper-bag” brown, tan, beige and white are shown with clear separations of the canvas into rather regimented compartments, with ethereal, white, floating, cloudlike forms, which are themselves superimposed upon fragments of what appear to be commercial magazine covers (one of which prominently features the word “guns”).

These components combined with the disembodied “mammy” head, which is quite familiar in other Logan works, might stimulate viewers to wonder, what can these things have in common? The deep, black shapes on the canvas, under a repeated motif of the white, floating, cloud-like forms are placed upon a lyrical, floral wall-paper pattern (denoting middle-class status) with small pools of rich, deep, cerulean blues that randomly are

distributed across this garden-like, pastoral “ground” of a floral, wall-papered network. If we were to attempt to make sense of this matrix of associated forms and colors with the task of interpreting their shared rationale, it quickly might be discovered that we have been trapped within what probably would have to be referred to as a “fool’s errand.” It seems that observers are left to seek to discover more, but “we know not what.” Viewers may feel a sense of abandonment before this daunting spectacle of vibrant colors to wonder “What on earth, can this evidently random assembly of such completely different things possibly ‘mean’?” Upon reflection, perhaps our “fool’s errand” isn’t quite as “foolish” as we initially suspected. The underlying message in this work is the very process of deferral and differentiation with all of its ramifications, but particularly (in this instance) the focus is on allusions to class and race, and the curious phenomenon of intra-segregation [13].

Are the clouds in this Logan work actually “clouds” or cotton balls, or are they cotton fields? The clouds can be references to those persons who were enslaved, constrained to suffer through a daily ordeal of arduous manual labor and the possible contrast in quality of life with those somewhat more fortunate African-descended individuals who may have been highly valued skilled laborers (e.g., coopers, carpenters, seamstresses, furniture makers, ceramists, carters, cooks, and masons). Those who were enslaved in a more permissive atmosphere, perhaps in some instances due to their familial relationship with their enslavers [14], and as a consequence

of their resultant light complexions, in some cases, they were given work within the home of the enslaver (or conversely, sometimes suffering even harsher penalties for their horrifying condition due to their proximities to the status quo “whiteness” and embodiment of rapine infidelities and sadistic indulgence). Many authors discuss this topic (e.g., Harriet Jacobs, [15]).

This is an image with an irritating and ugly message, which simultaneously alludes to race pride, achievement, and the well-established and privileged middle and upper class of African Americans whose category is as old as the American nation and the legal enslavement upon which America’s race-based social and cultural hierarchy was long established (See Hochschild & Weaver [13]). This is a particularly bitter pill to swallow in terms of the social difficulties of differentiation to which it obliquely and quite poignantly alludes.

Wasting Away

In “Wasting Away” (2010, mixed media, 72”x 96”), Logan addresses the erosion of the spirit as the disenfranchised are left to wait upon the more empowered to take the necessary actions that will bring relief, renewal, and revivification. This image is a sign or symbol for the concept of salvation; the transforming moment that either arrives too slowly to have the desired impact, or simply never comes at all, leaving the hopeful in a desperate state of “wasting away.” While this work employs the Katrina crisis as a point of departure for its theme. In fact, it references all unrealized dreams deferred,

all postponements of potential, all incidences of hapless, hopeless existence, condensed into a myriad of multicolored puzzle pieces that symbolize the role of the individual as a part of a larger “picture,” cultural structure, society, and culture, which in this instance seems to be never adequately coalescing, never realizing what they truly are in a coherent image, never gaining realization of their frustrated potential. This work may be interpreted as a possible, even a probable condemnation of any society that could employ the virtue-ethical model of Aristotelian eudaimonic actualization [16], but the society is too disinterested, too dispersed, too self-possessed with preoccupations of class and bureaucratic structure to be bothered with actually caring for and saving individuals (e.g., *After Katrina* [12]).

Reminders of the casualties of indifference appear to haunt the observer through this image with its delineations of map-like forms and a bird’s eye, god-like suggestion of an extended populated vista. The form of the image is at least in part inspired by the aerial photographic and film images of the Katrina victims who were transformed into a spectacle in the media and who suffered and starved as news companies flew above them. Clearly, in this crisis of the city of New Orleans, the media definitely had access to the victims Katrina, but these entities with access provided no aid, no food, no fresh water (as news agencies are in the business of recording the news, not transforming it [17]). While performing the highly valuable service of making the nation aware of the nature of the dilemma in the days

following a terrible natural disaster exacerbated by human foible and error, despite the evident urgency of need, there were individuals with access who were employed under a professionally authorized mandate not to interfere or intervene but rather to interview, document and report [17]. Their only authorized role was to report on the difficulties of human decimation as they circled above and watched, and in turn caused the wider public to watch, as human life simply “wasted away.” This image precipitates a horrifying, and deeply ironic realization.

Lincoln Beach

The demographic transitions due to political machinations are a subtextual rationale for *Lincoln Beach* (2008, mixed media, 48” x 60”), which refers to a now defunct product of the age of segregation (i.e., created for African Americans in the city of New Orleans) referenced in a work by historian Andrew Kahr, entitled, *The Land Was Ours: African American Beaches from Jim Crow to the Sunbelt South* [18]. Logan’s image reproduces an aerial view of the lake and its levees, showing the contours of its approximate shape in a beautifully abstract, organic, geometric figure of rich multivalued blues, placed upon a background of tropical, palm-covered wall papers, showing evidently an alluring and exotic location. The occasional inclusion of a floating disembodied head in the composition, sometimes brown, sometimes a greyish white, or a shape from which we may infer a portion of a disembodied head, shown as a black edge, which is located in the area that corresponds to where the formerly segregated beach

was physically situated on the actual site of Lake Pontchartrain as the image corresponds to cartographic truth.

Originally established on an abbreviated section of the shore of Lake Pontchartrain, in proximity to an area known to local residents as "Little Woods," Lincoln Beach was a concession (under Southern Jim Crow legislation) to some form of provision for the African-American populace of New Orleans (in the period of the 1930s), a then under-developed Eastern region of the Ninth Ward, to obtain a space dedicated to the recreation of the city's citizens of color [18]. Kahrl indicates that the site was purchased from its owner, Samuel Zemurray in 1939 following his transfer of deed to the city of New Orleans in 1938 under the aegis of the Orleans Levee Board, which designated this contained section of the shore as a swimming area in the lake for "colored" New Orleans residents, adding a landfill section that extended into the lake upon which the amusement park was built. Modeled on the example of the segregated "whites only" Pontchartrain Beach amusement park, Lincoln Beach Amusement Park was constructed with less grandeur, assuring that the African-descended populace would find its amusements on a smaller, more appropriately humble (by comparison) scale, which was a political nuance attributable to Jim Crow racism. The park did feature some diversity in its amusement offerings including rides, games, restaurants, a swimming pool as well as the possibility of lake swimming. Perhaps its most attractive asset was the inclusion of live music performances and concerts on a regular basis,

including such artists as the well known and widely recognized, Fats Domino. Following the desegregation of Pontchartrain Beach, by law due to the Public Accommodations Act of 1964 [19], the African-American owned amusements and businesses declined rapidly at Lincoln Beach, where the coerced constraints of its curtailed amusements lost their appeal to the formerly conscripted patrons [20]. Andrew Kahrl notes that as a result, it soon was rendered completely defunct, and its decaying remnants, a reminder of its former vitality, have remained inactive [18].

Some Clouds Are Darker

In the image “Some Clouds Are Darker” (2011, mixed media, 72” x 96”), observers see eight, fluffy, pale forms which may be “read” as “clouds” and may be spatially interpreted (based on a conventional perceptual assessment grounded in the traditions of Western art) as hovering above a large, ominous, dark mass, which is bordered below by a verdant crescent, filled with the now familiar puzzle signifiers (some of which also appear in the hovering pale cloud-like forms). Large dark droplet forms seem to descend from the upper region of the composition, and these invasive, liquid-alluding shapes (at least two of which at the opposing sides of the base of the composition are actually silhouettes of the repeatedly used, signifying “Negro mammy” heads) may serve to remind us of the notorious “one drop” rule, pertaining to African ancestry as a legally defining component of status in America’s history permitting (or more correctly prohibiting) adequate access to the rights and privileges of

citizenship [21]. In essence, “[t]he centuries-old ‘one-drop’ rule’ assigning minority status to mixed-race individuals appears to live on in our modern-day perception and categorization of individuals like Barack Obama, Tiger Woods, and Halle Berry” ([21] para. 1). In this Logan image, the shapes and their colors (or lack of color) seem to allude to the ingrained social and cultural cues that a black cloud is ominous, foreboding, and fear-inducing, while the lighter clouds may be perceived as innocuous and playful, even cheerful. This system of evocative perceptual response is all part of a complex matrix of linguistic and cultural encoding in this work to which each of us may be subject and of which Logan wishes us to become increasingly more aware.

The black, silhouetted heads serve as symbols of presence, the multicolored puzzle pieces in the green crescent could suggest diversity (e.g., conceptual diversity and actual demographic diversity of ethnicities and human groupings). The white-ish clouds and the rich, black form may be allusions to separation and socially administered segregation by “race” even in the presence of the removal of the archane and absurd laws that mandated from 1896 (i.e., *Plessy vs. Ferguson* [22]) until 1964 (i.e., until the passage of the Public Accommodations Act [19]) that persons live and work according to the perceivable quantity of an amino acid (tyrosine) derivative, that is to say, the skin pigment (i.e., melanin) produced in the basal area of the epidermis (i.e., one of the most important determinants of a perception of one’s socially assigned “race”) [23]. Although it may seem

incredibly stupid, in retrospect, to discover that this feature of human biochemistry was a major organizing structure with powerful and affecting legal considerations (and which continues to harbor extraordinary influence in social mobility) also was an organizing principle around which government and civic structures were (and still are) created. Logan challenges this idiocy obliquely in his evocative work, “Some Clouds Are Darker.”

I’ll Save You Tomorrow...

The last image undertaken in this discussion, considered only briefly, is “I’ll Save You Tomorrow” (2014, mixed media on canvas, 60” x 140”), a vivid image, once again with sharp delineations between compartments of the canvas’ surface and a repeat of many familiar symbols; the disembodied head, now black puzzle pieces (at the top of the composition on the viewer’s left), the sign of a cross (not a red cross here, although this may yet be a reference to the horrors engendered by incompetence after Hurricane Katrina). Such images may now allude equally to the concept of religious salvation, the role of the church within American society, and the middle-class delay, deferral, and seeming indifference to evidence of poverty, privation, and denial often occurring in neighborhoods surrounding churches that wish to be thought of as (and are often reputed to be) within their own self-referential mythologies (i.e., havens of spiritual, moral, and intellectual uplift but with their own discreet politics), and the imperfections of specific congregations may be simply insular gatherings of self-serving

social derelicts. Among the bow-ties and disembodied heads on the richly textured blue and multicolored composite figure on the right of the composition, contrasted with a vibrant, deep scarlet ground, what viewers see looks like life-saver buoys (i.e., forms that remind us of the floating circular objects cast onto the water to prevent the drowning in distress from being pulled under water). Are these indications of outreach, of hope for those who may be saved? Are these unused resources demonstrations of the capacity to save, without the will to move to action? True to his tendency, Logan has left us to decide for ourselves, to write our own narrative, to reveal our own understanding of his comment upon the American and the global condition of and role for “humane” action. Rather, is this a warning against indifference, isolation, and detached solipsism? Perhaps we will be “saved,” or we will “save” others tomorrow. Maybe we will be distracted by washing our car or filing our finger nails; only we can be aware (individually) of what future action or actions we may take. This is perhaps the most existential of the discussed works within Logan’s often decidedly Marxist critique of and commentary upon our culture, our history, and our society [24].

CONCLUSION

In concluding this written description of my own dialectical experience and inner conversation with and about the works of Juan Logan and their extensive associative powers, their implicatures, and their poly-referential impetus, I have been made aware of the fact that there is always

more to understand, reveal, research, and study about this body of work and about the history (i.e., based upon real events) in which it is grounded. Indeed, there is so much more to consider and discuss regarding these complex, multivalent assemblage images that I find myself at a precipice; thus, for the present moment, I am forced to concede a need for deferral. This is a need to put aside this sometimes grueling, self-interrogating undertaking and its intrinsically demanding exigencies.

Juan Logan's art is laborious, in the proception, perception and reception of its messages, both for its generator (i.e., the creative genesis of its perspectives) and for its audience as recipients of its content. It is, by the artist's own certification, quite intentionally difficult [25].

I openly confess that his extraordinary combination of visual and conceptual overload has precipitated, for me, a personal crisis. Indeed, I must withdraw from the perceptual field and the richly textured, multilevel, contemplative ambient created by Logan's works. I find that, having offered my own consciousness to these images for a sustained amount of time, the diverse, significant complexities of Logan's resilient visual resourcefulness, which is so extended socially, culturally and intellectually, has rendered my brain, happily, quite "full." His is an approach to visual culture that does not merely reward the perceptual responsiveness of the physical ocular sense, but this also is a purposive delving into the realm of engagement with the forces of intelligible as well as perceptible forms. Logan's audience will discover an artistic oeuvre intended not merely to

delight the eye, but the discovery comparably is predetermined to enhance the quality of the life of the mind and spirit. I leave each spectator to come to terms (in his or her own time and each in his or her own manner; See Logan's website [26]) with a powerful communicative, artistic force and an equally determined and relentless social consciousness.

ENDNOTES

1. See the Wayne Davis, article "Implicature", *The Stanford Encyclopedia of Philosophy* (Spring 2013 Edition), edited by Edward N. Zalta, accessed on November 5, 2016 at URL= <<http://plato.stanford.edu/archives/spr2013/entries/implicature/>. As quoted below, Davis states that "'Implicature' denotes either (i) the act of meaning, implying, or suggesting one thing by saying something else, or (ii) the object of that act" [Introduction, para. 1]. In the sense used in this essay, [implicatures] are a suggestion that (rather than being part of an actual...[image]) the use of particular configurations that allude to the idea of meaning...[in a work of art], "which may be dependent upon a presupposed conversational context, whether conventionally understood" (in different senses) or unconventionally understood" (See Davis section on Forms of Conversational Implicature, section 3, from which this statement has been interpolated; [i.e., as referred to in comments regarding semantics] by use of metonymy, allegory, or symbol). Davis further writes in the introductory paragraph to this article on implicatures: "Implicature has been invoked for a variety of purposes, from defending controversial semantic claims in philosophy to explaining lexical gaps in linguistics. H. P. Grice, who coined the term 'implicature,' and classified the phenomenon, developed an influential theory to explain and predict conversational implicatures, and describe how they arise and are understood" [para. 1].

In writing about Grice, Grandy and Warner have offered a simple definition of conversational implicatures used here that emphasizes "...the way something was said rather than the words that were said" [Sect. 3, para. 1]. See Grandy, R. E., & Warner, R. (2014, Spring Edition). Paul Grice. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Online). Accessed October, 28, 2016 from URL <<http://plato.stanford.edu/archives/spr2014/entries/grice/>>.

As noted in the footnote on the first page of this work, portions of this paper are substantially similar to earlier writing by the author online. Frank Martin, (2014). "I'll Save You Tomorrow"...and the Art of Inference: Juan Logan's visual expressions as Conversational Implicatures" was prepared in the process of developing a presentation planned for the 2015 conference of the *Association Internationale des Critiques d'Art*, March 2015, Paris, France. Accessed online October 28, 2016 from https://www.academia.edu/7106648/JUANLOGANThe_Art_of_Inference_III

2. Here the use of "Conversational Implicatures" as applied to works of art is a reference to the artist's inclination to use metaphor, irony, and understatement as important components within an implied visual and conversational discourse with his audience, which must infer meaning indirectly from what is or is not shown or included in an image, in addition to the manner in which what is shown may be represented. A literature search yielded evidence that scholars of conceptual art appear to be writing about the concept of conversational implicature as it may be applied within the visual realm. For example. Robert Hopkins' essay "Speaking Through Silence: Conceptual Art and Conversational Implicature," in Peter Goldie and Elizabeth Schellekens (Eds.), *Philosophy and Conceptual Art*, Oxford, UK: Oxford University Press, 2007 (Also a critique of Hopkins' essay is offered by Robert Yanal in the electronic journal, *Notre Dame Philosophical Reviews* at: <http://ndpr.nd.edu/news/23535-philosophy-and-conceptual-art/>, which was accessed November 13, 2016.

3. For greater insight pertaining to the extension of the locutionary act, see John L. Austin (1962), *How to Do Things with Words*, Oxford, UK: Oxford University Press, p. 101: "Saying something will often, or even normally, produce certain consequential effects upon the feelings, thoughts, or actions of the audience, or of the speaker, or of other persons: and it may be done with the design, intention, or purpose of producing them." My intention here is to equate verbal locutions with visual representations as "communicative" acts forcing the viewers, comparable to listeners, into an awareness of terminology use, reference and signification. Indeed, we often translate images into words and vice versa, and this serves as a rationale for the claim of a logical relationship between speech acts and the interpretation of visual phenomena.

4. African-American memorabilia from the late 19th and into the early 20th century has become a significant source for collectors; see the *Collectors' Weekly* online article entitled "Black Memorabilia," which was accessed October 20, 2016 from <http://www.collectorsweekly.com/advertising/black-memorabilia>.

5. See discussion of art as a transformative experience, in the writings of the philosopher, John Dewey, particularly his 1934 work entitled, *Art As Experience*, pp. 1-107, The Berkley Publishing Group, New York.

6. The “Sugar House” also is referenced as a make-shift prison during the American Revolution, utilized by the British as well as a site of torture. See Jonathan Gillett’s letter (1911) “The Prisons Of New York,” in the Danske Dandridge (2010) book, *American Prisoners of the Revolution*, : Hardcore Press. Access Genealogy (Retrieved February 11, 2011). (Available online from <http://www.americanwars.org/american-prisoners-revolution/prisons-new-york-jonathan-gillett.htm>.) Also see David Ballela’s (September 17, 2009) “The Sugar House As A Prison During The Revolutionary War” published by Knickerbocker Village New York, which was retrieved on February 12, 2011 from <http://knickerbockervillage.blogspot.com/2009/09/sugar-house-in-1800s.html>. Also see as well William H. Hanford’s (January 15, 1852). “Incidents of the Revolution: Recollections of the Old Sugar House Prison,” *The New York Times*. Retrieved February 11, 2011 (Online). For more information pertaining to this signification, see http://www.digplanet.com/wiki/Sugar_house_prisons_in_New_York_City.

7. In 2013, Robert W. Fogel and Stanley L. Engerman were credited as authors of “the most famous contribution to the debate” (para. 3) on the economic profitability of slavery (“Did slavery make economic sense?” *The Economist*, Online, September 27, 2013. Accessed Nov 7, 2016 from <http://www.economist.com/blogs/freeexchange/2013/09/economic-history-2>). In *Time on the Cross* (1989), Fogel and Engerman suggested that slavery in the American South was successful for plantation owners and that slavery, in general, was highly profitable, yielding rates of return that were comparable to those available in the most outstanding manufacturing opportunities of that time.

8. Many readers will be aware of the horrible punishment of Sisyphus, the ... “sinner condemned in Tartarus to an eternity of rolling a boulder uphill then watching it roll back down again. Sisyphus was founder and king of Corinth, or Ephyra as it was called in those days. He was notorious as the most cunning knave on earth. His greatest triumph came at the end of his life, when the god Hades came to claim him personally for the kingdom of the dead. Hades had brought along a pair of handcuffs, a comparative novelty, and Sisyphus expressed such an interest that Hades was persuaded to demonstrate their use – on himself” (para. 1). “And so it came about that the high lord of the Underworld was kept locked up in a closet at Sisyphus’s house for many a day, a circumstance which put the great chain of being seriously out of whack” (para. 2) No one, during this period could die, creating a considerable dilemma. See the online *Encyclopedia of Greek Myth*, a resource for teachers, at

<http://www.mythweb.com/encyc/entries/sisyphus.html>. The point being made is that the most vulnerable in society are lured into a cycle in which they are programmed and encouraged to repeat their errors of judgment in an endless cycle of oppression and “pipe dreams” of an evasive and unlikely escape from a state of ongoing desperation. Logan’s work may be understood as reflecting the contemporary desperation of the economically oppressed who may express their condition by behaviors such as gambling addictions.

9. Logan is expressly interested in the relevance of this term, the “Sugar House” as a reference to the sites utilized to torture enslaved Africans. Imara Jones notes: Slave revolts and acts of sabotage were relatively common on Southern plantations. As economic enterprises, the disruption in production was bad for business. Over time a system of oppression emerged to keep things humming along. This centered on singling out slaves for public torture who had either participated in acts of defiance or who tended towards noncompliance. In fact, the most recalcitrant slaves were sent to institutions, such as the “Sugar House” in Charleston, S.C., where cruelty was used to elicit cooperation. Slavery’s most inhumane aspects were just another tool to guarantee the bottom line. In an article referencing the popular cultural film which poses a myth pertaining to the historical assessment, Django provided online at < http://colorlines.com/archives/2013/01/10_things_djang_wont_tell_you_about_slavery.html (Accessed January 24, 2014). The Charleston Sugar House is specifically referenced in a freedom narrative given online at <http://docsouth.unc.edu/neh/runaway/summary.html>. On this site provided by the University of North Carolina, Zachary Hutchins provides information on the functions of the Sugar House under Recollections of Slavery by a Runaway Slave, *The Emancipator*, the newspaper of the American Anti-Slavery Society, August 23rd, September 13th, September 20th, October 11th, October 18th, 1838. The author’s name is not provided, but transcription of the described incidents and conditions is thought to have been written by the editor of the paper, the Reverend Joshua Leavitt. The horrors of this narrative have to read to be fully appreciated, only minor excerpts are reproduced below: "After two years with Cohan, the narrator ran away following a severe beating intended to extort information about hog meat that another slave had stolen. He avoided capture for a month before he was captured and sent to the Sugar House in Charleston, an institution for slave correction. In the Sugar House, the narrator almost died, leading Cohan to sell him in June 1837 for \$700 to John Fogle. Cohen originally bought him for \$1,200, and he attributes the decline in value to the strains put upon the narrator's health by his time in the Sugar Housw..." For those slave owners who are either incapable of punishing their own slaves or who prefer to have others do so, the Sugar House in Charleston provides a variety of disciplinary services. The narrator states that he has "heard a great deal said about hell, and wicked places, but I don't think there is any worse hell

than that sugar house," where the tops of the walls are covered with "broken glass bottles . . . to keep us from climbing over." Inside the Sugar House, slaves were kept in dungeon-like cells and brought daily to the whipping room where "every way you look you can see paddles, and whips, and cow skins, and bluejays, and cat-o'-nine tails." The proprietors of the Sugar House "treat whipping as an art form, something to be approached with a variety of tools and techniques, depending on whether the slave owner desired to maximize pain, to minimize scarring, or to achieve some other disciplinary objective."

10. Jordan Ballor (2016, January 19), in an online article, "The Moral and Economic Poverty of the Lottery," *Acton Commentary* (The Acton Institute and the *Journal of Markets and Morality*. Accessed November 7, 2016 from <http://www.acton.org/pub/commentary/2016/01/19/moral-economic-poverty-lottery>), writes "Those who play the lottery are predominantly poor, by a wide and shocking margin. The few dollars a year that a middle- or upper-class family might spend on lottery tickets for special Powerball drawings or stocking stuffers at Christmas is a sharp departure from the gaming experience of many poorer players. As one study has found, those in the lowest socioeconomic quintile are about one and a half times as likely (61 percent) than other groups (42-43 percent) to have played the lottery within the past year. And not only do the poor play more often, they spend much more as well. For households that make less than \$10,000 per year, around 6 percent is typically spent on lotteries" (para. 5). "The political philosopher Edmund Burke (1729-1797) detected great danger in government promotion of gambling. From isolated games of chance and even lottery syndicates, Burke advised, could come a broader culture of speculation and fortune-seeking that would impoverish a nation" (para. 8).

11. The phantastic or "fantastic"/ "icastic" distinction in images is discussed by Plato in his Sophist dialogue (translated by F. M. Cornford); see *The Collected Dialogues of Plato, Including the Letters*, edited by Edith Hamilton and Huntington Cairns, with Introduction and Prefatory Notes, Bollingen Series, LXXI, (Princeton NJ: Princeton University Press), 2005, pp. 957-1017. The distinction is introduced on page 978 at 235b with specific mention of icastic truthfully imitative images at 235d and phantasma (semblances or manipulated allusions) at 236b. Further discussion of this important traditional distinction between categories of representation is offered by Paul Michael Allen, in *ICASTES: Marsilio Ficino's Interpretation of Plato's Sophist* (1989, Five Studies and a Critical Edition with Translation), Berkeley, CA: University of California Press, Berkeley, which provides a thorough discussion of the association of icastic contrasted with phantastic images and their associations with the classical and Renaissance understanding of demonology and effects designated to the human spirit, citing the role of philosopher Marsilio Ficino during the period of the transition from

the early phases of the Renaissance to the high Renaissance in advancing these concepts. The ideas formulated during this time, established the precedent for Western art's early penchant for precise, naturalistic imitation, a tendency that was later at least partially rejected by the Mannerists. Subsequently, this penchant then strengthened and was upheld through successive artistic periods until the third quarter of the 19th century when the fantastic in art again emerged (beginning in the late 19th century). Until then the fully realized "fantastic" predisposition, moving toward increased abstraction and psychological associative approaches, supervened beginning in the early 20th century continuing into the 21st century.

12. See Elizabeth Chuck, "Where is Disgraced Former FEMA Chief Michael Brown Now?" NBC News, August 27th, 10th Anniversary of Hurricane Katrina, posted August 27th 2015. Accessed October 20, 2016 from <http://www.nbcnews.com/storyline/hurricane-katrina-anniversary/heck-job-brownie-where-disgraced-fema-head-now-n400436>. Also see Peter Dreier's "Katrina: A Political Disaster" In "After Katrina," *Shelterforce Online, Issue #145*, (Spring, 2006), National Housing Institute, Montclair, NJ. Accessed November 7, 2016 from <http://nhi.org/online/issues/145/politicaldisaster.html> "Conservative pundits and politicians have characterized Bush's mishandling of the disaster as the inherent inefficiency of 'big government.' But government – whether big or small – can be competent. In fact, the federal government has a reasonably good track record of responding to earthquakes, floods and hurricanes. President Lyndon Johnson quickly and competently responded to Hurricane Betsy, which struck New Orleans in September 1965" (Incompetence or Indifference [sect. 3], para. 1). "Conservatives like President George W. Bush...argue... we need to further reduce government, in large part, by cutting taxes even more, especially for the very rich. They call this "starving the beast"– reducing taxes so much that government in general, and the federal government in particular, will be virtually paralyzed" (Sect. 3, para. 3). "With the Katrina disaster, these conservatives got what they were looking for. When it was needed most, government was paralyzed. Americans watched in shock as the consequences played themselves out on television" (Sect. 3, para. 3).

13. Pertaining to the phenomenon of Intra-racial segregation, or separation within a racially identified group with reference to an internal color hierarchy. See Jennifer L. Hochschild and V. Weaver (2007), *The Skin Color Paradox and the American Racial Order, Social Forces, 86(2)*, 643-670. In their abstract, Hochschild and Weaver note: "Darkskinned Blacks in the United States have lower socioeconomic status, more punitive relationships with the criminal justice system, diminished prestige, and less likelihood of holding elective office compared with their lighter counterparts. This phenomenon of 'colorism' both occurs within the African American community and is expressed by outsiders, and most blacks are aware of it. Nevertheless, blacks'

perceptions of discrimination, and belief that their fates are linked or are an attachment to their race almost never vary by skin color. We identify this disparity between treatment and political attitudes as ‘the skin color paradox,’ and use it as a window into the politics of race in the United States over the past half-century” (Abstract, para. 1). “Using national surveys, the authors explain the skin color paradox as follows: Blacks’ commitment to racial identity overrides the potential for skin color discrimination to have political significance. That is, because most Blacks see the fight against racial hierarchy as requiring their primary allegiance, they do not see or do not choose to express concern about the internal hierarchy of skin tone. Thus, dark-skinned Blacks’ widespread experience of harm has no political outlet—which generates the skin color paradox” (Abstract, para. 2). “The article concludes by asking how much concern the skin-color paradox really warrants. Without fully resolving that question, it is noted that “policies designed to solve the problem of racial hierarchy are not helpful to and may even make worse the problem of skin color hierarchy within the Black population” (Abstract, para. 3). The psychological difficulties and damages of this inadequately discussed phenomenon within communities of color is an exceptionally challenging conversation to sustain due to the fact that it shows those who are discriminated against due to color are using the same criteria to demean and discriminate against others within their own disenfranchised ethnic or “racial“ group. Such behavior reinforces their own diminished status by reifying an authoritative validity for socio-cultural applications of color-based social hierarchies.

14. See Excerpts of the *Narrative of the Life of Frederick Douglass* (1845) Online in which the life of slaves is discussed regarding social distinctions between slaves of the plantation households and slaves doing field work. Available on line (Accessed November 7, 2016) from http://americanabolitionist.liberalarts.iupui.edu/plantation_life.htm

15. Harriet Jacobs, *Incidents in the Life of a Slave Girl* (Originally published in 1861). (2007). FQ Classics. Also see Jean Fagan Yellin’s *Harriet Jacobs: A Life*. New York: Basic Books. For immediate information regarding basic facts of Jacobs’ life, see “Harriet A. Jacobs (Harriet Ann), 1813-1897.” Documenting the American South (Online) University of North Carolina, University Library, Chapel Hill, NC. Accessed November 18, 2016 from <http://docsouth.unc.edu/fpn/jacobs/bio.html>

16. Eudaimonia is commonly translated as “happiness;” however, “human flourishing” has been proposed as a more appropriate translation. Etymologically, it is derived from a combination of the words “eu” (“good”) and “daimōn” (“spirit”) according to *Online Etymology Dictionary*: <http://www.etymonline.com/index.php?term=eudaemonic> accessed October 20, 2016. A crucial component in Aristotelian ethical and political philosophy, along with the terms “aretē,” translated as

“virtue” or “excellence,” and “phronesis,” often translated as “practical or ethical wisdom” according to Ross and Urmson. Aristotle’s moral theory is predicated upon a teleological, or purposive theory of human existence. Human beings are assumed to have an inherent purpose stemming from our capacity to reason, which separates us from other species on our small planet. Thus, in order to actualize our purpose as reasoners and seek our eudaimonic, happiness-based, or “flourishing in functioning” telos (specific individual, or species designated “universal” purpose) we must learn to reason well, and indeed it is seen by Aristotle as the role of society to support each of us in this endeavor of learning to reason well as fundamentally reasoning beings. See his arguments in support of this moral theory in “Nicomachean Ethics,” translated by W. D. Ross and revised by J. O. Urmson in *The Complete Works of Aristotle* (The Revised Oxford Translation, edited by Jonathan Barnes, Bollingen Series LXXI 2. Princeton, NJ: University Press), 1984, pp. 1729-1867.

17. Joseph Scanlon’s documentation of the mandate to the press during Katrina to interview but not necessarily aid victims was obtained online. See J. Scanlon (Undated). “Research About Mass Media and Disaster: Never (Well Hardly Ever) The Twain Shall Meet,” Federal Emergency Management Agency (FEMA), Bothell, MD. Accessed November 7, 2016 from <https://training.fema.gov/emiweb/downloads/scanlonjournalism.pdf> that discusses media protocols for covering disasters, grief, and human suffering.

18. See Andrew W. Kahl, (2012). *The Land Was Ours: African American Beaches from Jim Crow to the Sunbelt South* (Cambridge, MA: Harvard University Press), and Kahl’s (2012) informative historical essay in the catalogue, “Juan Logan: Pleasure and Power,” Barton College Museum Press, Wilson, NC.

19. The Civil Rights Act of 1964 (Pub.L. 88–352, 78 Stat. 241, enacted July 2, 1964) known also as the Public Accommodations Act of 1964 is a landmark piece of civil rights legislation in the United States, which rendered illegal formerly accepted discrimination against racial, ethnic, national and religious minorities, and women. Source of the following commentary is from the online publication accessed November 7, 2016 from the United States Government Publishing Office website <https://www.gpo.gov/fdsys/pkg/STATUTE-78/pdf/STATUTE-78-Pg241.pdf>. This legislation ended unequal application of voter registration requirements and racial segregation in schools, at the workplace and also by facilities that served the general public (all falling within the rubric of “public accommodations”). Initially, enforcement of the act lacked sufficient federal backing; however, when Congress asserted its authority to legislate under several different parts of the United States Constitution (principally its power to regulate interstate commerce under Article One, section 8), its duty to guarantee all citizens equal protection of the laws under the Fourteenth Amendment and its duty to protect voting rights under the Fifteenth

Amendment, the act was given greater support. The Civil Rights Act (including the Public Accommodations Act) was signed into law by President Lyndon B. Johnson on July 2, 1964 at the White House as documented by the Library of Congress, Washington, DC and available on line from <https://www.loc.gov/exhibits/civil-rights-act/civil-rights-act-of-1964.html>.

20. Lincoln Beach opened in 1954 as a segregated amusement park and swimming area for New Orleans' black citizens that only lasted a decade, as it was closed after the passage of the Civil Rights Act of 1964. See Jeff Adelson's newspaper article "Lincoln Beach redevelopment and restoration being discussed by city officials," *The New Orleans Advocate* (August 6, 2016), in which the decline of its popularity is discussed. Available online and accessed November 7, 2016 from http://www.theadvocate.com/new_orleans/news/article_c4454f08-5c19-11e6-a912-6323a9bd7f8e.html

21. The one drop rule is discussed by Steve Bradt, staff writer for the Harvard Gazette, in an article provided online, which is available at <http://news.harvard.edu/gazette/story/2010/12/'one-drop-rule'-persists/>. Bradt notes that: "In the United States, the 'one-drop rule'—also known as hypodescent—dates to a 1662 Virginia law on the treatment of mixed-race individuals. The legal notion of hypodescent has been upheld as recently as 1985, when a Louisiana court ruled that a woman with a black great-great-great-great-grandmother could not identify herself as "white" on her passport" (para. 4). "One of the remarkable things about our research on hypodescent is what it tells us about the hierarchical nature of race relations in the United States" says co-author James Sidanius, professor of psychology and of African and African-American studies at Harvard. "Hypodescent against blacks remains a relatively powerful force within American society" (para. 5). "Ho (Arnold K. Ho) and Sidanius (James Sidanius cited above), along with co-authors Mahzarin R. Banaji at Harvard and Daniel T. Levin at Vanderbilt University, say their work reflects the cultural entrenchment of America's traditional racial hierarchy, which assigns the highest status to whites, followed by Asians, with Latinos and blacks at the bottom" (para. 6). This hypodescent concept is relevant to the information provided on Homère Plessy below, a fair-skinned New Orleans creole man who intended to help overturn an antiquated law pertaining to separation by race in public accommodations, which had not been in effect in the period immediately following Emancipation and the end of the American Civil War. Plessy's appearance suggested that he was Caucasian, but his ancestry was European and African; thus, as a person of color, he was prohibited by law from riding in the first-class "white" public train accommodations in the city of New Orleans. His contention with this law led to the landmark Supreme Court Case making segregation by race the law of the land in America.

22. The important legal case of Plessy versus Ferguson was the determining decision permitting the acceptance of the doctrine of “separate but [supposedly] equal” accommodations in public life, separating citizens in America and particularly in the South, according to socially accepted constructions of the idea of race. A summary of the case is provided at <http://www.lawnix.com/cases/plessy-ferguson.html> (accessed January 24, 2014), which is quoted virtually verbatim below, and which is noted under the heading, Summary of Plessy v. Ferguson, 163 U.S. 537, 16 S. Ct. 1138, 41 L. Ed. 256 (1896). The incident was precipitated on June 7, 1892, when “Homère Patrice Adolphe Plessy, a black creole in New Orleans attempted to sit in an all-white railroad car. After refusing to sit in the black railway carriage car, Plessy was arrested for violating an 1890 Louisiana statute that provided for segregated ‘separate but equal’ railroad accommodations. Those using facilities not designated for their race were criminally liable under the statute. At trial with Justice John H. Ferguson presiding, Plessy was found guilty on the grounds that the law was a reasonable exercise of the state’s police powers based upon custom, usage, and tradition in the state. Plessy filed a petition for writs of prohibition and certiorari in the Supreme Court of Louisiana against Ferguson, asserting that segregation stigmatized blacks and stamped them with a badge of inferiority in violation of the Thirteenth and Fourteenth amendments.’ The court found for Ferguson and the Supreme Court granted certification. The impact of the Plessy versus Ferguson decision was not truly mitigated until President Lyndon Baines Johnson, oversaw the passage of the Public Accommodations Act of 1964, which also is referred to as The Civil Rights Act of 1964 (Pub.L. 88–352, 78 Stat. 241, enacted July 2, 1964).

23. The essential definition of *melanin* is given at <http://www.medterms.com/script/main/art.asp?articlekey=4340> (Accessed January 24, 2014). It states: “The pigment that gives human skin, hair, and eyes their color. Dark-skinned people have more melanin in their skin than light-skinned people have. Melanin is produced by cells called melanocytes. It provides some protection against skin damage from the sun, and the melanocytes increase their production of melanin in response to sun exposure” (para. 1).

24. Logan’s works seem to embody an intentional visually seductive, yet, indignant and contentious Marxist-based (i.e., social justice and economic distribution considerations) approach to artistic expressiveness, aimed toward cultural transformation and public reflection on difficult themes pertaining to social structures, class, race, justice, and the promises of the American myth. (See Frank Martin’s 2014 online manuscript cited above in endnote #1.)

25. This observation is based on what is tantamount to a “confession” of pleasure in obscurity of intention offered by Logan in an interview with Xandra Eden, published

in the exhibition brochure, “Juan Logan: Without Stopping,” by The Weatherspoon Art Museum, The University of North Carolina at Greensboro, September 22-December 30, 2012. The interview was conducted from August 17th – 22nd, 2012. In the interview, Eden poses the question: “The colors and materials in your work are seductive; yet, the imagery leads us into some troubling territory. When someone reacts to your work as “difficult,” do you take it as a compliment or a critique?” Logan responded, “A very good question... Because I’ve never thought of “difficult” necessarily as a bad thing. I would probably take it as a compliment. It means that the viewer may be struggling with the image before them or doesn’t know exactly what to do with the information being put forward. Either way, it could mean that they are gaining new insight into an old subject, or are considering something they had not before, or it could simply mean that it makes them angry. Again, that’s not necessarily a bad thing.”

26. The works cited in the text may be seen by visiting Juan Logan’s website at: <http://www.juanlogan.com/untitledgallery#2> or by sending an inquiry to the attention of the artist. I would like to thank both Juan Logan and Jonell Logan for their support and input in generating this critical discussion of Juan Logan’s works.



**PART 3:
COLLEGE OF ENGINEERING
AND COMPUTING**

DEACTIVATION OF CAT ALLERGEN PROTEIN WITH ESSENTIAL OILS: A PRELIMINARY REPORT

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Every day in America, 44,000 people experience an asthma attack and 9 die [1]. The percentage of individuals with asthma in the United States is currently estimated at 8.2%, and that percentage increased markedly from 2005 to 2009, according to the National Center for Health Statistics [1]. The prevalence of doctor-diagnosed childhood asthma in the United States was estimated at 7% more than a decade ago [2]. Furthermore, children living in poor neighborhoods bear the highest burden of disease and are 4 times more likely to be hospitalized for asthma as children who live in wealthy neighborhoods. Asthma can be triggered by a number of factors. Of specific interest for this research is the inhalation of bioaerosols (i.e., biological triggers including allergenic proteins found in airborne household dust) [3]. Bioaerosols first accumulate and then are released from indoor reservoirs such as carpets and bedding. Common indoor allergen generators include dust mites, cockroaches, pets, and pests such as rodents. Data from the National Survey of Lead and Allergens in Homes

show that over 50% of homes have detectable levels of at least six indoor allergens, and nearly 46% had three allergens at levels capable of triggering asthma [3].

Domestic cats (*Felis domesticus*) are popular pets in United States homes. Even though 99.9% of homes have measurable levels of cat allergens, only 49.1% of homes had either a dog or a cat; yet, cat allergens are one of the major triggers of asthma worldwide [3]. Cat allergens are known to be adhesive, meaning that they stick to clothes and to very small particles that can become aerosolized. The highest levels of cat allergens are found in living rooms [4]. The dominant cat allergen, *Fel d 1*, is “found in saliva, the sebaceous glands, and pelts of cats” [5, p. 9690] and largely is produced in the saliva and sebaceous glands [6]. This protein is of an unknown function in the animal but causes an immunoglobulin (IgE, IgG) response (i.e., IgE antibodies produced by the immune system are found in the lungs, skin and mucous membranes, while IgG antibodies are the most common antibody found in all body fluids and are important in fighting bacterial and viral infections) [7]. Furthermore, both IgE and IgG antibodies are known to cause the body to react against foreign substances such as animal dander particularly in sensitive humans.

Essential oils are volatile and rarely colored liquids, lipid soluble and soluble in organic solvents with a generally lower density than that of water [8]. Franz indicates they can be synthesized by all plant organs (i.e., buds, flowers, leaves, stems, twigs, seeds, fruits, roots, wood, or bark) and are stored in secretory cells, cavities, canals, epidermic cells, or glandular trichomes. At present, promising approaches have been reported using

essential oils or components thereof in medicinal products for human or veterinary use [8].

Essential oils have several biological properties [9], such as larvicidal action [10], antioxidant [11], analgesic and anti-inflammatory [12], fungicide [13] and antitumor activity [14]. The *in vitro* antimicrobial activity of essential oils has been researched extensively against a variety of microorganisms [15].

There is a long history related to the plants used in treatment of human diseases [16]. For example, licorice (*Glycyrrhiza glabra*), myrrh (*Commiphora* species) and poppy capsule latex (*Papaversomniferum*) have a written historic record for being used in 2600 B.C., and these plants still are used in treatments either as part of a drug or as herbal preparations in traditional medicine [17]. Traditional use of plants as therapeutic tools, especially those with ethnopharmacological uses, serves as basis for their use in modern medicines [16]. According to a recent analysis, 80% of 122 plant-derived drugs are related to their original traditional uses [18].

As a basis for this work, a patent has been published that provides some evidence that cedar wood oil and hinoki oil are of potential value in deactivating some allergens [19]. Specifically, Hinoki oil and cedar wood essential oils can be used against one or both of the *Der p 1* and *Der f 1* cat allergens.

There also is some evidence that essential oils can act as an antimicrobial or antioxidant agent or can have a pharmacological effect on various tissues [20, 21]. Initially, it was reported that several essential oils could be emulsified in low concentrations in the laboratory detergent Tween

to form effective acaricides; however, Tween detergent is not available to the general public [21]. In a follow-up study, almost 20 years ago [22], Tovey and McDonald showed it is possible to make a simple, effective, inexpensive laundry acaricidal wash that eliminates the need for very hot water and also maintains low allergen levels in bedding for longer than normal laundering alone. The use of eucalyptus oil, which is a widely available essential oil, with a specific kitchen detergent concentrate forms an inexpensive acaricidal wash. Table 1, a recently constructed table

Table 1. *Eucalyptus Oil Concentration and Time on the Percentage of Mites Killed at Water Temperatures of 30° C* (Based on Tovey & McDonald, 1997 data)

Minutes	Control	5% treatment	10% treatment	20% treatment	40% treatment
7.5	20	30	35	35	40
15	15	35	30	45	70
30	25	50	50	75	90
60	15	20	70	85	90

summarizing the Tovey and McDonald results [22], clearly shows that more than 80% of mites were killed after immersion in a 20% oil solution for 60 minutes, while the 40% solution of eucalyptus oil yielded a 90% kill rate in only 30 minutes or more of treatment.

THE STUDY

Based on the review of research on use of allergens that trigger asthma and the use of essentials oils related to deactivation of the prevalent

household allergens of interest, four research questions were developed. The first is to determine the evaporation rate of tea tree, hinoki, cedar wood oils and N-decane as a control condition. Primarily, interest in this type of deactivation phenomena was due to a patented technology for allergy abatement in the home called “The CarboNix Triple Phase Treatment” (Carbonix, Inc., Columbia, SC) [23]. This method uses jets of air and dry ice powder to freeze dust mites in mattresses and carpet. The jets also loosen the dust triggers, which are then vacuumed away. This current research primarily is focused on essential oils in the hope that they could be used, perhaps, to prevent reinfestation and regrowth of cat allergens.

The second research question in this work is to determine which of these essential oils may inactivate the cat allergenic protein *Fel d 1*? The total µg of cat allergen per total gram of home dry dust is calculated to address the question.

The third research question is to determine if prolonged exposure to dry ice affects an Enzyme-linked Immunosorbent Assay (ELISA; Indoor Biotechnologies Inc., Charlottesville, VA) [24] response as compared to dry dust that is not exposed to dry ice. The allergenic concentrations of *Fel d 1* without essential oil are compared to address this question.

The final research question to be examined: Are there any statistically significant differences in reduction of the cat allergen for each essential oil as compared to each other? The total µg of cat allergen per total gram of home dry dust (for all samples) will determine a mean enabling comparisons between each of the three essential oils being tested.

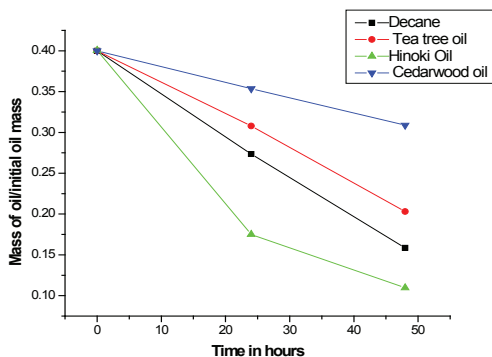
MATERIALS AND METHODS

An overall goal of this work is to test the hypothesis that an essential oil can inactivate allergenic proteins. Another hypothesis tested in this work is to determine if prolonged samples exposed to dry ice at -70°C will affect the ELISA response. The statistical analytical tool will be the t-test with the confidence level set at 95% ($\alpha = 0.05$). The Sandwich ELISA assay analysis [24] was the primary tool for evaluating the activity the cat allergen protein, yielding the experimental data.

Procedures

The evaporation rate on each oil was determined over three days. The mass of each oil / initial mass versus time in hours then was plotted as shown in Figure 1. N-decane was chosen as the control because of its

Figure 1. Comparison of 3 Essential Oils and N-decane Control Evaporation Rates



volatility, and its non-polar nature was anticipated to have the least effect on *Fel d 1*. Figure 1 shows that all oils and N-decane initially were at 40% concentration and that N-decane evaporation decreased to less than 20% over the time period specified. The plotted evaporation rates also indicate that over a two-day period Cedar wood oil appears to sustain the highest concentration indicating the least evaporation.

The Samples and Treatments

Dust samples were collected from a home with a known cat population by vacuuming, following the protocol recommended by the U.S. Department of Housing and Urban Development [25]. The samples were collected from rugs and carpet throughout the home. After vacuuming, the fine dust was isolated using a No. 45 mesh (355 μm) screen to remove large particles and fibers.

The dust treatment protocols are described below. Two 300 mg homogenous samples of fine dust with no essential oil were put into a closed vial and left to sit for 7 days. After 5 days, the vials were then put into a vacuum chamber at 30°C for 7 days to produce a dry sample. Six replicates were created of 100 mg of dry dust. Three of the six samples were then exposed to dry ice at -70°C for 5 days as a control.

Similarly, for the essential oil treatment, a homogenous sample of 300 mg of fine dust for each essential oil were put into a closed vial for 5 days. Decane ($\text{C}_{10}\text{H}_{22}$) was chosen as a control because of its volatility. After 5 days, the vial was put into a vacuum chamber at 30°C for 7 days to produce a dry sample. Finally, 100 mg of each essential oil were placed in a vial.

Three 100 mg replicates were created for each essential oil with N-decane serving as the negative control.

A description of the ELISA pre-treatment extraction follows. Each of the 18 samples were extracted by weighing out 100 mg (± 5 mg) fine dust into a 75 mm x 12 mm plastic test tube. Then 2.0 mL of PBS-T (i.e., 0.05% Tween 20 in phosphate buffered saline) was added to each sample, and then they were resuspended, using a vortex mixer. Next, the samples were placed on a laboratory rocker and mixed for 2 hours. Each sample then was centrifuged for 20 minutes at 2,500 rpm. Using a Pasteur pipette, about 1.5 mL of supernatant was removed for measurement of the antigen. Finally, the samples were stored at -20°C in a freezer vial with each sample labeled and coded. Sample extracts were analyzed by the Indoor Biotechnologies (Charlottesville, VA) Multiplex Array for Indoor Allergens (MARIA) analysis [26].

RESULTS

The concentration of cat allergen/total protein of dust sample are reported in μg allergen/g of dry dust. Table 2 shows significant reduction of

Table 2. *The ug of Cat Allergen/total grams of Dry Sample Dust*

Sample	Dry dust	Dry ice	Tea tree	Hinoki	Cedar wood	N-decane (control)
# 1	974.1	649.5	174.9	575.8	103.3	1,181.3
# 2	1,098.9	888.8	91.2	282.2	104.9	240.3
# 3	1,556.2	1,488.9	84.8	401.4	127.4	328.6
Mean (\bar{x})	1,209.7	1,009.1	116.9	419.8	111.9	583.4

concentration levels using essential oils (i.e., Means for essential oils range from 111.9 to 419.8 compared to 583.4 for N-decane with dry dust and dry ice means both >1,000).

The Table 3 results are shown for t-tests comparing means for samples of the remaining cat allergen per gram of dry dust present in treatments with each of the three oils (i.e., tea tree, cedar wood, hinoki), N-decane and dry ice only conditions. The *p* value for comparing the allergens remaining in the tea tree oil condition (\bar{x} =116.9) vs. the hinoki oil (\bar{x} = 419.8) is significant ($p<0.05$). Also, the lower level of remaining allergens in tea tree

Table 3. *Statistical Significance in Reduction of Fel d 1 Levels in Dry Dust for Each Treatment and Control* (One-tailed α -values for t-tests)

	Control	TTO	HO	CWO	DI	N-Decane
Control		0.016	0.034	0.011	0.057	0.14
Tea Tree Oil			<0.05	>0.05	<0.05	>0.05
Hinoki Oil				<0.05	>0.05	>0.05
Cedar wood Oil					<0.05	>0.05
Dry Ice						>0.05
N-Decane						

oil compared with dry ice alone (\bar{x} =1009.1) is significant ($p<0.05$). There also is a significant ($p<0.05$) difference in the comparison of hinoki oil allergen reduction (\bar{x} = 419.8) to that of cedar wood oil (\bar{x} =111.9). Finally, the cedar wood oil (\bar{x} =111.9) comparison with dry ice only (\bar{x} =1009.1) also is significant ($p<0.05$). Although none of the other statistical comparisons were significant, it may be noted (for purposes of future

research) that the dry ice comparison with both tea tree oil and cedar wood oil yielded a 0.08 probability level.

CONCLUSION

This preliminary study is part of an ongoing line of research that is focused on the steps of developing a technology that appears to be quite specific to a patented approach to deactivating specific allergens most prevalent in homes. Currently, another study is in process, in which n-decane concentration levels are being investigated related to the technology development of interest. Although it is not clear if essential oils reduce allergen levels, results have shown promise and are prompting continuing investigation.

Although there are limitations to every research study, using traditional t-tests for comparing multiple means generated from the same source did not yield definitive results. As a recommendation for future investigations in which data are generated from similar sources that are interrelated, perhaps, more advanced statistical analysis (e.g., multivariate types of analysis) may provide more definitive findings.

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**PART 4:
SCHOOL OF MEDICINE**

SEEDING MULTICELLULAR KERATINOCYTE SPHEROIDS IN 2-D MONOLAYER CULTURE ACTIVATES BASAL STEM-LIKE CELL PROGRESSION

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The stratified skin epidermis is a multilayer tissue maintained by constant renewal of suprabasal keratinocytes. During the process of epidermal renewal, regeneration is governed by a putative population of epidermal stem cells (EpSCs) found in the basal layer, the regenerative compartment of the skin interfollicular epidermis (IFE) [1]. In the basal layer, EpSCs remain small in size, stain positive for basal cytokeratins, and express intense levels of integrin alpha 6 (ITG α 6), which help uphold their attachment to the basement membrane [2-6]. During IFE renewal, basal EpSCs are primed to activation by environmental cues and divide to generate rapidly proliferating transit amplifying cells (TAC). The proliferating TAC subsequently leave the basal surface and initiate a stepwise differentiation to replenish lost suprabasal layers [1]. The activation of basal EpSCs is characterized by the co-expression of basal cytokeratin 14 and proliferative transcription factor P63, while EpSCs upward movement to suprabasal layers is associated with a loss of basal

cytokeratins and a gradual decrease in P63 intensity. During suprabasal differentiation, epidermal keratinocytes increase in size, lose basal keratins expression, and amplify the cellular EGF signaling through the induction of cell membrane EGF receptors (EGFR) [7-10]. At the later phases of differentiation, keratinocytes completely lose the expression of P63 and begin to express intense levels of involucrin, K10, and several other genes involved in the formation of the cornified envelop [11-13].

In most skin formation studies, epidermal renewal has been attributed to a discrete population of basal stem cells [1–4], but whether the IFE is hierarchically replenished by a single cell population that can switch between quiescence and activation, or whether it is stochastically carried out by several groups of committed progenitors (CP) is still being debated [5–7]. In normal tissue, the stepwise regeneration of the IFE is regulated tightly by cell attachment to the basement membrane; therefore, NHKc cell-surface detachment results in terminal differentiation, quickly followed by suspension-induced cell death (anoikis) [8, 9]. This phenotypic response also is accompanied with marked induction in EGFR expression [8]. Moreover, several studies by the research group with which this author is affiliated and others have demonstrated that dramatic increases in EGFR drive keratinocyte proliferation are poorly tolerated by NHKc [10–14]; however, lower expression of cell surface EGFR by keratinocytes is associated with quiescence, spheroid formation, and also has been attributed to epidermal keratinocyte stem cells [11, 15–17]. Consequently, distinguishing keratinocyte stemness often involves measuring cell surface EGFR levels and assessment of spheroid-forming abilities in 3-D

suspension culture [11, 18–20]. Despite few reports indicating that spheroid culture can improve skin progenitor function [21, 22], the effect of suspension spheroid culture on neonatal epidermal keratinocytes has never been investigated.

A 3-D cell-culture model, using a polymerized mixture of agarose supplemented with basal cell medium, was employed to investigate the cell behavior of 59 different NHKc strains isolated from neonatal foreskin samples. Only 40% of all NHKc strains were found to be capable of aggregating into multicellular spheroids innately when cultivated in culture, while 60% of the HKc strains failed to form viable spheroids in suspension. Spheroid-derived (SD) cultures displayed cellular heterogeneity and exhibited a marked induction of embryonic reprogramming factors within 24 hours in suspension culture. When transposed into 2-D plastic culture, adherent spheroids expressed a transcriptome signature corresponding to ectoderm commitment and epidermis reconstitution. Furthermore, SD cells operated in an orchestrated sequence of colony restoration, stained positive for nuclear P63 and basal cytokeratin 14, and were enriched for EGFR^{low} expressing cells. These findings reveal neonatal spheroid cultivation as an efficient method of enriching epidermal skin progenitors from newborn NHKc cultures, and it provides a powerful new tool for investigating basal stem cell activation.

METHODS

Cell Culture

Normal HKc (NHKc) were isolated from neonatal foreskin as previously described (3-Ackerman) and cultured in keratinocyte serum-free

medium (KSFM) supplemented with 20 ng/mL EGF, 10 ng/mL FGF, 0.4% BSA, and 4µg/mL insulin. This medium will be referred to as KSFM-stem cell medium (KSFM-scm) [23].

Spheroid Formation and Subcultivation

Cultured NHKc (2×10^4) were seeded into a 96-well round-bottom plate coated with a polymerized mixture of agarose (0.05%) and KSFM-scm. The spheroids were maintained for at least 24 hours in suspension until used for further experimentation. Suspension spheroids were transposed back into 2-D monolayer culture and allowed to generate cells (SD-NHKc). Proliferation SD-NHKc were trypsinized, assayed anew for spheroid formation, then newly formed spheroids were again transposed into 2-D monolayer culture to produce new secondary cultures. Cell size and morphology was determined by Lumenera's Infinity 1 software analysis (Lumenera Corporation, Ottawa, Ontario, Canada).

Clonal Growth Assay

Cells were plated in duplicate dishes at sub-confluent densities (10,000-20,000 cells/dish) in 100-mm dishes and were fed KSFM-scm every 4 days, until ~25% confluence, then fed subsequently every 2 days. Cultures were serially passaged (1:100) in 100-mm dishes until cell proliferative capacity was exhausted. Cell viability was obtained by the Countess Automated Cell Counter (Invitrogen, by ThermoFisher Scientific, Waltham, MA). Cumulative population doubling was calculated according to the formula: Population doublings = $(\log N / N_0) / \log_2$, where N represents the total cell number obtained at each passage and N_0 represents

the number of cells plated at the start of the experiment [24]. Matching dishes were stained with 10% Giemsa stain to assess colony size and morphologies.

Colony-Forming Efficiency Assay

NF-NHKc and SF-NHKc cultures were plated at 10,000 cells/dish in duplicate wells of a 6-well plate and fed once. Cells were fixed with methanol then stained with 10% Giemsa stain. Colony forming efficiencies (C.F.E) were calculated by obtaining the ratio of colonies generated from seeded cells to the original number of seeded cells. For the 2D-attached spheroid culture, C.F.E was determined by obtaining the ratio of colonies generated from each seeded spheroid to the original number of cells contained within the spheroid.

Real Time Phosphate Buffer Saline (PCR) Processing

Total RNA was isolated from cells using the All Prep DNA/RNA Mini Kit (Qiagen Inc. USA, Valencia, CA) according to the manufacturer's protocol. Reverse transcription was carried out with 1 µg of total RNA, using an iScript cDNA Synthesis Kit (Bio-Rad USA, Hercules, CA). Real-time Phosphate Buffer Saline (PCR) was performed using iQ SYBR Green Supermix (Bio-Rad) following the manufacturer's instructions. Amplicon products were validated by agarose gel electrophoresis (2% v/v). Glyceraldehyde 3-phosphate dehydrogenase (GAPDH) was used as an internal control. All samples were assayed in triplicate. The primer sequences used for real-time PCR are in a supplementary table (Available on request to author).

Immunohistochemistry

Cells were grown on cover slips coated with poly-lysine until 75% confluent. The cells were then washed twice in ice-cold PBS, fixed with 4% paraformaldehyde for 20 min at room temperature, permeabilized with 0.5% Triton and 1% glycine and then blocked using 0.5% bovine serum albumin and 5% goat serum for 30 min at room temperature. Samples were next incubated with antibodies against P63 (Thermo Scientific by ThermoFisher Scientific, Waltham, MA; 1:200 dilution) and cytokeratin 14 (Santa Cruz Biotechnology, Santa Cruz, CA; 1:200 dilution) in blocking solution overnight at 4°C. Samples were then washed three times with Phosphate Buffer Saline-Tween (PBST), which was followed by incubation with FITC- and Alexa 568-conjugated secondary antibodies (at 1:1000 dilution, Invitrogen by ThermoFisher Scientific). Nuclei were stained with 1:5000 dilution of 4', 6-diamidino-2-phenylindole (DAPI; Invitrogen) before cells were mounted. Samples were observed using a Nikon Eclipse E600 microscope (Nikon Metrology Inc., Americas) and a Zeiss confocal laser-scanning microscope (Zeiss International, Oberkochen, Germany).

Fluorescent Cell Mobility Tracking

The 2-D monolayer cultures were transfected with a plasmid vector carrying enhanced green fluorescent protein (eGFP). Cells were trypsinized and seeded (2×10^4) as 3-D spheroid suspension cultures. After 24 hrs., eGFP-expressing spheroids were transposed into monolayer 2-D cell culture. Cells were tracked with a Zeiss Axionvert 135 fluorescence microscope using Axiovision Rel. 4.5 software (HiTech Instruments,

Pennsburg, PA). The number of eGFP-expressing cells was measured by quantifying a calibrated pixel-by-pixel ratio between the green fluorescent image channel and the phase contrast image using ImageJ analysis (National Institute of Health, java-based public domain software).

Fluorescent Activated Cell Sorting Analysis

Cell cultures at a concentration of $2-4 \times 10^6$ cells/ml were stained with FITC-conjugated anti-integrin $\alpha 6$ (Abcam, Cambridge, MA) and PE-conjugated anti-EGFR (BD Pharmingen, San Jose, CA). Flow cytometry analysis was performed using a BD FACSAria II flow cytometer (BD Biosciences, San Jose, CA).

Microarray

Total RNA was isolated using the Qiagen RNeasy Plus Micro Kit according to the manufacturer's protocol (Qiagen Inc. USA, Valencia, CA). RNA quality was assessed using an Agilent 2100 Bioanalyzer (Agilent Technologies USA, Santa Clara, CA), and RNA Integrity Numbers ranged from 9.0 to 9.1. Microarray experiments were performed using Affymetrix's platform. Total RNA samples were amplified and biotinylated using a GeneChip WT PLUS Reagent Kit (Affymetrix, Santa Clara, CA). Briefly, 100 ng of total RNA per sample was reverse transcribed into ds-cDNA using NNN random primers containing a T7 RNA polymerase promoter sequence. Subsequently, T7 RNA polymerase was added to cDNA samples to amplify RNA, and then RNA was copied to ss-cDNA and degraded using RNase H; subsequently, ss-cDNA molecules were fragmented and terminally labeled with biotin. Amplified and labeled

samples were hybridized to GeneChip HuGene 2.0 ST Arrays (Affymetrix) for 16 hrs. at 45°C using a GeneChip Hybridization Oven 640 and a GeneChip Hybridization, Wash, and Stain Kit (Affymetrix). Hybridized arrays were washed and stained using a GeneChip Fluidics Stations 450 (Affymetrix). Arrays (6 total) were then scanned using a GeneChip Scanner 3000 7G system and computer workstation equipped with GeneChip Command Console 4.0 software (Affymetrix). Following completion of array scans, probe cell intensity (CEL) files (36 total) were imported into Expression Console Software (Affymetrix) and processed at the gene-level using Affymetrix's HuGene-2_0-st library file and the Robust Multichip Analysis (RMA) algorithm to generate CHP files. After confirming data quality within Expression Console, CHP files containing log₂ expression signals for each probe were then imported into Transcriptome Analysis Console Software version 3.0.0.466 (Affymetrix, Santa Clara, CA) to analyze cell type specific transcriptional responses using one-way between-subject analysis of variance.

Statistical Analysis

Spheroid-formation growth capacity was determined in 59 individual NHKc strains derived from different 1-day old neonatal foreskin explants. Data were expressed as the mean ± standard deviation (SD). Differences between mean values were analyzed using Student's *t*-test. Results of the 64 NHKc strains examined in the spheroid formation assay yielded 24 (40%) significant *t*-tests, while 35 (60%) were not significant.

RESULTS

Normal HKc Strains Derived from Different Individuals Display Varied Behaviors in Suspension Culture

To investigate the anchorage-independent growth potential of normal human keratinocyte strains (NHKc) derived from skin explants of various donors, cells were plated at a density of 2×10^4 cells/well in KSFM-scm in 96-well round-bottomed plates coated with a semi-solid polymerized mixture of agarose and KSFM-scm. Figures 1-2 show magnification of Neonatal foreskin explants that are processed to obtain normal human keratinocytes (NHKc) that are then seeded in individual wells of a 96-well plate. These explants were coated with a polymerized layer of agarose/KSFM solution that then was supplemented with 20 ng/mL EGF, 10 ng/mL FGF, 0.4% BSA, and 4 μ g/mL insulin.

Figure 1. *Cell culture reagents employed for the spheroid formation assay of normal keratinocytes.*

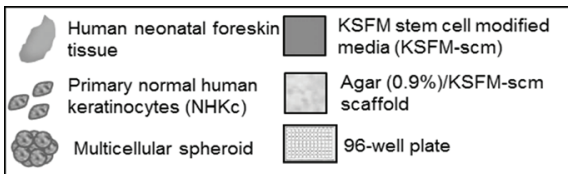
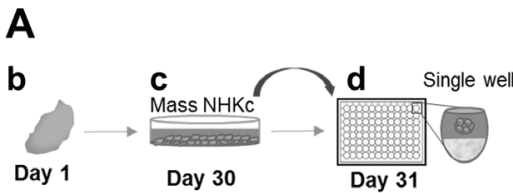


Figure 2 (b-d) illustrates the spheroid formation assay process over time, which is a 31-day process. Day 1 (image b) keratinocytes isolated from a fresh skin explants are cultivated in (image c) 100-mm polystyrene cell culture dishes. Day 31 (image d) cultivated cells are seeded in 96-well

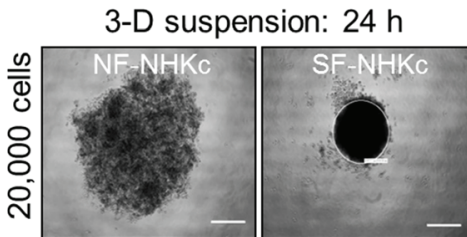
round-bottomed plates coated with a polymerized mixture of agarose and KSFM-scm that is used to generate single spheroid suspension of reproducibly sized spheroids in each individual well.

Figure 2. *Schematic of Spheroid Formation Assay with Normal Keratinocyte Cell Cultures.*



In this condition, cells grew as self-aggregating non-adherent three-dimensional spheroids of reproducible sizes. In Figure 3, two samples are shown of contrasting images of human keratinocytes after 24 hrs. in suspension culture. The image on the left is a spheroid non-former and on the right is a spheroid former (See related information in paragraph below the figure).

Figure 3. *Normal HKc strains Derived from Different Individuals Display Varied Behaviors in Suspension Culture.*

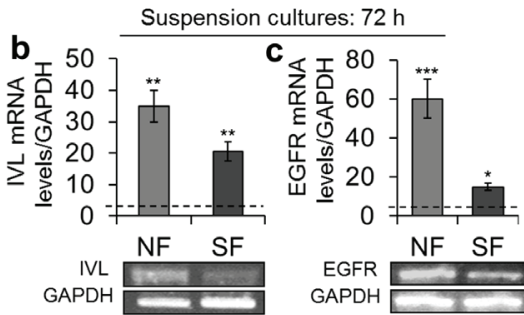


Suspension cultures from certain strains displayed an innate ability to aggregate into multicellular spheroids, while others consistently failed to self-assemble into spheroids throughout their time in suspension culture. To assess the status of cellular differentiation occurring in suspension cultures, mRNA levels of late-differentiation gene involucrin (IVL) were measured as well as the EGF receptor (EGFR) both in spheroid-forming NHKc strains (SF-NHKc) and spheroid non-forming NHKc (NF-NHKc) strains cultivated in suspension.

Findings indicate that suspension cultures from NF-NHKc presented a 35-fold upregulation of IVL mRNA compared to a 20.6-fold increase in SF-NHKc, relative to adherent monolayer mass cultures, which is shown in Figure 4. This marked surge in involucrin mRNA expression indicates that suspension culture considerably stimulated terminal differentiation in cells from both groups; yet, when EGFR mRNA levels were assessed, a 45-fold greater increase in NF-NHKc suspensions compared to SF-NHKc suspensions was found relative to levels found in monolayer mass cultures. These data demonstrate that suspension cultures from SF-NHKc were more resistant to suspension-induced differentiation than suspension cultures from NF-NHKc.

Figure 4 shows the results of PCR analysis of mRNA levels of cellular differentiation markers. As shown, Graph b (left side) represents expression levels of involucrin, and Graph c (right side) shows EGF receptor (EGFR) mRNA, in NF-NHKc (light gray) and SF-NHKc (light gray) cells after 72 hrs. in suspension culture, as determined by reverse transcriptase real-time

Figure 4. *Suspension Cultures from NF-NHKc Presented a 35-fold Upregulation of IVL mRNA Relative to Adherent Monolayer Mass Cultures.* (Bars indicate standard deviation, and *, **, and *** indicate statistically significant P values ≤ 0.05 , 0.01 and 0.001 , respectively.)

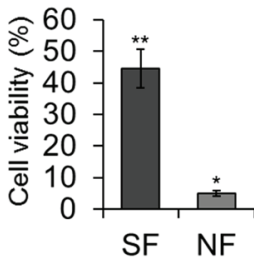


PCR relative to monolayer mass cultures. Dotted lines represent mRNA expression levels in monolayer mass cultures (Bottom). Amplicon products of each real-time PCR reaction were run on a 2% agarose gel and observed by ethidium bromide staining. Finally, data were normalized to GAPDH expression.

To determine the ratio of cell viability in NF-NHK and SF-NHKc suspension cultures, trypan blue-dye exclusion staining was used. Strikingly, results indicate that suspension cultures from SF-NHKc maintained significantly ($p < .01$) greater cell viabilities as compared to NF-NHKc (Figure 5). These findings indicated that some NHKc strains were better resistant to detachment-induced differentiation and detachment-induced cell death (i.e., anoikis). Cell viability in NF-NHKc and SF-NHKc suspensions after 72 hours of 3-D suspension culture was determined by

trypan blue staining. Bars indicate standard deviation and statistical significance for SF-NHKc values ($p \leq 0.01$) as well as for NF-NHKc values ($p \leq 0.05$), respectively.

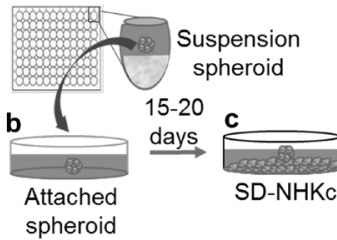
Figure 5. *Normal Multicellular Spheroids Maintain Cell Viability in Suspension Culture.*



NHKc Spheroids Produce Functionally Viable Colonies Despite Preceding Anchorage-free Culture

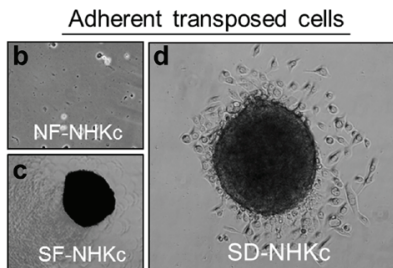
To challenge the anoikis-resistance observed in spheroid suspensions, tests were conducted of the functional viability of suspension cultures from SF-NHKc and NF-NHKc by transposing them back into empty 2-D polystyrene cell-culture dishes. The transposed suspensions from SF-NHKc readily attached to the cell-culture dish and gave rise to proliferating cells that formed several holoclonal colonies, while NF-NHKc gave rise to terminally differentiated cells that produced abortive colonies (Figures 6-7). Figure 6 is a schematic illustrating a suspension spheroid being transposed back into an empty uncoated 2-D polystyrene cell culture dish (image b). After 15-20 days the adherent culture gives rise to a monolayer of spheroid-derived cells that are cultivated and maintained in 2-D culture (image c).

Figure 6. *Schematic Depicting the Spheroid Re-Plating Assay in Culture.*



Functional analysis of individual NHKc strains isolated from 59 different human neonatal foreskin specimens revealed that most NHKc strains (60%) were incapable of self-aggregating into multicellular spheroids, while a smaller fraction of strains (40%) naturally formed spheroids that generated viable colonies when seeded in monolayer culture (Figure 7 below). NHKc strains examined through the spheroid re-plating assay show: Spheroid re-plating using NF-NHKc cultures (image b) and SF-NHKc cultures (image c). Finally, spheroid-derived cells can be seen

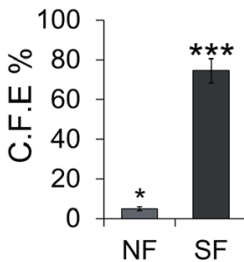
Figure 7. *Attached Multicellular Spheroids Regenerate Small-Sized Dividing Colonies in Monolayer Culture.*



proliferating from the 2-D attached spheroid in the d image (i.e., large image on the right). These observations then impelled research efforts toward better characterizing spheroid-derived cell populations.

Next, the colony forming efficiency (CFE) of transposed suspensions were examined by quantifying the ratio of Giemsa-stained colonies to the number of cells seeded. Results indicated that cells derived from SF-NHKc spheroid suspensions (SD-NHKc) were 74.5 times more efficient at generating colonies than transposed suspensions from NF-NHKc (e.g., increased density is shown in right side of the bar graph, exceeding the 70% level of C.F.E. ($p \leq 0.001$) as shown in Figure 8 below.

Figure 8. *Attached Multicellular Spheroids Produce Display Significantly Greater Colony Formation Efficiencies.* (Bars indicate standard deviation, and * and *** indicate statistically significant p values ≤ 0.05 and 0.001 , respectively.)

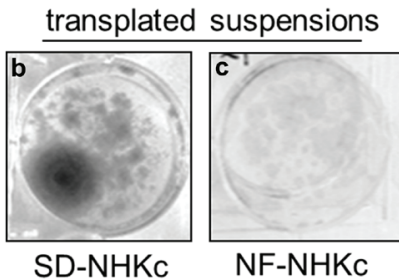


Spheroid-derived NHKc are P63/K14 Double-Positive Cells

To gain further insight into the growth potential of spheroid-derived NHKc (SD-NHKc) in adherent 2-D monolayer culture, extensive clonal analysis was performed using cells derived from transplanted SF-NHKc

spheroids and their corresponding monolayer mass cultures. Observations showed that small-sized cells proliferated from the spheroid to form a continuous monolayer sheet of cells. After several rounds of subcultivation in monolayer culture, SD-NHKc progenies maintained an increased colony forming efficiency (C.F.E., see Figure 8 above) undifferentiated phenotype similar to that of low-passaged cells; whereas, clones generated from mass cultures more readily acquired an elongated phenotype after 15 population doublings (PD) in culture (Figure 9). In Figure 9, this contrast is shown between giemsa-stained images of seeded suspension cultures from NF-NHKc (image b) and SF-NHKc (image c).

Figure 9. *Spheroid-Derived Cells Form Holoclonal Colonies in Monolayer Culture.*



To determine the basal epidermal status of SD-NHKc progenies, their nuclear expression of P63 and cytoplasmic expression of basal cytokeratin 14 (K14) were assessed by immunohistochemistry staining. Findings show that over 60% of SD-NHKc clones expressed nuclear P63 or basal K14, whereas less than 20% of clones from corresponding mass cultures

expressed K14, and merely 10% expressed nuclear P63. SD-NHKc cultures also contained 26-times more K14/P63 co-expressing cells, suggesting that SD cultures maintained a population of activated basal keratinocytes.

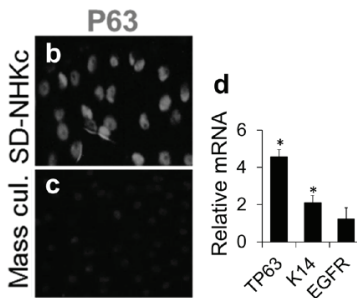
Spheroid-derived NHKc Maintain Sub-apoptotic EGFR Levels in Culture

Finally, the levels of mRNAs encoding pan-P63, cytokeratin 14 and EGF receptors (EGFR) were measured, finding a 4.6-fold increase in P63 mRNA levels and a 2.1-fold increase in K14 mRNA levels in SD-NHKc compared to their corresponding mass cultures. Interestingly, SD-NHKc expressed non-significant differences in EGFR mRNA levels compared to mass cultures;-thus, it was decided also to investigate cell-surface levels of EGFR in monolayer cultures. Fluorescence activated cell sorting (FACS) analysis revealed that cell surface EGFR expression increased over 100-fold in mass cultures after several serial subcloning processes, while levels in secondary cultures of SD-NHKc remained at sub-apoptotic levels. The intensity of cell surface EGFR seen in mass cultures also corresponded with a loss of spheroid formation, elongated cell morphologies, and cell senescence (Figure 10), which is indicated by the presence of flattened elongated cells. Whereas, secondary SD-NHKc cultures retained their spheroid forming abilities, accumulated more population doublings (PD), and displayed small-sized cells that could be subcultivated for over 10 weeks as monolayers.

As shown in Figure 10, gene expression changes presented by SD-NHKc (image b) and SD-NHKc (image c) indicate their corresponding mass cultures immunostained with antibodies against pan-tumor protein 63

(P63). The right side of the figure (image d) is the expression of mRNAs encoding pan-TP63, targeting all P63 isoforms, cytoke­ratin 14, and EGFR in SD-NHKc relative to corresponding mass cultures as determined by

Figure 10. *Primary Spheroid-derived Keratinocytes Display Basal Epidermal Features*



Real-time RT-PCR. Data were normalized to GAPDH expression and reported as mean +/- standard deviations. Results for TP63 and cytoke­ratin 14 reached the .05 level of significance.

These observations mirror previous studies depicting lower intensities of cell surface EGFR as a feature of stem-like keratinocytes and intense upregulation of cell surface EGFR, as a precursor of terminal differentiation in NHKc (e.g., LeRoy, et al. [11] as well as Wakita & Takigawa, [8]). Taken together, these data indicate that SD-NHKc yields a proliferating population of basal keratinocytes, resembling transit-amplifying cells (TA) of the skin epidermis.

DISCUSSION

In this study, findings demonstrate that certain strains of neonatal human keratinocytes exhibit many functional properties of EpSCs and intrinsically are resistant to suspension-induced cell death (anoikis) when cultivated in 3-D suspension. What has made newborn skin specimens unique for epidermis stem-cell studies is their inherently greater reserves of EpSCs and the virtual absence of genomic insults that frequently accumulate in adult tissue [27–29]. These attributes allow for more precise investigations of factors driving skin epidermal-cell activation in normal human tissue. In this study, certain NHKc strains consistently were shown to form-spheroids in suspension, while others consistently were incapable of aggregating into spheroids. Although major differences in colony-forming efficiencies between freshly-isolated primary cultures from spheroid forming (SF) and spheroid non-forming (NF) strains were not found, spheroid-forming ability was greater generally in primary cultures that expressed lower intensities of cell surface EGFR. These observations strengthen earlier reports by the University of South Carolina research group, exposing interindividual variabilities in NHKc EGFR levels [10], and they corroborate several findings describing EGFR^{low} expressing NHKc as spheroid-forming basal stem-cell keratinocytes [11, 17].

When replated in monolayer 2-D culture, surface-adherent spheroids generated small-sized cells that traveled to produced holoclone colonies. Colonies then fused to form epidermal sheets that expressed intense levels of proliferative marker P63 and basal marker K14, indicative of TAC cells primed for epidermal regeneration [30, 31]. Most likely, the attachment of

spheroids onto a plain 2-D polystyrene cell-culture dish is interpreted as a loss of “local confluence” [32, 33] by keratinocytes, which are triggering necessary programs for colony initiation and epidermal restoration. These findings corroborate the findings in earlier studies by Guo and Jahoda, which demonstrated that the attachment of keratinocytes onto a plain cell-culture surface stimulates progenitor cell activation and wound-repair [33].

At the very least, these results point to two distinct keratinocyte cell lineages: (a) a potent differentiation-resistant basal stem-like population that presents intense levels of K14 and produces holoclonal colonies in adherent culture as well as (b) the post-mitotic involucrin-expressing population that makes up the bulk of spheroid cultures and eventually forms a cornified-like ring of terminally differentiated cells. It also is possible that basal populations present within primary cultures are encouraged to revert to a less differentiated state during suspension culture, while already committed progenitors (CP) are precipitated into terminal differentiation. A precise ratio between EpSCs, early TAC, and CP may therefore be critical in calibrating the potency of NHKc spheroid-forming abilities and their differentiation penchants in culture. It would be interesting to explore how the addition of 3-D culture elements (e.g., collagen and feeder cells) will influence these processes.

The data reported here are in line with an increasing number of studies revealing evidence that progenitor cells can switch between quiescence and activation depending on microenvironmental signals and tissue regenerative needs [1, 4, 32, 34, 35]. Finally, these results are congruent with the increasing amount of evidence illustrating that 3-D cultivation of

mammalian cells can function as a reprogramming tool capable of reverting differentiated cells to a more primitive stem-like status [18, 23, 36, 37].

Taken together, these findings have many implications. First, the novel features exhibited by primary NHKc during 3-D suspension culture provide new insights into elements that influence basal-cell homeostasis and outlines the broad array of cell plasticity potentiated in a neonatal spheroid culture. Moreover, the fact that most EpSC investigations have been conducted in mice with a single genetic background makes human newborn skin studies such as this one a better representative of the genetic diversity found across human specimens. These distinctions may have a more significant impact on mammalian epidermal investigations than previously appreciated. For instance, the stark spheroid-forming differences seen in NHKc strains isolated from different newborn skin explants could be evidence of intrinsic, potentially congenital, traits influencing person-to-person propensities for epidermal cell renewal and basal cell activation. Further study would need to be conducted to better understand how these phenotypes are regulated and how they may affect predispositions to basal cell-mediated abnormalities such as neoplastic transformation.

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**PART 5:
ALUMNI CONTRIBUTION**

DISTRACTIONS IN DTC ADVERTISING: A CALL FOR MORE RESEARCH

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Consumers today are more proactive about their health than ever before (Avery, Eisenberg, & Simon, 2012; Wilkes, Bell, & Kravitz, 2000). These consumers, also dubbed “empowered consumers,” want complete information prior to decision-making regarding purchases and services (Blankenhorn, Duckwitz, & Sherr, 2001). Because this information expectation extends to healthcare products and services, these consumers are demanding more information about medical treatments (Kopp & Bang, 2000). They also believe that more medical information would give them more control over their health (Rosenthal, Berndt, Donohue, Frank, & Epstein, 2002).

Direct-to-consumer prescription drug advertising (hereafter, DTC ads or DTC advertising) is defined as “any promotional effort by a pharmaceutical company to present prescription drug information to the general public through consumer-oriented media” (Davis, 1999, p. 133); such advertising has become one source for information on various medical

conditions as well as on available treatments (Calfee, 2002; Macias, Pashupati, & Lewis, 2007). Since 1997, after FDC guidelines were published, consumers have been able to find DTC advertising on the internet, radio and television as well as in printed form (e.g., magazines) (Hartgraves, 2002). Of the four means of reaching consumers, pharmaceutical manufacturers have spent more advertising dollars on television ads than on all other types (Arnold, 2013). In 2014, these manufactures spent 61.6% of their advertising budget on television compared to 52.6% in 2011 (Millman, 2015).

Since the Food and Drug Administration (FDA) sanctioned DTC television advertising almost 20 years ago, pharmaceutical companies have increased overall spending each year. In 1998, they were spending \$664 million (Frank, Berndt, Donohue, Epstein, & Rosenthal, 2002) and spending rose to \$1.1 billion by 1999 (“DTC market...”, 2000; Frank, et al., 2002; Goetzl, 2000a). In 2000, drug marketers spent an estimated \$1.6 billion, an increase of 500% since 1997 (Jenkins, 2001). Last year, the industry spent \$3.6 billion (Medical Marketing & Media, 2016) up from \$3.2 billion in 2014 (Dobrow, 2015). Given this level of spending, DTC television ads have become ubiquitous, giving consumers ample opportunity for exposure to them. One study estimates that consumers watch as many as 16 hours of DTC television ads per year (Frosch, Krueger, Hornik, Cronbolm, & Barg, 2007), while another estimate reaches as high as 30 hours (Silver & Stevens, 2009). The typical consumer does not spend that much time with healthcare professionals during the course of a year (Ventola, 2011).

Ventola also purports that DTC advertisements dominate the health materials available to consumers.

Controversy regarding the impact of DTC advertising permeates the related literature, which includes proponents who generally have identified benefits to patients and medical practitioners and opponents who typically offer cautions related to the growing pharmaceutical companies advertising expenditures and the limited regulation of advertising practices. The purpose of this monograph chapter is to examine the research on DTC advertising to ascertain how both the existing benefits and the potential adverse impact on public health may be better understood. Also, researchers' calls for additional study of various aspects of DTC advertising will be discussed with specific emphasis on television advertising.

THE IMPACT OF DRUG ADVERTISING

In recent years, the acceleration in spending on pharmaceuticals “has become the fastest growing health sector” (Heffler, Smith, Keehan, Clemens, Zezza, & Truffer, 2004, W4-90), which Rosenthal, et al. (2002) suggest may be attributed to “an increase in the number of highly effective medications” (p. 498). They also caution in a citation of Wilkes, et al. (2000) that such increased spending “too often result[s] from more advertising of drugs that do not provide more effective or efficient care” (p. 498). Clearly, there is controversy regarding DTC advertisement of prescription drugs that may be clarified through carefully designed additional research.

The FDA has been governing prescription drug advertising since 1962 (Wilkes, et al., 2000); however, once the FDA provided the industry with

guidelines in 1997 (FDA, 1999a), DTC television advertising became prevalent. These guidelines require drug marketers to offer a brief summary of drug information *or* as an alternative, an “adequate provision” requirement (Hastak, Mazis, & Morris, 2001). The brief summary is the lengthy information found in the drug’s package labeling that outlines the side effects, contraindications, and effectiveness information (FDA, 1999a). Since the brief summary is too lengthy for a 60-second television ad, pharmaceutical advertisers choose to use the adequate provision requirement for broadcast ads. To meet the adequate provision requirement, drug marketers are required to present the most important risks *and* offer consumers a source for more detailed information (i.e., print ad, Internet web page, doctor, pharmacist, or toll free number) (FDA, 1999a).

Since these regulatory changes were made, DTC television advertising has become more prevalent, while policymakers continue to weigh the benefits and drawbacks of the practice. Proponents argue that the ads serve an educational purpose (Davis, 2007). They claim that these ads meet consumers’ intensifying demand for health information and, consequently, empower consumers to participate actively in the maintenance of their health (Goetzl, 2000b; Rosenthal, et al., 2002). Based on a content analysis of DTC advertising from 1989-1998, researchers concluded that these ads create the opportunity for candid discussions with doctors that otherwise may not occur by motivating consumers to visit the doctor more often and seek more information from their doctor (Wilkes, et al., 2000). In addition, Wilkes et al. indicate that the health industry has noticed a rise in the

frequency of physician visits as well as requests for tests. Many proponents would like to attribute this trend to DTC advertising.

Patients, whom these ads motivated to visit the doctor, also may discover that they have other conditions that require attention (Shapiro & Schultz, 2001). This is a positive outcome given that many major diseases (e.g., diabetes, depression, hypertension) that are treatable are considered as grossly underdiagnosed (Bonaccorso & Sturchio, 2002). One DTC study indicates that individuals who need treatment because they suffer poor health are more likely to discuss an advertised drug with their physician (The Henry J. Kaiser Foundation, 2001). Also, proponents argue that DTC ads make consumers more receptive to using prescription drugs (*Consumer Reports*, 2003); therefore, DTC advertising may increase compliance with treatment regimens also by serving as a reminder for patients (Everett, 1989; Rosenthal, et al., 2002). If this is the case, DTC advertising can impact potentially the 50% of patients who are receiving treatment currently for chronic diseases but are non-compliant (Bonaccorso & Sturchio, 2002).

Critics of DTC advertising suggest that the content of these ads may challenge consumers in various ways. They argue that DTC advertising is different than the conventional advertising that most consumers are accustomed to processing (Wilkes, et al., 2000). Unlike the commercials for other health-enhancing consumer products, DTC ads are required to comply with the fair balance requirement that necessitates the inclusion of both positive *and* negative consequences (i.e., side effects) of product use (Kaphingst, Dejong, Rudd, & Daltroy, 2004). The severity of the side effects ranges from the seemingly harmless like excitement, dizziness, or

dry mouth to the more severe such as potential liver damage, sudden bleeding, or death. Also, some of the side effects and complications may be unfamiliar to consumers. Compounding the complexity even more, these side effects are disclosed using language that may be difficult for individuals to interpret (Mapes, 1979; Ventola, 2011).

In addition to the issue of the complexity of these advertisements, opponents have another concern regarding the side effect disclosures. Industry experts believe that the mandatory side-effect disclosures give these ads credibility (Goetzl, 2000c). At least one study has indicated that a majority of consumers find DTC ads trustworthy (Goetzl, 2000c). Also, because many consumers know that the government regulates these advertisements, they may perceive DTC ads erroneously as scientific and authoritative (Tanouye, 1998). Consequently, consumers may have a false sense of security about DTC advertisements (Ventola, 2011). The truth is that while the FDA is charged with regulation of DTC advertisements, the agency lacks the resources to police these ads adequately (Ventola, 2011). Ventola asserts that “In 2010, the industry’s budget for DTCPA [direct-to-consumer prescription advertising] alone was reportedly twice the entire budget for the FDA” (p. 671).

DRUG ADVERTISING REGULATION RESEARCH

This adequate-provision aspect of regulation concerns many who contest DTC advertising, especially given the almost 66% drop in FDA warnings to drug marketers regarding misleading ads (*The Wall Street Journal*, 2003). They purport that consumers are confused regarding the degree to which the government protects them from misleading information

(Ventola, 2011). In a survey of 1600 adults' preferences for receiving drug information through DTC advertising, Wilkes, et al. (2000) learned that half of these respondents believed the government approved DTC ads *before* they are aired, and 43% believed the government allowed drug companies to advertise only "completely safe" drugs. In addition, 22% of respondents in the Wilkes, et al. study believed that the government had banned all drugs with serious side effects and allowed pharmaceutical companies to advertise only "extremely effective" drugs. None of these assumptions are true. A few recently well-designed studies (e.g., Niederdeppe, Byrne, Avery, & Cantor, 2013; Kim, et al., 2016) address some of these concerns. Medical journals publishing articles related to the controversy were at their highest in 2003, 2005 and 2007 (Procon.org, 2014), but apparently they have not made much of an impact on the issue of regulation adequacy or the problem of the public's misperceptions.

According to a recent summary of some DTC research findings, Ross and Kravitz (2013) propose a solution to the problem of accelerating DTC advertising that has minimal benefits to public health, serious risks to overtreatment, and few options for changes in the apparent narrow advertising focus on marketing strategies. Since there is still little research to illuminate the DTC advertising "pro" and "con" arguments with objective data, particularly regarding mitigating "their most harmful effects" (p. 863), these authors cite a 2007 proposal that has promise. Even though Kravitz and Bell (2007) proposed criteria for creating public health announcements and educational materials that could be developed by a consortium of experts from government, academia, and the drug industry that would

address safety issues and inform the public of data-based effective treatments and other related issues, apparently their proposed “way forward” and more recent research (e.g., Niederdeppe, et al., 2013) have not stimulated efforts to regulate DTC advertising more effectively.

In considering the need for more effective advertising regulation, a point that may be little known by the public is that the FDA and the drug manufacturers may not learn about all of the potential side effects until after a drug has been on the market for a while (Ventola, 2011). A Congressional report, revealing that 51.5% of new drugs sold in the United States (U.S.) between 1976 and 1985 were found to have severe or fatal side effects *after* the FDA approved them, supports this reality (Dilworth, 1990). After all, the population for which a drug is prescribed is much larger and more diverse than the controlled population on which the drug may have been tested; therefore, unforeseen reactions are likely to occur (Carpenter, 1978). Industry experts recently estimated that adverse drug reactions are the fifth leading cause of death in the U. S. (Ross, et al., 2011).

A more recent concern specific to DTC television advertising also is that it has been expanding rapidly (Macias, et al., 2007). Unlike print advertising, television advertising engages two different modalities (i.e., audio and visual) that can convey information simultaneously. Prior research suggests that when both modalities are sending the same message, learning is enhanced (Walma van der Molen, 2001); thus, television potentially is an effective medium of communication (Walma van der Molen & van der Voort, 2000). In the case of DTC television advertising, there is some evidence that this is too frequently the case during the benefit

segment of the commercial but not as frequently the case during the risk disclosure segment (e.g., Avery, et al., 2012; Kaphingst, et al., 2004; Sumpradit, Ascione, & Bagozzi, 2004). In fact, Harlow (2010) documents this evidence by including content analysis comparisons (e.g., on web sites, Macias & Lewis, 2003; in print, Macias, Lewis, & Baek, 2010; on television, Macias, et al., 2007) and even with survey data from adults of limited literacy (e.g., Kaphingst et al., 2004). Critics believe that this lack of congruency between the audio and visual information during the risk disclosures may violate the FDA's fair balance regulation (Harlow, 2010).

The FDA requires that product-claim ads offer a fair balance of benefits and risks (e.g., side effects, contraindications, warnings, and precautions). "An advertisement is considered to be in violation of the fair balance directive," if it "fails to present information relating to side effects and contraindications with a prominence and readability reasonably comparable with the presentation of information relating to effectiveness of the drug" (Davis & Meader, 2009, pp. 57-58). Some questions have been raised regarding whether DTC advertising is balanced (Macias, et al., 2007), particularly when the audio risks are paired with visuals that are incongruent with the audio. For example, the audio disclosure of risks often is paired with pleasant social scenes that include expressions such as smiling, laughing, hugging, and dancing. One academic researcher brought this issue to the forefront for policymakers in 2005 when she noted that the "background images often became more agitated or asynchronous with the voiceover during the presentation of the [risk disclosures]" (Arnold, 2012, para. 5).

The quotation below indicates that the FDA has been aware of this issue since 1999.

Many of [the] objections [to DTC television ads] were based on the presentation of distracting visual images in the background during the required audio disclosure of the advertised product’s major risks. The Agency was concerned that such distractions interfered with the adequate communication of required risk information... To date, [the] FDA has not objected to video presentation of the adequate provision disclosures simultaneously with the required audio presentation of the risk information (generally by a *voice over*). Historically, [the] FDA has believed that the simple processing needed to notice, read, comprehend, and process adequate provision video disclosures would not interfere with the processing of risk information presented in the audio (FDA, 1999b, p. 11).

Nonetheless, the FDA responded to the observations regarding the audiovisual dissonance during risk disclosures by publishing additional guidelines and conducting a study to examine the effect of visuals on comprehension of risk information. Their draft *Guidance for Industry: Presenting Risk Information in Prescription Drug and Medical Device Promotion of 2009* indicates that “[i]f visuals in a broadcast ad distract the audience from the statement of a product’s risks, the ad will not, as a whole, convey an accurate impression of the risks of the advertised product. This distraction could be caused by factors including busy scenes, frequent scene changes, moving camera

angles, and even inherently compelling, vivid visuals” (FDA, 2009, p. 20).

Additionally, the FDA launched a research effort dubbed the “Distraction Study” (Sullivan, 2012). The study looked at three factors: (a) the presence or absence of superimposed text; (b) the emotional-affective tone of visual images; and (c) the consistency of the visual images with the risk information. According to Sullivan (2012), “The results of the Distraction Study did not find support for the idea that consumers’ understanding of the risk information is influenced by the emotional (affective) tone of visual images or the consistency of the visual images with the risk information on the screen during the major statement” (Results of FDA DTC Study, para. 3)... ”Researchers confirmed that presenting risk information in text and audio simultaneously improves understanding but found that the tone and consistency of background images with risk information did not impair understanding as the agency had expected” (para. 6).

The DTC advertising phenomenon has been studied for decades as evidenced by some excellent early studies. For example, the 1997 randomized double-blind study that surveyed 147 adults to determine consumer preferences for ways of advertising prescription drugs from which Davis (1999) concluded that consumers are unable to interpret the risk information when imprecise language is used to describe the occurrence of side effects. Additionally, the impact of DTC advertising on doctor-patient relationships from the perspective of physicians also has been studied (e.g., Lipsky & Taylor, 1997). Of the 454 family physicians (52% of the sample)

who responded, 95% had experienced patient inquiries about specific drugs stimulated by DTC advertising; however, 84% of these physicians reported “negative feelings” about not only television and radio advertising but also regarding such advertising in print and media in general. Lipsky and Taylor found physicians’ most cited the advertising disadvantages (e.g., “misleading biased view” and “increased costs” [Abstract]), but some cited advantages (e.g., “better informed patients” and “promoting physician-patient communication” [Abstract]) as well as called for more studies of patient perspectives and cost-benefit analyses of DTC advertising. More recently, calls for research on the effective communication of information (e.g., Schwartz, Woloshin, & Welch, 2009) and for other potentially beneficial studies (e.g., Harlow, 2010; Kaphingst, et al., 2004; Macias et al., 2007) have not addressed the public or patients’ understanding of drug benefit and risk information adequately.

NEED FOR AUDIO-VISUAL COMPATIBILITY RESEARCH

Prior research related to the issue of mismatched audio and visual information can be found in the mass communication literature, warning compliance literature, and cognitive psychology literature. Some of this research examines this issue from a dual-coding theoretical perspective, while others rely on limited-attentional-capacity theory as the basis for research development.

The dual-coding theory purports that an individual exposed to audio and visual information converts the visual information into a visual code and the audio information into an audio code (Walma van der Molen, 2001). According to the findings of Walma van der Molen and Klijn (2004), when

the individual is required to remember this type of information, both codes are used when the audio and video information are related; however, in instances where the audio and visual information were not related, recall was lower. According to the dual-coding theory and the empirical research in this area, consumers exposed to a DTC commercial would be expected to have low recall of the side effect information in instances when the risk information is accompanied with unrelated visuals (e.g., Son, Reese & Davie, 1987; Walma van der Molen and Klijn, 2004).

According to the limited-attentional-capacity theory, an individual is believed to have a finite capacity to attend to stimuli (Kahneman, 1973; Wogalter & Leonard, 1999). The findings of Drew and Grimes (1987) and Grimes (1990) indicate that when the audio and visual information correspond, the individual has a greater capacity to process the information than when the audio and visual information is unrelated. In the latter instance, the individual would be expected to process the visual information rather than the audio (Grimes, 1990). Applying this theory to the context of DTC television advertising, the consumer would be expected to process the unrelated visuals because attending to and processing both the pleasant visuals and the bleak side effects simultaneously would exceed the mental processing capacity of the typical viewer.

Research, which is based on either theory, most likely would have similar findings in that when there is dissonance between the audio and visual information, processing of the visual information dominates. Studies that have relied upon either theory for development of hypotheses have found support for them (e.g., Drew & Grimes, 1987; Grimes, 1990, 1991;

Walma van der Molen & Klijn, 2004). Hence, the FDA results conflict with both theories and prior published research.

More research is needed to contribute to the existing body of knowledge and to inform policymakers on how to protect the public from DTC ads that may be misleading or easily misunderstood. If the DTC television ads are not providing consumers with balanced information about the benefits and risks of the promoted drug, the consequences could lead to inaccurate self-diagnosis, incorrect perceptions of illness risk and treatment efficacy, “overestimated drug benefit” conclusions, and provide “selective presentations of information” that leave consumers “vulnerable to persuasive marketing techniques” (Schwartz et al., 2009, p. 526). Researchers in this area have been critical of research methods used in DTC effects studies (e.g., Bodenheimer, 2003) and have called for more research on the topic of consumer comprehension of risk information in the presence and absence of distracting visuals (Harlow, 2010; Kaphingst, et al., 2004; Kaphingst, Rudd, Dejong, & Daltroy, 2005). Moreover, while scholars (e.g., Harlow, 2010; Kaphingst, et al., 2004; Macias, et al., 2007; Sumpradit, et al., 2004) have called for developing insights into this issue, there remains a paucity of research “...focused on provision of efficacy data or standards for provision of side effects data in print ads” (Schwartz, et al., 2009, p. 526) as well as in other aspects of DTC television advertising.

Direct-to-consumer advertising likely will not be discontinued given its protection by the First Amendment (Frosch, Grande, Tam, & Kravitz, 2010), and no one can predict if DTC television advertising will become more commonplace than it already is; however, based on advertising

spending trends of the pharmaceutical industry, this could be likely, which makes the need for a better understanding about how consumers process the risk information during risk disclosures paramount. Based on the literature reviewed, it seems clear that the FDA needs the impartial input from academicians in order to effectively do its job of protecting the public and properly regulating the industry.

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