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**Arizona State University  
Narrative Networks (N2) – Phase I  
Progress, Status and Management Report  
Quarterly Progress Report**

**Period Covered by the Report  
January 1, 2013 through March 31, 2013**

Date of Report: April 12, 2013

Project Title: Toward Narrative Disruptors and Inductors: Mapping the Narrative Comprehension Network and its Persuasive Effects

Contract/Grant Number: D12AP00074

Total Dollar Value: \$6,235,816.00

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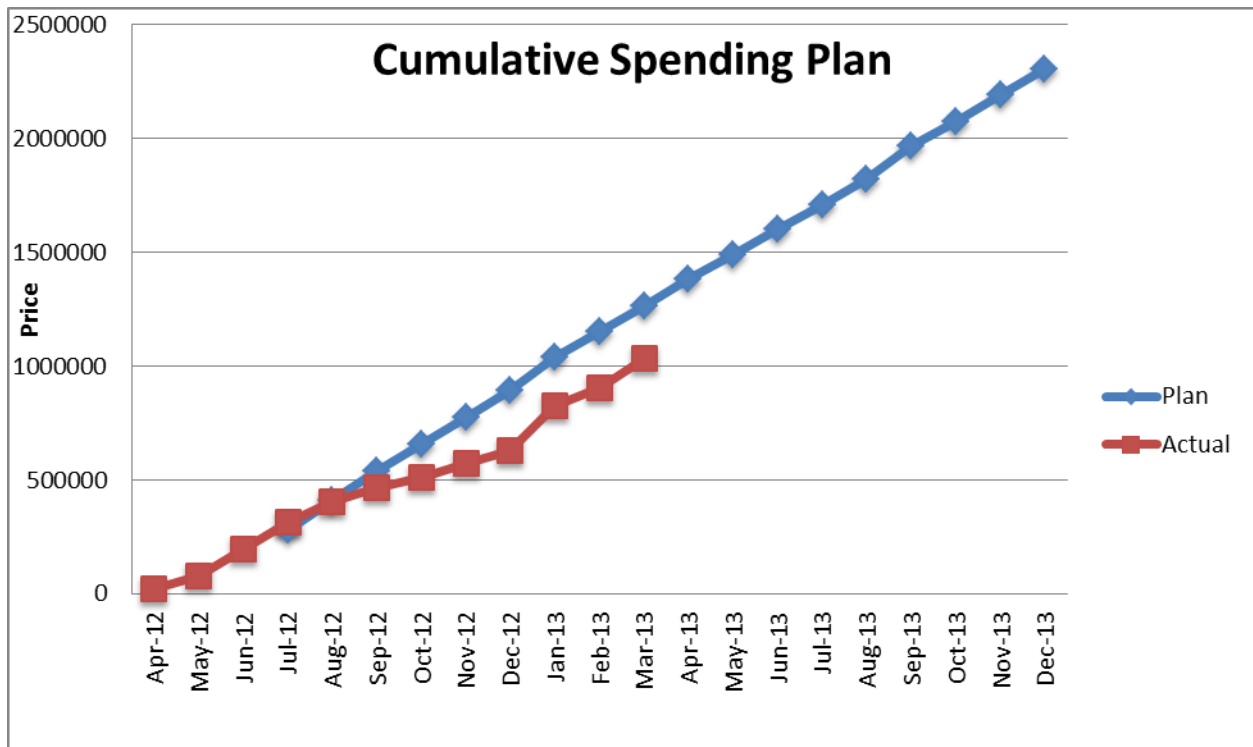
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## Technical Information – Financial Management

### 1. Technical Progress / Quarterly Expenditure Report (Please provide cumulative spending graph).

Figure 1. Cumulative Spending Plan



Please provide January to March 2013 schedule of tasks and events for this report period, with financial expenditures broken down by task.

Task 1.1 – Startup task \$205,315.36

Task 1.2 – Narrative Stimuli \$32,195.72

Task 1.3 – Persuasion Protocol \$99,664.53

Task 1.4 – Multi-model imaging \$42,942.97

Task 1.5 – Knowledge Capture and Write results \$2,093.63

Task 1.6 – Progress report \$23,580.59

Task 1.7 – Travel \$3,014.32

Total expenditures for the reporting period - \$408,807.11 (estimated)

Actual Cost versus Planned Costs

	<i>Current Cost (\$)</i>	<i>Total Phase 1 Cost (\$)</i>
Plan	\$368,026.00	\$2,303,196
Actual	\$408,807.11	\$1,035,605
Difference	\$40,781.11	\$1,267,591

**2. Technical Progress / Highlights – Observations**

**Overall Project**

We completed a successful site visit review just prior to this report. The project schedule is generally on-track and hitting milestones. We are slightly behind on some of the task items in our Gantt chart (related to pretesting of videos and persuasion measures), but this is because of incomplete information about workflow when the plan was created rather than problems per se in execution. We do not expect these things to impact the overall project schedule. In fact, we are in a position to accelerate the schedule for scanning subject, and are doing so in hopes of being able to report more scanning progress at the PI meeting in May.

**Narrative Team**

The narrative team made significant progress, initiating a theoretical research paper on vertical integration, and completing the custom stimulus materials (18 videos required by experimental protocol, 20 videos produced) to a final cut stage. The story, video tracks and audio tracks are locked and only minor, scanner specific adjustments (volume levels) remain prior to use in scanner experiment.

The video stimuli were created with the following design criteria: tell a coherent and understandable story of ‘local’ or contemporary relevance; master narrative affiliated videos to exhibit structural and/or thematic similarity with the relevant master narrative system; videos to be engaging with opportunity for viewers to identify with characters, situation, etc.; have some persuasive component, either exhibited by action in the video or by thematic element.

The design process of the videos began with identification of mutually exclusive master narratives to use as structural and thematic foundations for the affiliated videos. This step was accomplished with the assistance of Christian and Muslim SMEs. The production team then brainstormed suitable local narratives to adapt onto the master narrative structure/theme. Each writing team member brought six story ideas, and each idea was work shopped until identifying one that met the design criteria. Writing team member wrote a first draft, and then a professional screenwriter revised until the Narrative Team Leader (Co-PI Ruston) was satisfied. Unaffiliated stories, lacking a pre-existing master narrative to build on, began with a brainstorming session for an appropriate persuasion outcome, and the stories were built around that element in a similar process. This results in a closer association between the narrative arc of the unaffiliated video and its persuasion component.

Six representative videos (2 affiliated with Christian master narratives; 2 affiliated with Muslim master narratives and 2 unaffiliated videos) were used in a pilot study conducted during this reporting period. Results are reported in the Neuroscience and Persuasion teams’

reports.

### **Neuroscience Team**

This quarter the Neuropsychology Team began pilot data collection using fMRI and EEG as well as combining the two methods. We successfully acquired data from 5 participants including Dr. Casebeer on a pilot version of our vertical integration paradigm. Thus far, we have not encountered any health or comfort complications in acquiring simultaneous EEG/fMRI data. Also, we have been successful displaying the Narrative Team's movies in the scanning environment, which was previously an unknown and potential impediment to progress.

After acquiring the pilot data our Assistant Research Faculty, Zhen Yuan, was able to successfully analyze the fMRI data using some of his prewritten algorithms to distill linearly independent components contributing to the raw fMRI signal. Despite the theoretical approach, one component in particular showed strong onset with narratively meaningful events during the video. We are optimistic about this finding and are currently refining our data analytic program to ensure that we avoid a fishing expedition.

Finally, the Neuropsychology Team has added a new postdoctoral fellow, Chris Blais, Ph.D. Zhen comes to us from the Buffalo Medical School and he possesses expertise in multimodal data integration as well as fMRI and EEG data acquisition and analysis. Chris has already made very strong contributions in terms of experimental design and organization. He has also been engaged with Zhen Yuan in finding and developing algorithms for integrating the EEG and fMRI data.

### **Subjects Team**

We have obtained all necessary IRB approvals. For the out of scanner experiments (focus groups, quantitative evaluation of videos, and persuasion experiments), we have received ASU approval (via the exempt mechanism), and successful second-level review from USAMRMC. For the scanner (EEG & fMRI) experiments, we received approval from ASU and Barrow (both via the expedited mechanism), and again successfully obtained second-level review from USMRMC.

### **Persuasion Team**

The persuasion team regularly attended and actively participated in all full team, human subjects team, and the narrative team meetings to refine and improve our project. The persuasion team conducted the second persuasion pilot study during this reporting period. This study used a repeated measures, within-subjects design (i.e., all participants watched all six videos in a random order). In this pilot study we compared mean change scores (i.e., posttest score – pretest score = change score) for the three persuasion variables (behavioral intentions, attitude, and response efficacy) and to each other at the posttest (in the case of all nine variables under investigation, including the three persuasion variables). We started with a convenience sample of 184 participants (undergraduates from two communication classes), but conducted data analysis with only the 91 (or 49.5%) of participants who were raised Catholic or Protestant (i.e., since other religions were not represented enough to yield any meaningful comparisons). Results of this mini-study indicate that we have acceptable to high

measurement reliability (.74 to .95) for all nine variables under investigation (which was either consistent with or a substantial improvement over the first persuasion pilot study that was conducted last quarter). Unfortunately, results indicate that the tested videos did not have any significant effect on the three persuasion variables (behavioral intentions, attitudes, and response efficacy), though the results for attitudes tended to be in the expected direction. Further, while there were a few significant differences in the expected direction for two of the vertical integration variables (transportation and emotional engagement), there were either no significant differences or significant difference that were inconsistent with our hypotheses for all six vertical integration variables (transportation, emotional engagement, counter arguing, identification with characters, positive affect, and negative affect). Implications for this study and findings are discussed next under problems and solutions.

### **3. Results or Problems and Solutions**

#### **Narrative Team**

As noted above in the introduction, the videos require fine-tuning to improve their suitability for the scanner experiment. fMRI scanner noise creates a problem hearing the narration of the videos. This requires experimentation to identify an appropriate audio level that is audible for participants but that is not set so loud as to induce distortion in the audio headset. The pilot study conducted in March provided input for one adjustment of audio levels; two scanner subjects since that adjustment have reported acceptable hearing levels if the audio system in the scanner is set at maximum volume. One more adjustment should be all that is required. That basic story comprehension is negatively impacted by language proficiency. Those Focus Group participants that exhibited the least facility with English corresponded to those expressing the greatest amount of confusion about key plot elements. Proposed solution: remix audio of all videos to levels used in the pilot study; conduct one more round of adjustment to ensure all are clearly audible.

#### **Neuroscience Team**

The Neuropsychology has worked on handling the previous problems highlighted in the previous report. However, new problems are developing and we are actively engaging in solving these problems before they retard our progress. First, we are concerned that the total time in the scanning environment may cause fatigue and also create data quality issues. Therefore, we are reviewing our pilot data to see whether we can reduce the number of videos that participants will watch by a third without significantly reducing power. Second, we remain concerned that the scheduling at Barrow Neurological Institute will be tight in the summer so we are currently building an organizational chart (headed by our new postdoctoral fellow, Chris Blais) that will ensure two fully trained research assistants will be ready to collect data at a moment's notice. Third, given the abbreviated schedule for data acquisition and analysis (Summer and Fall 2013, respectively) we are developing a template for data preprocessing to ensure that our data is cleaned effectively and quickly so that it can be passed to our bioengineer, Zhen Yuan. Finally, while we are happy to report that Zhen has been offered a tenure track faculty position, we are slightly concerned that his absence could cause some impediments to progress. Zhen has completed all of his work in algorithm development and plans to continue having a presence in the grant but there will be no substitute for him being in the lab. Zhen plans to leave in August and we are currently preparing by having Zhen train our new postdoctoral fellow, Chris Blais, and our graduate

students, Kim Talboom and Hunter Ball. Also, Zhen is preparing a user manual for all of the algorithms that he has developed which we will review in multiple lab meetings leading up to his move.

### **Subjects Team**

We have created a prescreening questionnaire for subject recruitment which assays participants' cultural, demographic, and religious backgrounds, and their suitability for scanning experiments (viz. any medical condition or issue which would preclude safe scanning, handedness, etc.). We also measure English fluency.

We have advertised this to Psychology 101 students, calling and emailing all Christians, Hindus, and Muslims; and done similarly with relevant campus and community religious organizations. On 10 April, Dr. Cohen made a similar announcement to the psychology research pool at ASU Polytechnic's campus, which has a greater representation of minority religious communities.

On 4 April, Drs. Cohen and Corman met with Mr. Usama Shami from the Islamic Cultural Center of Phoenix, and the meeting was very positive regarding potential subject recruitment.

So far, out of 156 participants who have so far taken the survey and indicated a relevant religious background (Catholic, Protestant, Hindu, or Muslim), we have 47 Protestants, 13 Catholics, 28 Hindus, and 14 Muslims. Removing English as a native language would greatly facilitate recruitment. We are currently following up with Hindus and Muslims about possible medical exclusions (e.g. if they indicated some kind of surgery, to find out which kind and if they are acceptable to be safely run).

Having looked just at the Muslims this way, 2 are now completely acceptable, 3 are definitely unacceptable, 3 are definitely acceptable if we waive the ESL issue, and 6 need follow up by Dr. Baxter's team to assess medical suitability. Also, we have called and emailed several ASU and local Muslim organizations, and had a positive meeting last week with ICCPAZ, the Islamic Cultural Center of Phoenix, regarding advertising the experiment.

### **Persuasion Team**

Persuasion Team Problems and Solution 1: The persuasion team only had six final-cut videos to test when conducting the second persuasion pilot study. Thus, the persuasion team was not able to test as many videos as we hoped during the reporting period. Now that we have the logistics of the pilot study process worked out and all measures selected, we should be able to conduct them fairly quickly in the future if need be and assuming we have enough subjects.

Persuasion Team Problem and Solution 2: Unfortunately, we have consistently found that the first eight *individual* videos have no or few effects on the persuasion or vertical integration variables. Further, since the videos are now complete, it will not be possible to change them at this time. That said, it should be noted that it is possible we may find more effects when we begin studying *multiple* videos that deal with a single general topic rather than each individual video. Further, during the second pilot test we noticed a few potential wording

issues for some of the variables, and it is quite possible that adjusting the wording of these items to more accurately reflect video content might also yield better results. So, the persuasion team will work with the narrative team to help minimize these potential wording problems in the future. Nonetheless, we do have concerns about showing persuasive effects at this point, especially in terms of behavior change (though pilot test results suggest it is at least possible we will find persuasive effects on attitudes, as well as vertical integration effects on transportation and positive affect).

Persuasion Team Problem and Solution 3: Data collection for the main scanner study has been expedited so data collection can begin as soon as mid-April. This means we will not be able to pilot test the remaining videos for use the main outside-the-scanner study to inform the main scanner study as originally intended. Instead, we will base item selection on the information gathered using the first eight videos that were included in the first and second pilot studies.

#### **4. Significant Accomplishments Anticipated During Next Reporting Period**

##### **Narrative Team**

Publish a theoretical paper on vertical integration suitable for submission to an accredited and peer-reviewed academic journal in the field of communication.

Publish a shorter essay targeted at a military/practitioner audience on the application of vertical integration, narrative arcs, and coherence and fidelity in information operations and strategic communication.

##### **Neuroscience Team**

Collect pilot data

Find preliminary results that are consistent with narrative comprehension

Hire a new team member, Chris Blais

Planning for potential problems

Creating a template for streaming data acquisition and preprocessing

Learning how to implement Zhen's algorithms

##### **Subjects Team**

Successful recruitment for scanning 20 Christians, 20 Hindus, and 20 Muslims for Phase 1.

Successful recruitment for the out of scanner experiments for Phase 1: 60 Christians, 60 Hindus, and 60 Muslims.

##### **Persuasion Team**

Conduct additional data analysis on the pilot test data. For example, five Muslim and three Hindu individuals participated in the second persuasion pilot study, and we feel it is worth looking at their data to see if anything helpful can be learned. Also for example, we can look for difference between Christians and those who were not religious (which made up approximately 20% of the sample).



Conduct additional outside-the-scanner pilot studies as requested by the other teams to test additional videos.

The persuasion team, with the help of the narrative team, will select measures for the expedited in-the-scanner study based on information learned about the eight videos from the two pilot studies that have been conducted to date.

The persuasion team should be able to finalize the study protocol and begin collecting data for the main outside-the-scanner study during this next quarter, or once all videos and participant selection and recruitment procedures are complete.

## **5. Publications (relevant effort)**

There have been no relevant publications during the reporting period.

## **6. Meetings and Events (please include meetings with subcontractors if applicable)**

- Weekly all-hands meetings
- Weekly team meetings

## **7. Other**

We are in discussions with the MIT team about getting the Phase I videos coded in Story Workbench (SW). This is a challenge because significant narrative information is conveyed by visual and auditory aspects of the videos that cannot be readily annotated in the SE. So we are working on a means to convert these aspects of the video into text in a valid way.