

## **A Comparative Study of AI and Human-Generated Health Advertisement Video Appeal**

Amala Elangovan and John Leddo

MyEdMaster, LLC

Leesburg, Virginia, USA

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### **ABSTRACT**

*This study investigates whether AI-generated advertisements for health and longevity products elicit comparable audience persuasion as human-made advertisements. Using invideo.ai, AI-generated advertisements were created from transcripts of four real health product videos, selling an assistive device, supplements, a skin cream, and a lifestyle app. 18 participants rated each ad on product relevance, purchase likelihood, and free-trial acceptance. Results indicated no significant difference between AI and human-generated ads across most questions, except for higher free-trial interest in the human ad for the assistive device. This suggests that AI could match human capabilities in producing persuasive health advertisements; however, viewers may prefer human-made content for unfamiliar or complex products. The findings underscore AI's potential in cost-effective advertisement production but are also a cause for concern about its misuse.*

### **Introduction**

Before the recent surge in the popularity of Artificial Intelligence (AI), simple models had already been applied as commonplace in a wide range of fields, such as in 2002 when Roombas were created, or in 2011 when Apple introduced the virtual assistant Siri (“What Is the History”). One of the more prominent examples of this technology is Natural Language Processing (NLP), which is a subset of AI focused on building algorithms capable of comprehending (Natural Language Understanding) and recreating (Natural Language Generation) realistic human speech and writing. Thus far, Natural Language Understanding (NLU) has been more prevalent due to its large applications in information summarization and textual analysis; however, as these AI models improve, NLP’s ability to generate language (NLG) is gaining traction. One such way the technology is being applied is through script writing and video production (Khurana et al., 2022).

As NLP can both comprehend and generate, when given a prompt these models can create a script and then read their own scripts to match them with corresponding video clips.

One potential application of this self-sufficient process could be producing advertisements for health and longevity products. On average, producing just 30 seconds of an advertisement costs upwards of \$1,000 (Chaves, 2024). This number is especially on the higher end in the health industry, as a study in the *Journal of Business Research* assessed product advertisements to have larger audience impacts when showcasing results with imagery rather than simply making claims (Chrysochou and Klaus, 2014). In the longevity sector specifically, imagery of results would require the additional costs of employing paid actors. When considering the added costs of buying engagement online, smaller health start-ups can become swamped with the costs of producing online marketing; therefore, we turn to AI as a potential solution.

Through previous studies, we have understood AI to be on par with humans in terms of generating health-related content, as it could generate videos that equally influence audiences' trust and engagement (Elangovan and Leddo, 2024). In this study we aim to further that understanding by determining if the persuasion health product advertisements garner with audiences would hold with those generated by an AI video production model.

## **Method**

### ***Participants***

The experiment consisted of 18 participants. 3 of these respondents were known to be South Asian females ranging from 38 to 50 years old. The other 15 were the parents of middle school and high school students participating in a machine-learning research class. No participants were compensated for their participation.

### ***Materials***

The original advertisements and transcripts were sourced from YouTube, with our search prioritizing those with higher view counts and shorter lengths (under 2 minutes). We decided to replicate the advertisements of four types of health products: an assistive device, supplements, a skin cream, and a lifestyle app. Respectively, the videos were:

1. "What is the NanoVi Treatment? What Does the NanoVi Do? NanoVi Therapy & Machine Benefits Explained!" (NanoVi Device for Anti-Aging, Wellness & Recovery) - <https://youtu.be/QB9SvM58QVw?si=W5gJkDSCPyD-zvwa>
2. "Neuro-Mag® Magnesium L-Threonate" (Life Extension) - <https://youtube.com/shorts/ox4e9KrkQkQ?si=7QzH7LxyIBfqNHbp>

3. "INNOVATION | Anti-Age Global" (Yves Rocher USA)  
- <https://youtu.be/QI86ojRaksk?si=2JGSuD4RlmyAciPT>
4. "Find Longevity - Eat Well and Shop Well (Assuaged App)" (Assuaged).  
- <https://youtu.be/MsRoAnw3GjQ?si=VPGIu5e6MD71YreN>

This product spread aimed to ensure participants had at least one product that was relevant to them.

We then utilized the AI video generation site [invideo.ai](https://invideo.ai), which generates videos using stock footage and voice presets using prompts inputted by users. In place of prompts, we copied the transcripts of the four original videos provided by YouTube into [invideo.ai](https://invideo.ai). To account for the lack of a caption option on our videos, we added the instruction "add default white subtitles with no animation". For the purposes of this experiment, a premium account was purchased so that footage was unmarked and participants would not be able to discern the video's source.

Questions asked after the videos aimed at quantifying respondents' opinions using a Likert scale of one to seven. The same three were asked after every video:

1. How relevant is this product to you?
2. How likely are you to purchase this product for [price]?
3. If offered a free trial for this product, how likely are you to take it?

Since the Assuaged app is already free, only the first two were asked after the app's advertisements. This also served to gauge which of our participants would simply take a free trial for the benefit of not paying.

The overall purpose of these questions was to gauge the viewers' reactions to the videos based on their persuasions about the product. The videos and questions were finally compiled into two surveys using Google Forms. Rather than allocating all AI advertisements to one form and human-generated to another, we opted to alternate the types in each form so that all participants viewed 2 AI advertisements and 2 human advertisements.

### ***Procedure***

All participants received the same script before participating: "You will be watching four health product advertisements and asked three questions per product; the whole survey should only take around 10-15 minutes. Please answer all of the questions in one sitting so that you retain the video's contents. Thank you for your participation!" Participants were randomly sent the link to either the first or the second Google Form.

**Results**

The first form received 11 responses and the second received 8. During analysis, one respondent’s scores from the first group were removed as outliers, as the participant responded with a one to every question; therefore, the sample sizes should be treated as 10 and 8. Below are tables of the respondents’ means for all 3 question in both forms,

Assistive Device (means)		
	AI (invideo.ai)	Human (NanoVi)
How relevant is this product to you?	3.88	4.10
How likely are you to purchase this product for \$6,300?	1.63	2.30
If offered a free trial for this product, how likely are you to take it?	3.63	5.30

Supplements (means)		
	AI (invideo.ai)	Human (Neuro-Mag)
How relevant is this product to you?	4.60	4.83
How likely are you to purchase this product for \$30?	4.40	4.00
If offered a free trial for this product, how likely are you to take it?	5.30	4.25

Skin Cream (means)		
	AI (invideo.ai)	Human (Yves Rocher USA)
How relevant is this product to you?	4.13	4.80
How likely are you to purchase this product for \$39?	4.00	4.40
If offered a free trial for this product, how likely are you to take it?	5.63	4.30

Lifestyle App (means)		
	AI (invideo.ai)	Human (Assuaged)
How relevant is this product to you?	4.10	3.63
How likely are you to download this free app?	4.60	3.25

In a t-test comparison on the same questions across the two forms the df was 16 for all questions and there was no statistical significance in all responses except one. The one question that showed a statistically significant difference was for the assistive device video's question "If offered a free trial for this product, how likely are you to take it?" where  $t = 2.1300$  and  $p = 0.049$ .

We also combined the responses from the AI and human-generated videos to correlate the values to those of different questions. The results are as follows:

Assistive Device Videos:

- Questions 1 and 2:  $r = 0.4303$ ,  $df = 17$ ,  $p < .1$
- Questions 1 and 3:  $r = 0.4131$ ,  $df = 17$ ,  $p < .1$
- Questions 2 and 3:  $r = 0.5020$ ,  $df = 17$ ,  $p < .05$

Supplement Videos:

- Questions 1 and 2:  $r = 0.7275$ ,  $df = 17$ ,  $p < .001$
- Questions 1 and 3:  $r = 0.8294$ ,  $df = 17$ ,  $p < .001$
- Questions 2 and 3:  $r = 0.8922$ ,  $df = 17$ ,  $p < .001$

Skin Cream Videos:

- Questions 1 and 2:  $r = 0.8632$ ,  $df = 17$ ,  $p < .001$
- Questions 1 and 3:  $r = 0.7048$ ,  $df = 17$ ,  $p < .001$
- Questions 2 and 3:  $r = 0.8458$ ,  $df = 17$ ,  $p < .001$

Lifestyle App Videos:

- Questions 1 and 2:  $r = 0.7569$ ,  $df = 17$ ,  $p < .001$

The between-items correlations were all statistically significant, except for the correlations between Question 1 and the other two questions in the Assistive Device Videos for which the correlations approached significance. Not surprisingly, there was a high relationship between a product's relevancy to the viewer, their willingness to buy it, and their inclination to opt in for a free trial. While there were strong relationships between relevancy and willingness to opt-in for a free trial, since only correlations were calculated, the direction of causality is unclear. While it could be that people are more willing to experiment with products that pertain to themselves, there may also be other dynamics such as economic factors at play. Further research with more nuanced questioning is required to gain a better understanding on what most impacts this population.

To understand whether an advertisement's source had any impact on the individual respondents, we compiled their respective responses to human and AI prompts for each participant and calculated those means to create the average score they gave both video sources. This was possible because, on our Likert scale, a lower number consistently represented a negative view and a higher score a more positive one. Additionally, we ran 2 separate unpaired t-tests on the means of human and AI scores from respondents in group 1 to those of respondents in group 2, and found there to be no statistical significance (Human:  $p = 0.6420$ ,  $t = 0.4738$  and AI:  $p = 0.2769$ ,  $t = 1.1258$ ) which allowed us to combine the individuals in groups 1 and 2. The mean of each individual's human means was 4.0444, and the mean of their AI means was 4.2500. This final paired t-test revealed no statistical significance ( $p = 0.3195$ ,  $t = 1.0255$ ,  $df = 17$ ) between the average scores an individual gave to human-generated vs. AI-generated advertisements.

## **Discussion**

This experiment aimed to determine if AI-generated health product advertisements could replicate the same response human advertisements inspire in their audiences. The results of our surveys found that almost all recorded aspects of viewer persuasion by the videos were unchanged by the source. While there was mostly no statistical significance in our data, the fact that the means were so similar implies that AI can create advertisements that are just as good as humans in the eyes of this audience.

In the case of statistically significant responses, scores leaned in favor of the human video created for the NanoVi when participants were asked "If offered a free trial for this product, how likely are you to take it?" This could be attributed to the fact that NanoVi's technology is not well-known and familiar to the public like supplements and skin creams are. When being introduced to new healthcare technology, especially one with such extensive claims, audiences may be more likely to trust or understand an advertisement with human testimonials rather than the pure facts and stock footage an AI generator can offer. Therefore, in the instance of innovative healthcare technology, businesses may find more success in opting with human-generated advertisements for a more familiar introduction to their products.

Nevertheless, through these findings it is evident that AI is at a point where anyone can create health product advertisements on par with those of humans. For businesses, this could mean that editing and even recording marketing content are obsolete processes, as the AI could recreate the results of their videos with just a script. Of course, in this experiment, the benefits of this technology's power were examined as it was used to advertise factual information about products to viewers; however, there are cases where the content could change and be used for harm. Since the viewers' belief was so high regardless of the source, and access to AI video

generation is common, anyone could make high-production advertisements with little effort, which would convincingly spread misinformation or slander to unassuming audiences.

In the future, as this technology continues to evolve and improve, it is vital that audiences are educated in how to identify the source of content they consume, regardless of the advertiser's intent.

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