Cinematic Transmedia: A Physiological Look at Engagement with Marvel's Cinematic Universe as Measured by Brainwaves and Electrodermal Activity

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Dedication: This thesis is dedicated to my dog, Shakespeare, who sacrificed many trips to the park, and had to deal with my odd hours at night.

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Abstract

This study looks at engagement levels within the Marvel Cinematic Universe (MCU) at physiological and neurological levels, and with self-reported measures. One show or movie in each of three categories of Marvel media (a movie, television show, and streaming show) were shown to participants who then had their brainwaves and galvanic skin response recorded to determine whether or not they were engaged with the transmedia aspects of the MCU. Results showed that participants were consistently engaged with the transmedia throughout all three media types, with brainwaves varying only slightly between each content. The Marvel movie, "The Avengers" was most engaging to participants who had their brainwaves and galvanic skin response rates recorded, while participants in a control group consisting of only a survey agreed with the finding that movies in the MCU were the most enjoyable and were able to keep their interest the longest. There were significant findings between ratings of television shows and engagement with each of the three media types for participants in the control group.

Cinematic Transmedia

Recently, transmedia storytelling has gained popularity amongst both communication and film scholars alike. The forging of multiple characters with either different or intermingling stories into the same fictional universe is relatively new considering the millennia of previous storytelling techniques. Despite this, the usage of the word transmedia has managed to expand across several platforms, with usage varying from actual media technologies to that of storytelling.

For this particular study, unless otherwise noted, transmedia will be defined as the telling of a story experience wherein the actions of one character can affect the world, plot, or story structure of characters in a separate story in a different medium, or the instance when a character from one story can cross over into the world of another character, interact with said character, and have the repercussions of his or her actions in this separate story affect his or her own storyline.

While interest in the collaboration of characters within the same cinematic world has been steadily growing, researchers are primarily studying such concepts in the scope of communication, film, or storytelling. Their primary method of study focuses in on qualitative and content analytical research, leaving their conclusions to a theoretical and subjective interpretation. The lack of research on a scientific, quantitative scale leaves the study of transmedia at a disadvantage to some of the better established cinematic theories backed by empirical data.

While the concept of transmedia has yet to be developed to the point where separate forms of it exist, the general acceptance of cinematic transmedia has begun to take root in popular culture. The recent success of the Marvel Cinematic Universe (MCU) has begun to

intrigue communications and storytelling scholars and help to propitiate this particular "genre" of transmedia.

Beginning with the 2008 film "Iron Man," Marvel began laying the groundwork of its transmedia storytelling world by including a post-credit scene which introduced Samuel L. Jackson as Nick Fury, the leader of the Avenger's Initiative. Immediately following the release and success of "Iron Man," Marvel continued developing its first phase of creating transmedia storytelling by announcing three upcoming titles — "Iron Man 2," "Thor," and "The First Avenger: Captain America" — which would continue building the Marvel universe and finally integrate all of these characters, plus a re-casted Hulk from the 2008 "The Incredible Hulk," into what became "The Avengers" (Yockey, 2013; Weaver, 2014).

What was seen immediately following "The Avengers" was a new, interconnected universe where characters began dealing with repercussions of what happened from this specific film in their own storylines. With the success of its films, Marvel implemented the next phase of its transmedia strategy: the introduction of a television series — the first step towards becoming a true transmedia project.

"Marvel's Agents of S.H.I.E.L.D." became new content for the transmedia universe, while the basic television set became the platform. The characters within the show had dialogue discussing the events that took place in "The Avengers" as well as the various other movies within the MCU. This permitted audiences to engage with the MCU at a different level, taking them to a medium that would allow for the continuation of the characters, storylines, and world that they fell in love with on film, while also giving less involved fans a complete story experience by not missing out on anything by not indulging in the films

With the emergence of streaming technologies, Marvel has been given another platform in which to implement its strategy. Companies like Hulu and Netflix have begun creating series that bypass the traditional cable platform and instead showcase their media immediately on their websites. Information from the Harris Poll showed that traditional television viewing has decreased from 89 percent to 85 percent throughout 2014 (Kissell, 2014). During that same year, television viewing over the Internet grew by 388 percent, with unique viewership growing 146 percent (Wohlsen, 2014). With the interest in faster content and the popularity of streaming technologies, companies like Netflix and Hulu have started formatting their original content specifically for the platform on which they release it, creating a new wave of media.

Marvel, with its large fan base and billions of dollars at its disposal, has taken advantage of this newer technology by making some shorter series which are immediately distributed via the streaming site, Netflix. The decision to make a straight-to-streaming show places a Marvel story on nearly every platform that audiences would traditionally go to for such content; that is, Marvel now has a presence on film, television, and streaming sites (not to mention its traditional platform in the comic book world, a topic much too large to discuss here).

Given the transmedia nature of Marvel's current universe, the fact that such cohesive stories can exist across multiple platforms leaves one wondering just how engaged an audience member can become with the different stories. The question of whether or not the same world can translate across different media platforms, and whether or not an audience member will react in the same way to each story, is raised.

Looking into this transmedia world at a psychological and physiological level would yield more quantifiable results. This would also help researchers determine if the same story

universe can be experienced at similar engagement levels across such different platforms with vastly different audience demands, as well as time and monetary constraints.

Recent studies in both brainwave frequencies and electrodermal activity (as measured by galvanic skin response) have made it possible for physiologically based research to take place across multiple platforms of interest in communication. The different frequencies transmitted from peoples' brains as they partake in different activities have given researchers an advanced look and understanding at what is going on in these individuals' psyches (Azcarraga & Suarez, 2013; Heraz & Frasson, 2011), while physiological responses associated with film clips give researchers a more objective look at emotional stimulation. While exact readings of brainwaves do not, by any means, accurately predict an individual's emotional state while such individuals are participating in various activities (Teplan, 2002; Azcarraga & Suarez, 2013), galvanic skin response (GSR) does.

Brainwaves are generally measured through two separate types of technology — a functional magnetic resonance imaging (fMRI) device, or by an electroencephalography (EEG). For this study, an EEG will be used to measure the four different types of brainwave activity within participants as they view different portions of the Marvel Cinematic Universe.

Humans transmit four different frequencies, which represent separate mental states. There has been extensive research (Fu-Chien, Yun-Kai, Chih-Chia, & Chih-Hsun, 2014; Heraz & Frasson, 2011) done on the presence of different brainwaves during participant viewing of various film clips, corroborating the theory that brainwaves accurately display some form of engagement. The brainwaves that human beings transmit are categorized as delta, theta, alpha, or beta.

Delta waves are considered to be the lowest frequency of the human brain and generally mean an individual is in a deep sleep or experiencing hypnosis (Fu-Chien, Yun-Kai, Chih-Chia, & Chih-Hsun, 2014; Heraz & Frasson, 2011). It is during delta wave emission that the body's immune function is increased and both physical and mental restructuring occurs (Fu-Chien, Yun-Kai, Chih-Chia, & Chih-Hsun, 2014; Heraz & Frasson, 2011). Closely related to delta waves are theta, which occur during deep relaxation or a state of meditation. When theta waves are being transmitted, individuals have an increase in creativity (Heraz & Frasson, 2011), their gateway to learning and memory is opened (Heraz & Frasson, 2011), and they experience vivid imagery, intuition, and information beyond normal awareness (Heraz & Frasson, 2011).

Alpha waves take place during mental and muscular relaxation (Fu-Chien, Yun-Kai, Chih-Chia, & Chih-Hsun, 2014; Heraz & Frasson, 2011). When people are experiencing this type of brain activity, they are generally housing positive thoughts (Heraz & Frasson, 2011), have improved memory, assimilation, and a higher capacity for learning (Heraz & Frasson, 2011). They also experience an overall mental coordination, calmness, and a mind-body integration (Heraz & Frasson, 2011).

The final type of brainwave is beta, which consists of three separate subsections. Beta waves are the dominate frequency an individual's waking state of mind experiences (Fu-Chien, Yun-Kai, Chih-Chia, & Chih-Hsun, 2014; Heraz & Frasson, 2011). When beta waves are being transmitted from an individual, he or she is more alert, attentive, engaged, able to pass balanced judgment, make decisions, and focus on issues at a higher mental level (Heraz & Frasson, 2011). Low beta waves generally mean an individual is musing over something (Heraz & Frasson, 2011); regular beta waves represent high engagement (Heraz & Frasson, 2011); and high beta

waves represent high complex thought, the integration of new experiences, high anxiety, and excitement (Heraz & Frasson, 2011).

Because of the nature and goal of this particular study, the researcher is primarily interested in the interpretation of beta waves, with the understanding that when or if the other brainwave frequencies are transmitted, then the engagement level of participants is lacking, and will result in different conclusions than originally anticipated.

Given the ability of an EEG to measure beta waves, and given that the existence of beta waves of varying degrees mean different levels of engagement within an individual, it is a believable conclusion that EEG is as accurate of a device to capture how engaged an individual is with particular cinematic stories as can be readily available. Pairing EEG readings with GSR, though, will better capture an individual's full engagement levels and might fill in many of the gaps with the brainwaves.

Electrodermal activity refers to the alterations present in an individual's skin (or derma) as a result of psychologically-induced sweating (Greco, Lanata, Valenza, Scillingo, & Citi, 2014). It has been found that measuring an individual's galvanic skin response is an accurate way to monitor his or her autonomic nervous system (Greco, Lanata, Valenza, Scillingo, & Citi, 2014), where involuntary actions take place — such as a heart beating, digestion, and blinking.

Transportation theory, also known as narrative transportation theory, purports that when people lose themselves in a story, or become so engaged that they begin to withdraw their senses from the world around them, their attitudes and intentions change to reflect that story (Green, 2008; Van Laer, De Ruyter, Visconti, & Wetzels, 2014). It is the goal of many, if not most, storytellers to completely enrapture their audiences with their plot and characters, creating within them an excessive desire to continue reading, watching, or listening.

It can be reasonably assumed, per transportation theory, that when individuals begin immersing themselves into a story, their brainwaves will change to reflect this. The amalgamation of brainwave technology and transportation theory within the Marvel Cinematic Universe can help shine a light on just how effective the MCU is at engaging its audiences and taking the viewer from a casual relationship with Marvel, to a more intimately intense one.

It is the purpose of this study to determine if the level of engagement is reflected at a physiological level within individuals' brains, as well as their GSR, as they watch content from the Marvel Cinematic Universe originally broadcasted and intended for different platforms, including movies (MOV) for the cinematic screen, television shows (TV) for a television set, and streaming shows (SS) for web and mobile screens. This study aims to assess the differences in brainwave functioning and galvanic skin response, and the amount of engagement therein, that the separate distribution platforms of the MCU produces.

Literature Review

Transmedia

The key element to successful transmedia storytelling is that the tale is able to transcend one story world and enter into this new story as flawlessly and effectively as it did the first.

While transmedia itself is an old concept, transmedia storytelling is relatively new. Jenkins (2006) first published his thoughts on the transcendence of story across multiple platforms in the *Technology Review*. Here, Jenkins (2006) introduced transmedia storytelling to help describe the phenomenon occurring in "The Matrix." Before the release of the first movie, the producers asked audiences an unnerving question: What is the Matrix? In a prompt to figure out the answer to this question, droves of people turned to the web — which turned up a few results. As the movie progressed, it became more and more confusing to just casual fans. Those

really delving into the transmedia nature of it, though, found a sense of completion and understanding when combining web searches, a video game, all three movies, and a resulting Matrix mythology (Jenkins, 2006).

Jenkins (2006) described transmedia storytelling as a story which "unfolds across multiple media platforms, with each new text making a distinctive and valuable contribution to the whole." He further describes that in the ideal form, each separate medium tells its part of the story as completely as possible so that audiences can expand their knowledge through the other mediums (Jenkins, 2006).

The film and television industries, while previously focusing on just their own craft, rarely crossed over during the early years of the two media. One of the first adaptations of one medium into another can be seen with some of the long running series made into television movies, such as those in the Star Trek franchise. However, while the movies stood on their own, they rarely affected the story arch or the encyclopedia of the original, continuing story; they were merely adaptations of the original stories That is, what generally happened in a movie did not have any consequences on a corresponding television series with the same characters, oftentimes even portrayed by different actors and actresses.

Transmedia begs for participants to search for more information and to discover the story world in new and interesting ways, giving a holistic experience. Fans of an entertainment source, those considered to be more than just casual watchers or readers, desperately search for more information. They want "interactive, participatory, and communicative multi-platform engagement" (Graves, 2011) that meets their desire to fully engross themselves in this fictional world. Such transmedia oftentimes include the original content, such as a book or movie, and

then adds in subsequent material, such as webisodes, podcasts, television shows, computer games, etc., as time progresses.

Tenderich (2013) found that in marketing, the most successful campaigns are those of the transmedia nature which include narratives, participation from fans, and an identifiable brand. Narratives include the stories to which audiences relate — the struggle of a primary character attempting to overcome some obstacle or force in an attempt to reach his or her goal, which must also be something wo which audiences can relate (Evans, 2011). Participation, in marketing, generally refers to brand interaction — sharing the brand and spreading it to other possible consumers who might be interested (Tenderich, 2013). However, participation for transmedia storytelling, or transmedia entertainment, is both similar and different. Sharing the media is in essence a form of participation, but delving deeper into the mythos and exploring the world is ultimate interaction with the universe.

What makes transmedia storytelling successful is the "implicit promise to decentralize authorship and promote collaboration, both between creators in different mediums and creators and fans" (Scott, 2010). The creation of a fan world, including information that eventually becomes official canon, is essential in making a successful transmedia universe (Scott, 2010).

Interaction with a story, whether it be from a comic book, novel, television show, or movie, is much harder than engagement with a brand that is attempting to stay relevant in the everyday lives of its consumers. While companies allow for a free-flowing conversation and are able to answer questions about their products, a single movie franchise might find it more difficult. Participation, then, becomes something for which the fan is wholly responsible.

Transmedia gives an audience member the most successful and enjoyable experience when the member is considered a fan, or an expert viewer wishing to know more about the

mythology of a show (Bourdaa, 2013). One of the easiest ways for a 21st century fan to engage with a transmedia story he or she appreciates is to take to the Internet. Here, fans can interact with one another, discussing plot themes, theories, and even create "fanfiction," which expands the story world into amateur territory meant purely for enjoyment.

More die-hard fans can participate in a story by attending conventions or seminars related to the story worlds they enjoy. While the date and location of the very first fan convention has often been disputed, one of the largest conventions in the United States, with a daunting attendance of 130,000 in 2012, is Comic Con International, held each year in San Diego, California (MacDonald, 2013).

Various comic book illustrators, television show producers, movie directors, and all of the talent that helps to produce the content audiences love, attend this convention to engage with the fans and help promote their image. Here, fans are able to interact with each other, explore booths related to the content, meet some of the actors and actresses that appear in the show (and/or subsequent movie adaptations), and further immerse themselves into their favorite story worlds (MacDonald, 2013).

While the convention supplies the sought after interaction mega fans seek, many of the story franchises themselves are not transmedia in a storytelling sense. True, the story is told on different platforms. However, the interconnectivity of many of the stories stops at the end of each platform — never crossing over from the movie world to the television studio. While some studios are beginning to connect their stories across the different platforms, many have yet to realize the potential true transmedia storytelling brings.

Perhaps one of the best series to first implement a transmedia storytelling world, Doctor Who originally saw enough success from its cross-platform series that it initiated a reboot of the

once “cancelled” television show (Newbold, 2010). Out of necessity, Doctor Who transcended the media barrier and began integrating its once beloved television show into a series of radio dramas, books, and comics (Newbold, 2010). What happened to the titular character “the Doctor” in a book would translate to the radio drama, which would deal with the aftermath of the event or vice versa. As the show began to gain popularity from fans, the BBC made the decision to reboot the classic science fiction story with great success (Newbold, 2010). However, instead of starting from scratch and creating a whole new series, as many television and movie remakes do, the executive writers of the series decided to pick up where the books and radio show left off (Newbold, 2010) — a decision that proved to be successful and earning Doctor Who the honor of being the longest running science fiction television series (Guiness World Records, n.d.). While Doctor Who primarily followed the story of the Doctor, it oftentimes contained episodes or miniature dramas concerning ancillary characters or the Doctor’s home planet.

With great transmedia storytelling, the management of such complex themes, characters that might exist in one world exclusively but affect others in a different medium, and the ever changing landscape of the story world can get confusing. To help eliminate some of this confusion, many fans create exhaustive encyclopedias and wikis that contain all information related to a particular story.

In the creation of an encyclopedic universe of transmedia storytelling, Bourdaa (2013) found that transmedia storytelling serves the purpose of providing background and foreground stories on different media outside of the original platform on which the media was published or broadcasted. By including this additional information, producers are engaging their audience members in a more complete experience. This “insider information” is able to increase loyalty to the particular show.

For instance, the NBC show Constantine, based on DC Comics' Hellblazer series, sprinkled what are known as "Easter Eggs" throughout the short-lived first season. "Easter Eggs" are inside jokes or nods to the original comic book series, related stories, interesting characters or objects that repeatedly make an appearance, etc. (Van Luling, 2014). For Constantine, the Easter Eggs are the various apparatus and objects that have relevance to the comic's original storyline.

While the show was cancelled in the middle of its first season after waiting in a virtual limbo for several months, intense fan interaction initially sparked the social media campaign, "Save Constantine" (Moore, 2015). Fans of the television series took to Facebook and Twitter to express their desire to see the show renewed for a second season, or for it to complete its entire 23-episode first season (Moore, 2015). By using the hashtag "saveconstantine," fans tried reaching out to producers and rating specialists Nielsen to indicate that while viewership might not seem high on traditional media (the television set), the fan base far extends this platform (Bergen, 2015). Having only just begun rating streaming services, Nielsen is able to provide only a small glimpse of what a show's true following really is (Regan, 2014).

Fan interaction with shows far surpasses just wikis, encyclopedias, and trying to convince producers and networks to renew a television show, though. In an attempt to transcend the lackluster final three movies in the Star Wars franchise, fans took to creating an amateur collage and composing their own adaptation of the film — a truly interactive experience. The movie, Star Wars Uncut, was compiled using 473 fifteen-second clips that reenacted the movie Star Wars Episode IV: A New Hope (Voigts & Nicklas, 2013). The film eventually won the Creative Arts Emmy Award for Outstanding Achievement in Interactive Media in 2010 (Voigts & Nicklas, 2013).

While the Star Wars franchise has seen tremendous success in the film, comic, toy, TV animation, and fanfiction platforms, it has not yet transcended to the television set through live-action series in a successful manner. Deep space exploration, while no stranger to the small screen (see Doctor Who, Star Trek, Firefly), is sometimes difficult to realistically portray with the smaller budgets given to produce each episode of a television series. Superheroes, though, provide a fairytale-esque theme that audiences can relate with, and allow for both over the top and low budget production.

Having originated from comic books and transitioning to the various screens, comic book adaptations are in their very nature "transmedia material." However, a successful transmedia world does more than just transfer between one format to another — it enriches and affects the story world by pulling new fans into the universe through this new medium, and makes them die-hard fans, exposing them to the world and engaging them "in the hunt for further information in the comics and/or other media" (Ioannidou, 2013).

Jenkins' (2006) explanation of the transmedia nature of "The Matrix," while being a success, only shows how the film exists in its own story world. There is not an intermingling of characters who exist individually, able to enter this world and actually cause a series of effects which, when returning back to their original worlds, are further explained through this new lens. That is, a story world becomes a story universe when the transmedia extends both the medium and the plot line. Comic books have been able to provide this slightly altered definition.

As the success of more popular transmedia experiences rises, the culture around this phenomenon has shifted. Americans are demanding more from the stories they enjoy, and with their demands are possibilities of an increased revenue flow. The entertainment industry, as it is, is in transition (Loads, 2014).

Marvel's Transmedia Plan

What has probably been the most successful transmedia storytelling experience in recent years, Marvel, the comic book company, went beyond its original platform to the movies. Beginning in Phase 1, the Marvel Cinematic Universe (MCU) implemented seven movies related to various superheroes in the franchise. As Phase 1 came to an end, Marvel did something that no other movie company has been able to do before: it created a television series that immediately dealt with the aftermath of what happened at the end of the Phase 1 movie, "The Avengers."

While comic book fans have long loved the various stories artists have created, the adaptation of stories such as "Iron Man" and "Batman" have given the general population a chance at exposure to these tales via popular culture. The adaptation of the Batman series from DC comics has traditionally been a success (barring, perhaps, the 1993 animated "Batman: Mask of the Phantasm"). However, the movie and television rights of DC comics are not unified. Fox owns the rights to Batman (Rossen, 2014), while the CW has precedence over television rights to "The Flash" (Andreeva, 2013) — two DC "superheroes" whose stories have crossed in comic books before. The television show "Arrow," originating as a comic with DC, has paved the way for the more recent series "The Flash." While these two stories are able to intermingle and make small cameo appearances, the lasting effect of each character in the others' story universe stops there. That is to say, these television shows do not have any impact on the movies being released by DC, stopping the development of a cinematic universe.

One of the primary reasons for this rift in transmedia storytelling for this particular entertainment sector within DC is the copyright issues regarding which company is able to produce which show. Fox owns the rights to Batman, while the CW has television and film rights to Arrow. NBC has optioned Constantine, from the Hellblazer comic book series, but not the

others. These shows, while not all incredibly important to the story arches in their respective series, are able to crossover into the worlds of the others with lasting effects under the ownership of DC comics. All-in-all, DC has released five separate television shows on four separate networks. Out of these five shows, only two, “Arrow” and “The Flash,” tie directly into each other. None of the shows, however, exist in the same story world as the movies DC is also releasing. While a powerhouse at the movies and now in the television studios, DC has not yet been able to unify its separate series into one transmedia storytelling experience for fans and audiences to enjoy.

Marvel, however, is a company in unison. After the significant buyout of most Marvel movie and television rights by Disney Corporations, Marvel began its Phase 1 experiment of integrating the story arches of well-loved heroes. With the exception of Spiderman, which is owned by Sony Films — but was just recently released to Disney on a temporary basis — and X-Men, which is owned by 21st Century Fox, the majority of Marvel comics are licensed by the entertainment and media giant (Young, 2014). The comics, films, and now television series are beginning to interact in such complex ways that lead audiences hunting for more information in the other media they have yet to explore (Ioannidou, 2013).

Marvel’s transition into the household name it is now began in 1961 with the creation of the Fantastic Four (Yockey, 2013). As time progressed, the comic book company, with front man Stan Lee, began creating more complex superheroes such as Iron Man, Doctor Strange, and the X-Men. With the creation of these and similar characters, Marvel Comics constituted a revolutionary idea — that they all exist in the same story universe, allowing them to cross-over into each other’s arches (Yockey, 2013).

When Marvel first optioned its properties into the film industry, they immediately saw box office success (Box Office Mojo, n.d.a). Just as they created a cross-universe experience in print, the powers that be decided to do the same with the films, and later television series — creating a cross-universe, transmedia experience for fans (Yockey, 2013).

The Marvel Cinematic Universe (MCU) began with the film "Iron Man" in 2008. "Iron Man," played by Robert Downey, Jr., saw immediate success at the box office (Box Office Mojo, n.d.a), indicating something that the X-Men films showed producers — that superhero movies were incredibly profitable. Immediately following the release of "Iron Man," "The Incredible Hulk" was released and introduced a curious notion — that Robert Downey, Jr.'s Tony Stark/Iron Man appeared in character, intermingling the story words and breeding a new era.

The success of Marvel's Cinematic Universe can be seen by purely looking at box office numbers. "Iron Man," the first Marvel movie that created this transmedia storytelling universe, grossed over $318 billion. The film was a commercial, creative, and intriguing success. "The Incredible Hulk" proved to be a commercial "setback" compared to "Iron Man," grossing "only" $134 billion (Box Office Mojo, n.d.a). "Thor" was released next, grossing over $181 billion; then "Captain America: The First Avenger," grossing more than $176 billion (Box Office Mojo, n.d.b). As the credits rolled in each Marvel film, "Easter Eggs" were sprinkled throughout the movies and the after credit scenes gave audiences a glimpse at what would be happening next.

"The Avengers," the cumulative ending of the MCU's Phase 1 initiative, capped off by grossing over $623 billion at the box office (Box Office Mojo, n.d.c). Transmedia storytelling was a commercial success, and the MCU was preparing to enter Phase 2 of their plan: the release

of a series of sequels, or the third installment of a trilogy, in conjunction with new television shows exploring the lesser known angles of this superhero world.

"Agents of S.H.I.E.L.D." explores the immediate aftermath of the alien attack on New York City which happened at the end of the film, "The Avengers." While the casual observer would understand the story and pick up on the different plot lines, in order to fully enjoy this television drama, audiences would have needed to see "The Avengers." The storylines of various characters are affected by the actions of the primary movie superheroes.

Immediately following the release and success of "Marvel's Agents of S.H.I.E.L.D.," plans for releasing "Daredevil" on Netflix went underway, finally solidifying the MCU as the cinematic transmedia powerhouse. In addition to "Daredevil," Disney and Marvel have released (or plan to release) two additional streaming stories, "Jessica Jones" and "Luke Cage" (Animation Xpress, 2015).

Transportation theory

While the commercial success and fan response to the MCU is apparent, the actual reasons people become so enraptured in these stories in particular, or any story, has always been in question. Transportation theory purports that individuals become lost in a story, suspending their disbelief and changing their attitudes and intentions to properly reflect the world portrayed on screen or in print (Van Laer, De Ruyter, Viscontin, & Wetzels, 2014).

The theory was first mentioned by Richard Gerrig (1993) in his book, "Experiencing Narrative Worlds: On the Psychological Activities of Reading." Gerrig (1993) equated reading with traveling, believing that readers become detached from the physical world and enter into this new world as a result of the fixation on this story. At times, the reader, or traveler, becomes

so engrossed in the story that he or she begins to question reality and actually feel transported to this fictional world in a physiological aspect (Gerrig, 1993).

With transportation theory, “enjoyment can benefit from the experience of being immersed in a narrative world, as well as from the consequences of that immersion” (Green, Brock, & Kaufman, 2006), with the consequences being the adaptation of actions, attitudes, or beliefs of characters that would not otherwise be present in the viewer.

In a negative light, transportation theory suggests that people’s psyches are malleable, easily adapting to what they deem are “cool” or appropriate for further advancement in society. Green and Clark (2013) found that smoking in movies are responsible for influencing adolescents to use tobacco. A basic understanding of this theory could be understood with Green and Clark’s (2013) logic. That is, a child or easily manipulated individual watches a likeable character behave in a certain manner, the likeable character accomplishes his or her goals or exhibits a desirable trait to the viewer, then the viewer adopts that behavior or attitude, at least temporarily, to also achieve the desired trait, goal, or circumstance.

Should the transportation of the viewer’s attitudes lead to a semi-permanent change, then it can be reasonably assumed that the viewer would seek out similar experiences, either in real life or entertainment media, which would satisfy and reinforce their new behaviors (Eastin, 2013).

Green and Brock (2000) found that those individuals experiencing a higher level of transportation into a narrative world are more easily influenced by the beliefs, ideas, and customs conveyed throughout the story across a wider range of topics than those who experience less transportation into the narrative world. Just as some people are more easily hypnotized or take to

a sport faster than others, individual differences exist in the levels of transportation people experience (Eastin, 2013).

The link between violence and media has long been a sensitive one. Scholars of transportation theory purport that those individuals who are more susceptible to this phenomenon are more likely to change their beliefs regarding violence based on the portrayal of it in popular films, movies, books, or other entertainment media (Eastin, 2013). The viewer, for example, watching “Fight Club” might begin to associate the use of violence positively, “which may in turn lead to more violent behavior” (Eastin, 2013).

Brainwave technology and entertainment media

Since its invention in 1929 by Hans Berger, troves of research have been performed using the electroencephalogram (EEG) (Cichocki & Sanei, 2007). The accuracy and functional usage of the EEG has been addressed in various journals, textbooks, and scholarly articles. Previous studies suggest that an EEG can be useful in predicting certain “academic emotions, such as confidence, excitement, frustration and interest” (Azcarraga & Suarez, 2013), while others ascertain that both “positive” and “negative” emotions have been recognized using EEG processing (Frantzidis et al., 2010).

Brainwaves exist in four separate frequencies as measured by Hertz (Hz). The higher the Hz frequency, the higher the state of arousal (Chanel, Kronegg, Grandjean, & Pun, 2006; Dmochowski, Sajda, Dias, & Parra, 2012). As seen in Table 1, beta waves have the highest frequency and can therefore be assumed to indicate the highest level of arousal in individuals when present. Beta waves are classified in three separate categories, including lower beta, beta/middle beta, and hi/higher beta waves. Lower beta waves are considered to be a transition between alpha and beta waves, representing a relaxed but slightly attentive state (Edmonton

Neurotherapy, n.d.; Heraz & Frasson, 2011). Regular beta waves, or middle beta waves, denote an engaged and active state of mind, while higher beta waves indicate excited, hypervigilant, or an emergency state of mind (Edmonton Neurotherapy, n.d.; Heraz & Frasson, 2011).

Despite the positively significant research associated with using an EEG device, there are several instances that could lead to polluted and unusable data as a result of the apparatus malfunctioning, picking up incorrect neural activity, or simply dislodging itself from the participants. Care must be given in recording and reading EEG data to determine whether or not the waves recorded were from the brain or muscle movements near the eyes, scalp, and forehead that might interfere with the EEG recordings. The predictability of neural processing is inherent in the actual results of any research using brainwave technology. If the machinery malfunctions or does not read what it is intended to read, then the results become incomprehensible and must be scrapped.

Table 1

Brainwave frequency pairings

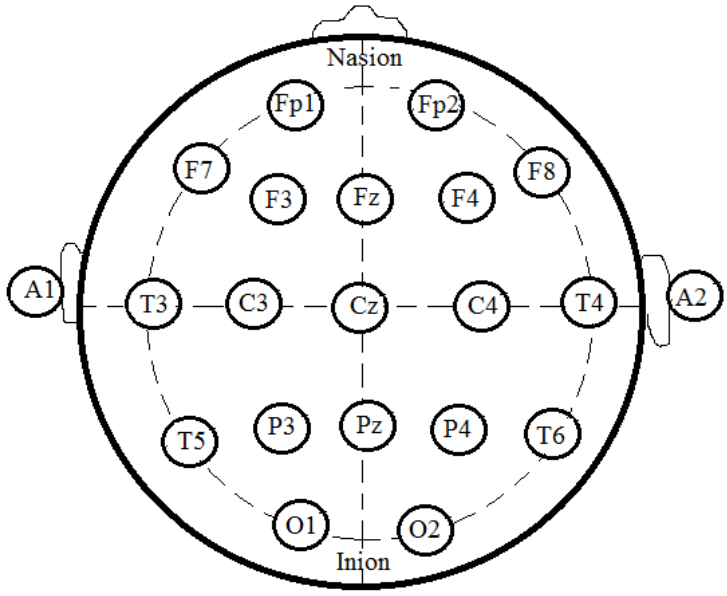
Wave	**Frequency**
Delta	0-4 Hz
Theta	4-8 Hz
Alpha	8-12 Hz
Beta	> 12 Hz

The placement of the EEG electrodes on the scalp of participants is vital in collecting accurate and valid readings. The most common placement of electrodes is known as the 10-20 system, or the international 10-20 system (Teplan, 2002). Electrode placement is associated with

the corresponding cerebral cortex under each area of the skull (Teplan, 2002). Figure 1 below shows the placement of each electrode for EEG testing in the 10-20 system.

While the most common electrode placement is the 10-20 International System, many neurologists chose to use a single positive electrode placement on the Ocipital Lobe (Pz) or the midline (Cz) (Creel, 2015). When using only one primary electrode, a negative location on one earlobe must be utilized, with the other earlobe serving as a grounding location. This system of placement has been found to be a good initial screening for most EEG readings (Creel, 2015).

The marrying of physiological or psychological research with entertainment media can best be seen in research performed concerning different stories and brainwave technology. While scientists cannot actually read a person's mind, they can come close by recording an individual's brainwaves — to understand people at an even deeper level than they themselves do.



Key	
Electrode	**Lobe**
F	Frontal
T	Temporal
C*	Central*
P	Parietal
O	Occipital

*A central lobe does not exist, the "C" is used for identification only. Even numbers refer to electrodes placed on the right hemisphere. Odd numbers refer to electrodes placed on the left hemisphere. The "Z" refers to the electrodes placed on the midline.

Figure 1. Electrode placement for EEG measurements on a human scalp.

(Note: The inion is the projecting part of the occipital bone at the base of the skull, indicating the "back," or posterior portion of the head. The nasion is the middle point of the nasofrontal structure, indicating the "front," or anterior position of the head.)

The level of engagement an individual experiences when partaking in a task differs depending on the specific job. When compared to reading a novel, individuals watching a movie are more likely to have higher alpha brainwaves than when reading, suggesting that the individuals are in an awake, but more relaxed, state when casually watching than actively reading (Kao, Lin, & Chen, 2014).

Similarly, beta brainwaves are higher in individuals reading a book than those same individuals watching a movie, suggesting that more engagement and active participation is occurring (Kao, Lin, & Chen, 2014). Researchers in Taiwan suggested that this finding was because individuals who are reading need to actively engage with the medium, interpreting the message, thinking of plot devices, and expelling energy to decipher the meaning of the book (Kao, Lin, & Chen, 2014). The act of watching a movie, however, has long been considered passive — meaning individuals are given the media on a screen and only need to keep up with the plotline, characters, and language being used (Miller, 1985). The researchers suggested that different types of movies, for instance, horror versus romance, require different levels of engagement and would alter brainwave states depending on the genre, leaving room for future research on this subject (Kao, Lin, & Chen, 2014).

While numerous data have been collected using technologies that measure or follow galvanic skin response, eye-tracking, heart rate, and perspiration, very little exists in the linking of emotional responses with EEG technology in film studies. However, some research has been found linking film genre and different brainwave patterns. For instance, theta waves have been

found to be more prevalent and in greater synchronization with other corticol regions of the brain in individuals viewing aggressive film content than when viewing sad or neutral content (Krause, Viemerö, Rosenqvist, Sillanmäki, & Åström, 2000). This suggests that more action oriented film content containing fight scenes might "awaken" an individual to a state of higher engagement and arousal.

Despite the lack of scientific research using EEG technology specifically attempting to look at the emotional responses in film genres (and not those using film clips to elicit emotional responses using EEG apparatus), there exist several studies which have measured the level of engagement individuals have with narratives, film, and genres using brainwave technology. Film clips containing more emotional involvement have been found to be more engaging, as evidenced by the decrease of delta, theta, and alpha activity (Dmochowski, Sajda, Dias, & Parra, 2012). Film clips that hold viewers' attention longer have also been found to have a higher level of engagement, also as evidenced by the lower levels of alpha brainwave activity (Dmochowski, Sajda, Dias, & Parra, 2012). An increased level of theta activity in frontal areas of the brain has also been found when participants view emotionally arousing content, which indicates a higher likelihood of memory encoding (Dmochowski, Sajda, Dias, & Parra, 2012).

The link between preference and popular television programming has also been found using EEG technology. In a 2014 study by Dmochowski, Bezdek, Abelson, Johnson, Schumacher, and Parra, the researchers found that the "expressions of interest and preference among thousands" was accurately predicted by an EEG. When viewed by individuals who have never seen AMC's "The Walking Dead," neural components echoed the Nielsen ratings and general popularity of the drama (Dmochowski, Bezdek, Abelson, Johnson, Schumacher, & Parra, 2014). That is, an individual's EEG readings positively correlated with the mass perception of

the show — both the popularity of the drama and the brainwaves of those just being introduced to the show suggested enjoyment of some sort.

In the last decade, a few firms and movie studios have begun using fMRI, EEG, galvanic skin response, eye-tracking, and other biometric technology to help predict audience perception to blockbuster hits (Randall, 2011). The creation of "neurocinema," using "neurofeedback to help moviemakers vet and refine film elements such as scripts, characters, plots, scenes, and effects" (Randall, 2011), has recently taken off. Companies like MindSign and NeuroFocus have begun using EEG technology to measure audience responses to movie trailers and different sequences from particular films (Randall, 2011). While most neurocinema companies keep their clientele list under lock and key, the award winning film Avatar is known to have benefitted from using neurocinema trailer testing, including the use of EEG brainwave scans (Randall, 2011).

The reliability of EEG technology has been in question regarding the actual predictability of neural pathways in individuals (Chanel, Kronegg, Grandjean, & Pun, 2006). However, the possibility of using EEG's to measure emotion has been confirmed by previous findings of researchers, most suggesting the pairing of survey measurements, peripheral signal apparatus, or physiological testing technologies to help verify and support EEG findings (Chanel, Kronegg, Grandjean, & Pun, 2006).

Many other researchers have found a strong link between brainwave technology and the level of engagement individuals express when partaking in entertainment media (Dmochowski, Sajda, Dias, & Parra, 2012). One of the easiest ways to measure engagement when using an EEG is to look for beta waves over a period of time. Beta waves, when emitted during active viewership sessions, have been linked with a higher level of enjoyment (Dmochowski, Sajda,

Dias, & Parra, 2012; Heraz & Frasson, 2011). Researchers believe this is the result of the viewer's engagement rising, as indicated by the presence of beta waves.

Previous research has found that the larger the audience, the more accurate results EEG readers produce (Dmochowski, Bezdek, Abelson, Johnson, Schumacher, & Parra, 2014). Surprisingly, the reliability of fast neural processing has been found to be a genuine predictor of preference in larger populations as well (Dmochowski, Bezdek, Abelson, Johnson, Schumacher, & Parra, 2014).

There exists a large gap in research containing information on the effectiveness of cinematic transmedia using scientific devices. Measuring engagement levels across Marvel's Cinematic Universe by using both EEG technology and transportation theory would highly benefit the academic world by providing invaluable insights into what it is about Marvel's transmedia universe that is so effective, and whether or not the cohesiveness of the stories in the MCU exist across multiple platforms.

Galvanic Skin Response and Film

The first implications of electrodermal activity are generally accredited to Romain Vigouroux in 1879. However, experiments using and corroborating his work were not completed until 25 years later, by Veraguth and Jung's word association studies (Neumann & Blanton, 1970). Since then, electrodermal activity, or galvanic skin response, has been used in all forms of research from film studies (Codispoti, Surcinelli, & Baldaro, 2008; Kreibig, Wilhelp, Roth, & Gross, 2007) to psychopathic adolescents (Fung et al., 2005).

Electrodermal activity, commonly referred to as galvanic skin response (GSR), is the "variation of the electrical properties of the skin in response to sweat secretion" (Benedek & Kaernback, 2010), measured by a non-invasive technique of placing small electrodes on

participants' skin. When internal or external stimuli affect people, their "fight-or-flight" response kicks in, wherein the body prepares itself to deal with the emotional or physical stimulation resulting in the cooling technique of sweating (Psychlab, n.d.). As an individual sweats, he or she becomes more of a conductor for electricity, which modern GSR machines are able to measure. Currently, only the hand and foot are known areas of the human body able to effectively retrieve electrodermal signals related to thoughts and emotion (Psychlab, n.d.).

Vecchiato et al. (2009) used GSR, EEG, and heart rate measurements to note the different brain activity present in individuals viewing television commercials. While there were not any reported statistical differences between GSR values, through the holistic approach of also measuring EEG and heart rate, the researchers were able to conclude that the participants judged the commercials they viewed to be pleasant (Vecchiato et al., 2009).

Using GSR, Codispoti, Surcinelli, and Baldaro (2008) looked at emotional movies and the affective reactions based on gender differences of participants. The researchers used heart rate and facial reactions to increase the validity of their study. The researchers were able to support their theory that both men and women had a higher skin conductance when viewing both pleasant and unpleasant films in comparison to neutral films (Codispoti, Surcinelli, & Baldaro, 2008). Additionally, the researchers found that compared to men, women rated both types of films as less pleasant and rated the unpleasant film as more arousing, which was supported by their GSR (Codispoti, Survinelli, & Baldaro, 2008).

In an extensive research study looking at the differences between fear- and sadness-inducing films, Kreibig, Wilhelm, Roth, and Gross (2007) used GSR, cardiovascular, and respiratory response patterns of individuals to support their theory that these types of films produce different responses. The researchers found that there were "robust differential

physiological response patterns for fear, sadness, and neutral" films as measured by these different response patterns (Kreibig, Wilhelm, Roth, & Gross, 2007). Fear-eliciting films produced increased skin conductance levels and skin conductance responses (Kreibig, Wilhelm, Roth, & Gross, 2007). Additionally, the researchers found that there were increased levels of skin conductance responses to sad films compared to both the neutral film they showed and the fear-inducing one (Kreibig, Wilhelm, Roth, & Gross, 2007).

While GSR has been used to measure various types of differences between film genres, it has yet to be used to measure engagement levels in transmedia. Additionally, the majority of the literature seems to indicate that using galvanic skin response alone to measure physiological responses is not as reliable as using a holistic approach by pairing it with EEG measurements.

Methodology

Participants

Participants for this particular study were recruited through an email survey sent to the researcher's contacts, as well as through an automated messaging service that contacted psychology students at a southeastern university required to complete certain surveys, research, or activities for graduation, during the academic year of 2015-2016. A total of 267 participants (Group Alpha) began the 66 question survey regarding their feelings and perception on the cohesiveness of moving media in the Marvel Cinematic Universe (MCU), but only 43 were eligible to complete the entire questionnaire having seen at least one media from each of the three categories being looked at in this study. An additional six participants (Group Beta) were fitted with an electroencephalogram (EEG) and skin conductance device which recorded their brainwaves, galvanic skin response, and temperature while watching content from the MCU, but one participant's data had to be discounted in the results due to a software malfunction with the

recording device which erased the majority of the results. Participants in this group were also asked to complete a pre survey and the same, slightly altered, survey as those participants in Group Alpha. Only those participants in close proximity to the researcher were able to complete the EEG and GSR measures, as the equipment was located at a southeastern university in Central Virginia.

A screening question was asked of participants to eliminate any person under the age of 18 from partaking in the study. Additional screening questions were asked of those participants only answering the questionnaire and not receiving an EEG and GSR (Appendix A, questions 1-3). Only those individuals who had seen all three categories of the MCU described (film, television show, and streaming show) were included in this portion of the study. Those individuals participating in both the EEG/GSR measures and the survey were asked the same screening questions as those only taking the survey, but were not excluded from the survey as a result of their answers.

Participants in Group Alpha included those aged 18-35 with the majority of participants ranging from 18-22. A total of 23 females completed the survey portion of the study, while only 19 males took it. For the survey portion, the majority of the participants were from the southeastern portion of the United States (including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North and South Carolina, Tennessee, Virginia, and West Virginia) (n=26), with 16 participants being from other locations around the United States and international locations (Figure 2).

For the EEG/GSR measures, Group Beta participants were aged 18-27 and were primarily male (n=3), with one less female (n=2) completing the scan. The majority of

participants were (White/Caucasian) (n=3), with the following races also being represented: Black/African-American (n=1) and Asian (n=1).

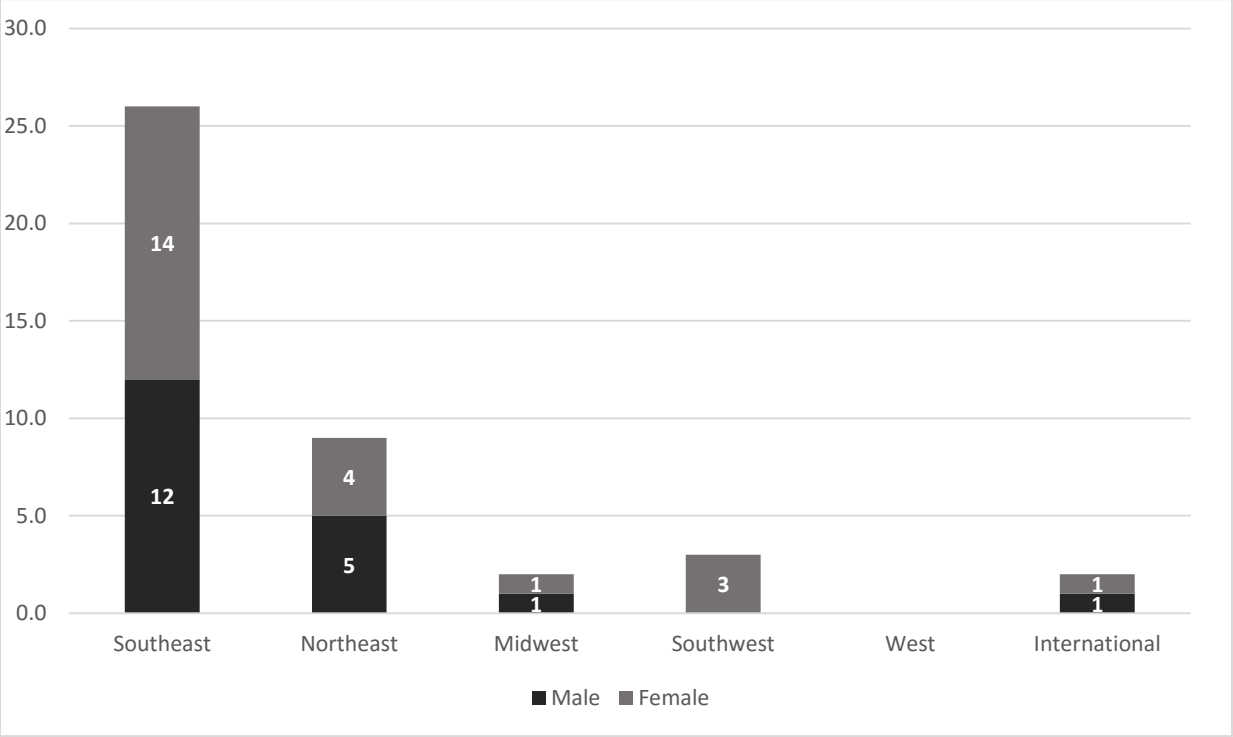


Figure 2. Age and geographic location of participants in Group Alpha.

Instruments

Alpha survey & Beta post-survey. A 66 question survey (Appendix A) was developed by the researcher to assess participants' perception of the Marvel Cinematic Universe's cohesiveness and transmedia abilities through the different platforms for which it was originally attended. This survey was a self-report inventory including questions on perception of media, familiarity with content, access to media, cohesiveness of story in the MCU, enjoyment of the media, and general feelings regarding the content.

Survey items were grouped together to create scales based on engagement (ENG) with Marvel media and basic positive perceptions (PERC) of Marvel media. Participants' self-reported engagement rating of each category of Marvel media (MOV, TV, SS) were used in

correlation with the questions *"Which of the following media types do you enjoy the most?"* and *"Which type from the following three categories keeps your interest for the longest amount of time?"* to help determine engagement levels with the media.

An altered version of this survey (eliminating the MCU screening questions and reducing the total amount of questions down to 63) (Appendix B) was given to participants in

Because of time constraints, validity was not measured for this particular survey and should be further assessed in the future.

Beta pre survey. A pre survey (Appendix C) was given to those individuals participating in both the questionnaire and EEG/GSR portions of this study. The pre survey consisted of 25 questions and asked individuals what their perceived feelings towards the media were before watching the content. Questions asked included the participants' film and genre preferences, knowledge of the Marvel Cinematic Universe, and what type of media on which they generally viewed their content. This was done in order to better gauge where the participants were coming from. The same reliability statistic methods were completed on this survey as the previous.

EEG/GSR device. The NeXus-10 MKII was used to measure EEG and GSR of participants. The NeXus-10 is a state-of-the-art neuroimaging machine that allows up to ten channels of EEG to be measured while also recording skin conductance, heart rate, and various other physiological responses of participants. Having ten channels available for biofeedback, the NeXus-10 is able to simultaneously look at both electrophysiological responses (such as EEG) and peripheral ones (GSR) in order to reveal a clear picture of whether or not participants are engaging with particular stimuli.

BioTrace+. The Mind Media software BioTrace+ was used to record the neurological and physiological responses used for this study. BioTrace+ allows compatible systems to record

biofeedback, neurofeedback, and physiological monitoring by using either pre-built or custom screens (Mind Media, n.d.). The software can record the following types of signals: EEG, z-score, SCP, EOG, EMG, ECG, skin conductance (GSR), temperature, blood volume pulse, respiration, oxygen levels, HRV, HEG, and multimodal (more than one type of signal at a time). A specialized screen (Appendix D) was created for this study in order to gather all of the feedback necessary for analysis.

Method for Choosing Media Content

Movies. The MCU movie "The Avengers" was chosen as the primary movie content to show EEG participants. The first five minutes, a selected ten minutes in the middle — determined to be a climatic build up by the researcher — and the last five minutes were shown on a laptop device to the participants while an EEG recorded their brainwaves on a separate laptop in the same room. Each participant only viewed 20 minutes from one movie. Selection of this movie was determined by the researcher because of its Phase 1 categorization within the MCU's transmedia initiative. The movies "Thor," "Captain America: The First Avenger," "Iron Man," and "The Incredible Hulk" were also considered because of their relation to the Marvel Transmedia Universe and involvement with Phase 1, but were discarded because of time constraints. "The Avengers" was considered to be the best option for the movie preference because of its storyline containing all of the primary superheroes of the Phase 1 MCU.

Television. The MCU television show "Agents of S.H.I.E.L.D." and was chosen by the researcher because of its direct relationship with the movies mentioned above, and because it was one of the only two MCU content available at the time of this study. The first, middle, and last five minutes of the show was played for participants. The pilot episode of this show was selected as a convenience sample. The short television show, "Agent Carter" was briefly

considered as an option for additional viewing, but was discarded because of time constraints and because of its limited release.

Straight to streaming. The Netflix show "Daredevil" was shown to all participants. Only the pilot episode was shown to participants. The first, middle, and last five minutes of "Daredevil" was shown to each viewer. The show "Jessica Jones" was released right before the research portion of this study began, and was eliminated as a possible viewing option for participants because of the limited amount of time it had been released and because of time constraints with this study.

Show selection and order criteria. The order of which media would be showed in which order was determined by making sure each media type was paired with the each of the others, and showed in each position (first, second, or third), resulting in a total combination of 6 possible viewing scenarios (Table 2). Participants were randomly placed in one of these 6 categories, with the first option being scrubbed due to the data not fully downloading to the recording device and then the software being deleted from the computer.

Table 2

MCU viewing scenarios

First	Second	Third
The Avengers	Agents of S.H.I.E.L.D.	Daredevil
Agents of S.H.I.E.L.D.	The Avengers	Daredevil
Daredevil	The Avengers	Agents of S.H.I.E.L.D.
Daredevil	Agents of S.H.I.E.L.D.	The Avengers
The Avengers	Daredevil	Agents of S.H.I.E.L.D.
Agents of S.H.I.E.L.D.	Daredevil	The Avengers

Procedure

Participants partaking in only the survey portion of this study (Group Alpha) were given access to an online link that lead them to the questionnaire to be taken on Qualtrics, a survey programming site. A total of 267 participants began the survey, with the majority of these individuals being screened out because they had not seen something from each category of the MCU (movie, television show, and streaming show). This reduced the participants down to a total of 42 unique respondents answering questions pertaining to their perceptions of the MCU, transmedia, and the method in which it was distributed (Appendix A). Those participating in both the survey and the EEG/GSR group (Group Beta) were asked to complete this same survey only after taking the pre survey and viewing all three segmented clips from the MCU.

Electrodes from the NeXus-10 were fitted to 6 participants (Group Beta) attempting to measure brainwave, galvanic skin response activity, and temperature while they viewed content from the Marvel Cinematic Universe. However, because the computer being used to record the numbers for the EEG/GSR group was a loaner computer, one participants' session was erased before anything other than raw plot points were downloaded, leaving the data unusable for the scope of this particular study (though still usable for other studies), and reducing the total amount of participants down to 5. Before being scanned, these individuals took a pre survey (Appendix C) attempting to measure their current level of knowledge, perception, and preferences for the MCU. As they viewed the content, their brainwaves, galvanic skin responses, and temperatures were recorded by a separate laptop device. Immediately after the third installment finished, each participant was asked to answer the same survey questions as those in Group Alpha.

Disposable, pre-gelled monitoring electrodes were placed on the ends of biofeedback wires and then placed on the participants' palms and thenars (the meaty portion of the hand at the base of the thumb) in order to record GSR.

Before beginning data analysis for the current study, an exploratory analysis was performed in order to better perceive the individuals being assessed. A screening analysis was executed to eliminate those individuals in Group Alpha who had not seen at least one movie, television show, and straight to streaming show from the Marvel Cinematic Universe. A total of 225 individuals were eliminated because of this criteria, reducing the total population of participants down to 42.

Group Alpha participants were categorized based off of their responses to the questions "I have seen the following Marvel film(s)," "I have seen the following Marvel television show(s)," and "I have seen the following streaming show(s)." These participants were then further categorized into two groups based on: which Marvel content they deemed to keep their interest the longest, either Marvel movies (n=29), Marvel television shows (n=6), or Marvel streaming series (n=7); and which Marvel content they deemed the most enjoyable, either Marvel movies (n=35), Marvel television shows (n=3), or Marvel streaming series (n=4).

Because of the small amount of participants for Group Beta, each person populated only one category based on broadcast order, with the grouping of "The Avengers," "Marvel's Agents of S.H.I.E.L.D.," and "Daredevil" being eliminated. Perceptions of their self-reported aptitude towards Marvel were compared against their EEG readings to get a better picture of what was happening within these individuals to either cause them to engage or disengage with the content being shown.

The average EEG readings of each participant were taken for the beginning, middle, and end of each media viewed, and then an overall mean was computed for each media to result in an overall engagement brainwave level. These means were then analytically compared against each other to help the researcher determine overall levels of engagement for various media types, and for each participant in particular. While beta waves were the primary interest of the researcher, alpha waves that were recorded were taken into consideration.

While GSR has been found to be linked in various ways to film and response rates, many scholars purport that because of the variability of skin conductance, it is not the most accurate measure of engagement. However, GSR was used in this study merely as a pairing response to either strengthen or weaken the EEG findings of each participant, and can be used as one possible example of whether or not GSR is a good indicator of engagement. Because of the variability of GSR, and because of the way the data is exported from BioTrace+ software, only three participants' overall GSR were analyzed for this present study. To do this, a line graph was interpreted by the researcher.

A one-way Analysis of Variance (ANOVA) was performed on the data from Group Alpha to determine perception, engagement, and preference of Marvel content for participants. The average Hertz level of participants during each segment of viewing was taken to determine overall engagement with each data type. Because participation numbers were so small and there was only one participant per group, further statistical analysis was not done on this group, and instead, a mixed-methods approach was applied with a qualitative case study view of the data.

Research Questions

The research questions and hypotheses for this particular study are as follows:

Research Question 1 (RQ1): What level of beta waves will be most prevalent in all three media types of the Marvel Cinematic Universe?

Research Question 2 (RQ2): Which original media platform content (movie, television, streaming) will cause the most engagement in viewers as indicated by beta brainwaves and GSR?

Research Question 3 (RQ3): Are brainwave patterns of engagement (as indicated by beta waves) and GSR consistent throughout each participant's viewing session?

Research Question 4 (RQ4): Are participants who have already seen all Marvel content types more or less engaged with the media (as indicated by brainwaves)?

Research Question 5 (RQ5): Do engagement and perception levels of Alpha participants vary depending on what type of Marvel content they reported enjoying the most, and what Marvel content they reported kept their interest the longest?

Hypothesis 1 (H1): Participants will be more engaged with the streaming show(s) than any other media.

Hypothesis 2 (H2): The Marvel television shows and streaming shows will engage the participants sooner than the movie.

Results

Group Alpha

The two scales (perception and enjoyment of Marvel media) used to run cross analysis across other variables were tested using reliability measures determined by calculating the coefficient alpha measure of internal consistency (Cronbach's alpha). The enjoyment scale consisted of 8 items and had a coefficient alpha of α=.77, considered to be reliably acceptable. The perception scale consisted of 7 items and had a coefficient alpha of α=.81, or a "good"

reliability score. Because both scales were considered to be at least acceptable, they were kept and used for further analysis to this study.

The questions *"Which of the following media types do you enjoy the most?"* and *"Which type from the following three categories keeps your interest for the longest amount of time,"* self-reported engagement ratings (1-10) of each Marvel media type (MOV, TV, SS), and self-reported engagement (ENG) and perception (PERC) scores were used to categorize participants and answer RQ5 and H1 of this study.

A frequency was ran on the questions *"Which of the following media types do you enjoy the most?"* and *"Which type from the following three categories keeps your interest for the longest amount of time?"* to help answer H1. As seen in Table 3, Marvel movies (MOV) were both enjoyed the most and kept the interest of participants for the longest, with streaming shows (SS) the next popular on both test variables, and television shows (TV) the least preferred. Results between enjoyment were significantly different between MOV and TV ($p < .001$) and MOV and SS ($p < .001$), but not between TV and SS ($p = 0.697$). Results between interest levels were significantly different between MOV and TV ($p < .001$) and MOV and SS ($p < .001$), but not between TV and SS ($p = 0.764$). These findings allow the researcher to partially accept the null of H1.

Table 3. *Frequency and percentage of participants whose interest was kept the longest in and who enjoyed Movies, TV shows, and streaming shows.*

Variable	Enjoy	Percentage	Interest	Percentage
MOV	35	83.3	29	69.0
TV	3	7.1	6	14.3
SS	4	9.5	7	16.7

Research question five asked: Do engagement and perception levels of Alpha participants vary depending on what type of Marvel content they reported enjoying the most, and what Marvel content they reported kept their interest the longest? Four one-way ANOVAs were computed in order to help answer this question.

Combined perception scores and engagement scores were measured against which content participants found to be the most interesting. Type of Marvel content participants indicated were the most interesting was found to have a significant impact on perception scores of the MCU, $F(2, 39) = 3.324$, $p = .046$. Fisher's post hoc results indicated that those participants who selected "Marvel movies" as the media that kept their interest the longest and those who selected "Marvel television shows" as keeping their interest the longest significantly differed in overall scores of perception of the MCU, $p = .014$.

What participants enjoyed the most had a significant impact on self-reported ratings of engagement (1-10 with 10 being enjoy the most) of streaming shows, $F(2, 39) = 4.014$, $p = .026$. A post hoc analysis revealed that those participants who said they enjoyed Marvel SS and those who selected that they enjoyed Marvel movies the most significantly differed in engagement ratings of Marvel SS ($p = .008$).

Ratings of engagement with Marvel TV shows were significantly impacted by what Marvel media participants said kept their interest the longest, $F(2, 39) = 5.118$, $p = .011$. As seen in Table 4, a post hoc analysis revealed that those participants who said MOV kept their interest the longest and those who said TV did significantly differed in engagement ratings of Marvel TV shows ($p = .010$), and that those participants who said MOV kept their interest the longest and those that said SS did significantly differed in ratings of Marvel TV shows ($p = .038$).

There were no significant differences between levels of engagement or perception with those who said they enjoyed a particular type of Marvel media more than any other.

Table 4. *Post hoc results of types of media participants found to keep their interest the longest and ratings of engagement for Marvel television shows.*

				95% Confidence Interval	
Marvel MOV		Std. Error	Sig.	LB	UB
	Marvel TV	1.238	.010	-5.88	-.87
	Marvel SS	1.162	.038	-4.84	-.14

Group Beta

EEG. For the majority of participants, brainwaves were consistently steady across all media, with varying levels of beta activity depending on the content being viewed. Interestingly, a few participants ducked down to alpha brainwaves while watching some of the content, with "The Avengers" being the only consistent media type to keep every participant transmitting beta

waves. Table 5 shows a comprehensive listing of the average brainwaves of each participant throughout the beginning, middle, and end of the media, and then a compilation of the average brainwaves per media type with a classification system in place for easy understanding.

Table 5. *Average brainwave frequencies of participants per media type*.

	Brainwaves per Media Type (in Hz)			Average BW per Media Type			
Participant	MOV (Beg, Mid., End)	TV (Beg, Mid., End)	SS (Beg, Mid., End)	MOV	TV	SS	Order of Media Viewed
Tango	23, 24, 29	22, 27, 25	21, 22, 23	25	25	22	SS, MOV, TV
Whiskey	17, 25, 25	13, 10, 11	13, 10, 11	22	11	11	TV, SS, MOV
Yankee	20, 22, 19	30, 30, 22	26, 24, 24	20	27	25	SS, TV, MOV
Kilo	18, 18, 20	20, 23, 19	18, 18, 20	19	21	19	TV, MOV, SS
Foxtrot	12, 12, 11	12, 11, 11	12, 12, 11	12	11	11	MOV, SS, TV
Average				21	19	18	

Research question one asked what level of beta waves would be most prevalent in all three media types of the MCU. For “Daredevil,” beta waves (19 Hz and 21.7 Hz) and alpha waves (11 Hz and 11 Hz) occurred the most frequently. For participant “Whiskey,” average brainwaves dropped to 9.6 Hz during the middle of the content, indicating a resting state of mind and nearly dropping down, on some occasions during the viewing, to theta levels — common in deep meditative and sleep states. The average brainwaves of each participant for “Daredevil” was 18 Hz, or regular beta levels.

For “Marvel’s Agents of S.H.I.E.L.D.,” the most frequent brainwaves were alpha (11 Hz and 11 Hz) and high beta (25 Hz and 27 Hz). Overall, average brainwave activity for this media

type was 19 Hz, indicating normal beta waves, but slightly higher ones than the previous media type discussed.

"The Avengers" yielded the highest levels of brainwave activity with both regular beta (21 Hz and 20 Hz) and high beta waves (25 Hz and 22 Hz) being the most prevalent throughout the showing. The average beta waves of all participants pooled nearly reached high beta levels, but ended up remaining regular beta waves with 21 Hz. "The Avengers" was the only media to not have any participant dip down to alpha brainwaves during the entire average viewing. However, participant "Foxtrot" did dip down to alpha waves during the final segment of this media type with brainwaves of 11 Hz.

The Marvel movie platform appeared to cause the most engagement in viewers (RQ2) as indicated by beta waves. As previously discussed, this was the only media type where the average brainwaves of each participant stayed between 12 and 38 Hz.

Brainwaves are fairly consistent across all segments of all media types for the majority of participants (RQ 3). All participants had at least two levels of the same brainwave for at least two different media at a given time. That is, participant "Tango" had high beta waves while viewing "The Avengers" and "Marvel's Agents of S.H.I.E.L.D.," and then regular beta waves while viewing "Daredevil" (Table 5). Furthermore, all but one participant had brainwave levels that did not jump from one extreme to the next, the exception being participant "Whiskey," who had alpha waves for both "Marvel's Agents of S.H.I.E.L.D." and "Daredevil," but then jumped to high beta waves for "The Avengers," which was the last content viewed for this particular participant. "Echo" stayed consistent throughout each media type by transmitting regular beta waves for all three segments. Additionally, this particular participant only changed levels of beta waves once, during the middle segment of "Marvel's Agents of S.H.I.E.L.D."

Research question four asks whether or not participants who have seen all Marvel content types are more or less engaged with the media compared to those who have not seen all content types. Participants “Tango” and “Yankee” reported not seeing any of the three content being showed, while participants “Kilo” and “Foxtrot” reported seeing all three, or at least parts of all three of a similar series. “Tango” and “Yankee” both reported higher beta waves and no alpha waves compared to “Kilo” and “Foxtrot,” with the average readings being as follows:

Tango—Daredevil: beta levels; Avengers: high beta levels; S.H.I.E.L.D.: high beta levels

Yankee—Daredevil: high beta levels; Avengers: beta levels; S.H.I.E.L.D.: high beta levels

Kilo—Daredevil: beta levels; Avengers: beta levels; S.H.I.E.L.D.: beta levels

Foxtrot—Daredevil: alpha levels; Avengers: low beta levels; S.H.I.E.L.D.: alpha levels

Because of the lower levels of brainwave activity for participants who have already viewed the content before, it can reasonably be assumed that engagement with media lessens as one becomes more familiar with the exact plot, storyline, or content therein. Comparatively, individuals who are viewing content for the first time are more engaged with the media than those who are familiar with it.

Hypothesis one, the null already partially accepted from Group Alpha, states that participants will be more engaged with the streaming show than any other media type. Further supporting the findings of Group Alpha, Group Beta participants were least engaged with the streaming show “Daredevil” as compared to the other two media types being shown, allowing the researcher to fully accept the null and conclude the opposite of this hypothesis.

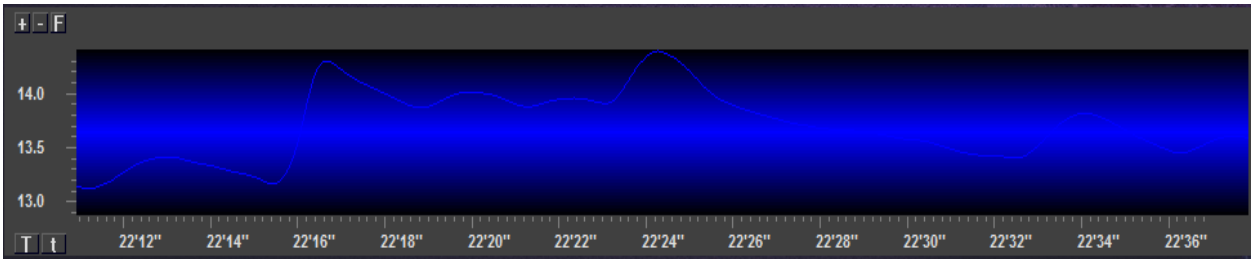
The final hypothesis of this study suggests that the Marvel streaming show and television show will be able to engage the participants sooner than the movie. Overall, the first 5 minutes of

“The Avengers” engaged three participants more than the other media types, whereas “Marvel’s Agents of S.H.I.E.L.D.” engaged the remaining two participants earlier on. Because of the majority of participants becoming more engaged with “The Avengers” during the first five minutes, the null hypothesis has been accepted and the opposite conclusion drawn.

GSR. Three galvanic skin response rates were chosen at random from participants to corroborate EEG findings. Readings in a non-disclosed unit measurement were computed by the BioTrace+ software, with higher numbers indicating more peaks in arousal for GSR and lower numbers indicating less arousal with the stimuli.

Participant “Yankee” had the same first, second, and third arousal and engagement ratings with GSR and EEG readings, respectively. For both biofeedback data, “Marvel’s Agents of S.H.I.E.L.D.” produced the most engagement and arousal, with average GSR readings being 11.5 K ohms. “Daredevil” was the second for both EEG engagement averages and for GSR K ohms feedback at 11.1. A line graph of two peaks from participant “Yankee’s” GSR readings during “Marvel’s Agents of S.H.I.E.L.D.” can be seen in Figure 3 below. These peaks occurred at 22 minutes and 16 seconds and 22 minutes and 24 seconds into the biofeedback session, at the same moment in the media during the middle 5 minute screening.

Figure 3. GSR graph of participant "Yankee" and two moments of arousal within for "Marvel's Agents of S.H.I.E.L.D.



The same media was both the most arousing based on GSR feedback and EEG feedback for participant "Whiskey." GSR readings for "The Avengers" were 11.4 K ohms. However, the media that proved to have the second highest averages of brainwave activity, indicating more engagement with the media, did not match with the second highest average of GSR. Whereas "Marvel's Agents of S.H.I.E.L.D." produced more beta brainwave activity than "Daredevil" for this participant, galvanic skin response rates were higher for "Daredevil" than "Marvel's Agents of S.H.I.E.L.D." at 7.8 K ohms and 7.2 K ohms respectively.

Neither the first nor second GSR rates matched for participant "Tango." Whereas EEG rankings for overall engagement average were, in order of most engaged to least engaged, "The Avengers," "Marvel's Agents of S.H.I.E.L.D.," and "Daredevil," the order of highest GSR rates for "Tango" was as follows: "Marvel's Agents of S.H.I.E.L.D.," "Daredevil," and "The Avengers." It should be noted, however, that the K ohms were so low for this participant, that the feedback was brought into question, with each media type eliciting the following results: "Marvel's Agents of S.H.I.E.L.D." (3.7 K ohms), "Daredevil" (1.7), and "The Avengers" (1.4).

Overall, GSR rates were not consistent enough to count as a good indicator of engagement for this particular study, and were discounted as a method of analysis to answer the research questions and hypotheses within this study. Further analysis on the rest of the participants' GSR rates were, therefore, not analyzed nor compared to EEG readings.

Discussion

Overall, the Marvel Cinematic Universe appeared to be consistently engaging with each individual's brainwave feedback. While significant results varied across Group Alpha, participants primarily enjoyed Marvel movies the most, which strengthened Group Beta's brainwave findings and helped to support the interpretation of the results within this category. While most participants enjoyed the Marvel movie category the most, there was enough evidence to suggest that the overall transmedia experience was a successful one for the Marvel Cinematic Universe. A discussion of each result, limitations to this study, and suggestions for future research follows.

Results

The results of this research indicated that various levels of brainwave patterns were present during session screenings of the content. Consistency of the brainwaves was maintained throughout all five participants (RQ3), with galvanic skin response rates being fairly consistent within each participant, but not necessarily between participants. This finding is believed to primarily be a fault of the mechanism used to record and then translate the data into numerical form for analysis. The partnering up of brainwave levels and GSR rates to the specific media type did, however, remain fairly consistent throughout all three participants who had their GSR rates measured. This is discussed in more detail later.

Three of the five participants primarily showed beta waves during the majority of the screenings, indicating that they were being "transported" by and engaging with the content (RQ1). These individuals also had a consistent range of beta and high beta waves for the average viewing of each content type. Beta and high beta waves respectively represent high engagement levels and complex thought and excitement (Heraz & Frasson, 2011). Transportation theory pairs

nicely with the results of this study, as the theory states that people tend to become so engaged with content that they become "transported" to a different state of mind, and that their attitudes and intentions change to reflect that story during or immediately following consumption of it (Green, 2008; Van Laer, De Ruyter, Visconti, & Wetzels, 2014). With the vagueness of this theory, however, it can be concluded that not everyone is transported in the same sense. For one individual, a certain external stimulus, such as content from the Marvel Cinematic Universe, could set an individual's train of thought off and cause them to passively think of a scenario presented therein, which, in turn, would cause lower frequency brainwaves, such as low beta waves or alpha waves, to be present. Since engagement was the primary focus of this study, though, transportation was considered to occur at the presence of low beta waves or higher.

Hypotheses one and two were disproven and the null accepted as streaming shows did not cause the most engagement with individuals. In fact, both participant groups indicated, at significant levels, that movies were both the most interesting and kept their interest for the longest amount of time. Enjoyment levels of participants in Group Alpha were significantly different between movies and television shows, and movies and streaming shows, with movies being the most popular form of content from the MCU. This could be due, in part, to the different fan levels of the participants engaging with the content. That is, perhaps those who enjoyed the television or streaming shows more would be considered more intense fans of the MCU, while the other participants, while having seen at least one episode of both show categories, could have just been curious enough to watch the shows, but did not enjoy them enough to continue following the story arch. MCU geek culture, or those fans who are obsessed and follow every MCU release, could be further assessed given this direction, and differences

between types of fans and the way individuals enter the transmedia atmosphere of Marvel could analyzed.

The brainwaves of individuals in Group Beta also helped to disprove hypotheses one and two, as three of the five participants had higher levels of engagement with "The Avengers" than any other content viewed. Both individuals who had alpha waves present during their session were engaged most with "The Avengers," the order of which the media being presented different. In relation to this, "The Avengers" was shown first, second, and third with different participants, eliminating the possibility of participants anticipating the final content or being overly engaged with the study at the onset. The second content from the MCU which participants engaged with the most was "Marvel's Agents of S.H.I.E.L.D." The final two participants had slightly higher brain frequencies for this show than the other two media. It could be hypothesized that this finding is the result of some participants feeling more connected to the characters being presented in the television show than the streaming show and movie.

Findings of which media type engaged participants quicker (H2) revealed that "The Avengers" and "Marvel's Agents of S.H.I.E.L.D." had, again, the most participants engaging with at an earlier time, with three and then two participants, respectively, having higher brainwaves within the first 5 minutes. The initial reasoning behind the television series and streaming show being able to sweep viewers in earlier than the movie was that these shows had a shorter run time and that they were meant to have a consistent story arch throughout. "Daredevil" was particularly thought to engage participants the most because of the platform on which it was presented. With streaming shows, viewers are able to "binge watch" multiple episodes in one sitting. It was originally believed that because of this, viewers would be engaged with the streaming show in such a way that they would want to continue watching the rest of the season.

However, the exact opposite was found — which is equally as telling. It can now be hypothesized that since “Daredevil” was not the most engaging media for all participants, that streaming media relies on viewers to “binge watch” content despite interest or engagement with it. That is, perhaps viewers are more likely to give the next episode of a streaming show a chance since the entire season is already available, and that the writers and producers of streaming shows are aware of this and create a story arch with a flatter kurtosis to its bell curve, the primary drama or action taking place over a more extended amount of time. This is not true of television series which require a certain level of engagement and interaction from audience members at each episode, enough to have them return the following week and to stay “hooked” on the series. Movies, on the other hand, are complete at the end of the film and do not require a “hook” to have viewers come back next week, since movies require more production time and larger budgets.

The findings of Group Alpha echoed the findings of Group Beta. Time and time again, “The Avengers” was shown to be the most enjoyable form of content, while the other media types differed significantly with ratings of television, and between streaming shows and self-reported ratings of engagement. This can be boiled down to a simple human rational — the majority of time, when asked, people report that they enjoy one thing over another thing.

Since this study’s main purpose was to look at transmedia, RQ3 was the primary interest. If brainwaves were consistent throughout each participant’s viewing session. That is, does each participant engage with each media type at similar levels. Findings revealed that this was true. Only one participant jumped more than one level of brainwave between media. Participant “Whiskey” primarily displayed alpha waves throughout the first two media sessions (“Marvels Agents of S.H.I.E.L.D.” and “Daredevil”), but then jumped to averaging high beta waves for the

final viewing session of "The Avengers," three levels of difference. Every other participant either went from one level to the next, staying relatively consistent throughout each media type. The one participant who jumped levels could have done so because of this individual was anticipating the end of the study and preparing to leave the study, resulting in more brain activity, but not necessarily more engagement with the media being presented.

Because of the consistency with most participants, this researcher concluded that the MCU is able to keep participants engaged with each media type at similar levels, despite preferences for a particular media or story over another media or story.

Limitations

Limitations to this study primarily focused around the lack of rights to show the entire film, television show, and streaming media to participants. Engagement results could have been skewed because of the disruption between segments shown. It can be reasonably assumed that this disturbance slightly skewed Group Beta participants' actual EEG/GSR engagement levels.

A major limitation of this study included the lack of participants within Group Beta. Because of this, comparing engagement levels and determining how effective the MCU was in their cinematic transmedia efforts was difficult. With small sample sizes, correlation regressions and bivariate analyses were not able to be performed on the brainwave feedback and comparative surveys. The surveys, instead, were used as a way to determine which media participants had and had not seen before having an electroencephalogram.

For Group Alpha, a major limitation was finding individuals who had watched at least one MCU show in each category. Most initial participants had seen at least one Marvel movie, but fewer had viewed one of the television shows and even fewer had seen a streaming show. This limitation resulted in fewer participants than warranted, but was telling in itself. That is, it

can be inferred that the majority of initial participants were only casual fans, limiting their involvement in the culture to the big screen and not wishing to further explore the story world.

Continuing with limitations of the survey, while two of the scales were tested for internal reliability (see results), they were not measured against an outside source with similar scales to determine how well it actually measured engagement and participation. While the internal reliability for the two scales used were relatively high, it could be reasonably assumed that the scales created for this study would not match up against others. The further development of both a reliable and valid survey assessment is needed.

One of the biggest limitations of this study existed within Group Beta. When recording sensitive biofeedback, nearly any stimuli could be distracting the participants, leading to skewed readings and misinterpreted results. The laboratory room used for this study was seemingly quiet, lit at an appropriate level for the media being shown, and devoid of most scent. However, there were occasions when outside stimuli could have affected the participants. Throughout different participants' sessions, dogs would bark, construction noises were present, and two sessions were interrupted because of outside individuals accidentally entering the room, distracting the participants and perhaps affecting their engagement with the media. Furthermore, the presence of the researcher within the room could have caused the participants to be slightly on edge, affecting their engagement levels.

Since this study was primarily performed with participants from a dominantly Christian region at a southeastern university in southcentral Virginia, the generalizability of it could be brought into question. This study should, then, be considered a precursor to future studies generalizing and either supporting or disproving the results found within. Furthermore, the small sample size of Group Beta makes the EEG findings less generalizable than initially warranted.

When exporting the brainwave data for this study, over one billion numbers had to be analyzed in order to determine the average brainwaves and GSR rates of individuals. Each segment of each media type was separated from the original document and then an average brainwave and GSR rate was calculated. Because of this, quantifying the brainwaves and GSR could have resulted in human recoding error, and particular moments of impressive brainwave and GSR feedback could have been missed.

A final limitation to this study exists in the lack of research in this area. There exists, to this researcher's knowledge, no other EEG/GSR study done on transmedia. Because of this, it is difficult to assess whether or not the results found within this study correspond with expected findings. Furthermore, direction was difficult to gauge and a larger amount of research questions and hypotheses needed to be addressed in order to make more of a path in this particular field of study.

Future Research

Further research into the topic of transmedia is needed, but of particular necessity is additional studies done at quantitative, neurological, and physiological levels. Additional research done with a more diverse group of participants would help generalize the findings in this study. Without a "basic" comparison group to judge against, the findings that exist can only be expressed towards those types of individuals who match the participants within. To help eliminate this, a larger sample size should also be looked at.

Watching the entire movies/television shows/streaming shows would add a needed element to this study and those done in the future. Because of licensing and copyright laws, most content cannot be shown in its entirety to participants. However, if proper arrangements were made, future research could allow for this limitation to be eliminated and a more in depth look at

engagement could be made. With the massive amounts of data received from even a short session of EEG/GSR testing, this particular task would be a large one to tackle.

To look at engagement within transmedia with a more broad focus, instead of just at the cinematic elements of this concept, incorporating other Marvel content (video games, web apps, comic books, etc.) needs to be addressed. In addition to this, it would be interesting for future researchers to differentiate between the levels of Marvel fans.

Stemming off of this, future research into the culture of mega Marvel fans (or even "geek culture" as a whole) as they engage with transmedia devices would make for an interesting study. The differences between fans and non-fans and the level to which they interact with content with a more holistic approach could provide unique insights into a group that identifies not as a particular gender, race, or sexual orientation, but instead as a self-selected group. It would also be interesting to look at not only cinematic transmedia within the Marvel universe, but also print and other forms of media content. The differences could help researchers better understand the starting point of "fandom" for participants, and if the initial introduction into the transmedia universe matters. That is, if those participants who deem themselves to be mega fans significantly differ in engagement levels with content via neurofeedback technologies depending on what form of media they were first introduced to the universe by.

Future research within transmedia could also include measuring anticipation for upcoming content within a particular transmedia world compared to actually viewing the content, and then noting how participants interact with other transmedia segments to prepare for the release. After assessing this, researchers could look at whether or not the amount of preparation for the release of a transmedia content affects engagement levels with the finalized entertainment.

How individuals initially view or gain access to transmedia entertainment should also be assessed, and then these different mediums should be looked at quantitatively by both neurofeedback data and questionnaire or survey results. There could exist significant results between individuals who wait for movie and television media to become available on streaming sites such as HuluPlus or Netflix compared to those who go to the theatre or watch on their traditional boxset. Assessing whether or not there are differences could further corroborate Marshall McLuhan's "the medium is the message" theory, and give transmedia a stronger leg to stand on in a theoretical context.

Research on successful transmedia ventures other than the Marvel Cinematic Universe should also be looked at using biofeedback techniques, to help determine whether or not the findings within this study are specific to the MCU or more generalizable to transmedia as a whole. Looking at transmedia in all different platforms (print, broadcast, interactive gaming, etc.) could lead to significantly different findings than the results discussed in the present study.

Additionally, differences between demographics should be explored in regards to biofeedback and transmedia experiences. As gender differences exist in relatively every field of study, seeing if they are significantly different in transmedia from traditional non-transmedia entertainment would be an interesting comparison. Education level, occupation, age, and culture would also be interesting things to look at in regards of transmedia engagement.

Conclusion

Cinematic transmedia, a relatively new concept given the vast history of entertainment, engages participants at different levels depending on familiarity with the content, and interest therein. Scholarly interest in transmedia has taken off exponentially and in correlation with the continuous expansion of the Marvel Cinematic Universe. Despite the studies already completed

regarding transmedia, there exists nothing on biofeedback in relation to this topic — something that can help turn transmedia from a concept, to a full blown theory of communication studies. In order for this to be possible, engagement levels within viewers need to be relatively consistent in successful transmedia adventures, and a financial and box office success need to echo these findings.

While the Marvel Cinematic Universe is just one of the successful transmedia experiences available to audiences today, the continued development of entertainment media will eventually give rise to more significantly popular media expansions. Because of this, there is a need for more research circling around the new media concepts. Transmedia will eventually need to be further defined and categorized as entertainment continues to stretch the boundaries of interaction with audience members.

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Appendices

Appendix A

(Please note: the question number was not visible to the participants.)

Q1 I am at least 18 years old.

- ❍ Yes
- ❍ No

Q2 By continuing with this survey, I understand and agree to the following: (CONSENT FORM WAS VISABLE HERE)

- ❍ Yes
- ❍ No

Q3 I have seen the following Marvel films (check all that apply):

- ❑ Iron Man
- ❑ Iron Man 2
- ❑ Iron Man 3
- ❑ Captain America: The First Avenger
- ❑ Captain America: The Winter Soldier
- ❑ Thor
- ❑ Thor: The Dark World
- ❑ The Avengers
- ❑ The Avengers: Age of Ultron
- ❑ The Incredible Hulk (2008)
- ❑ Guardians of the Galaxy
- ❑ Ant Man
- ❑ None of the above

Q4 I have seen at least one episode of the following (check all that apply):

- ❑ Marvel's Agents of S.H.I.E.L.D.
- ❑ Agent Carter
- ❑ None of the above

Q5 I have seen at least one episode of the following shows on Netflix (check all that apply):

- ❑ Daredevil
- ❑ Jessica Jones
- ❑ None of the above

Q7 The following set of questions deal with the Marvel movie(s) you indicated having watched, please select how much you agree or disagree with each statement.

Q8 The Marvel movie(s) I watched developed slowly, at a pace that caused me to lose interest in the film.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q9 The Marvel movie(s) I watched made me want to know more about the story world the characters existed in.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q10 The movie(s) told a cohesive story from start to finish.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q11 There was a fresh level of excitement with each new plot twist in the Marvel movie(s).

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q12 The story line in the Marvel movie(s) I watched was compelling.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q13 The Marvel movie(s) had good special effects.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q14 The plot was enjoyable for the Marvel movie(s) I watched.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q16 I wanted to research more about the Marvel world after watching the movie(s).

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q17 My interest was kept for at least the first 10 minutes of the Marvel movie(s) I viewed.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q15 The Marvel movie(s) was able to keep my interest throughout the entire film(s).

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q18 The following set of questions deal with the Marvel television show(s) (either Marvel Agents of S.H.I.E.L.D. or Agent Carter) you indicated having watched, please select how much you agree or disagree with each statement.

Q19 The Marvel television show(s) I watched developed slowly, at a pace that caused me to lose interest in the show.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q22 The Marvel television show(s) I watched made me want to know more about the story world the characters existed in.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q24 The television show(s) told a cohesive story from start to finish.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q26 There was a fresh level of excitement with each new plot twist in the Marvel television show(s).

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q28 The story line in the Marvel television show(s) I watched was compelling.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q29 The Marvel television show(s) had good special effects.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q30 The plot was enjoyable for the Marvel television show(s) I watched.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q31 I wanted to research more about the Marvel world after watching the television show(s).

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q32 My interest was kept for at least the first 10 minutes of the Marvel television show(s) I viewed.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q33 The Marvel television show(s) was able to keep my interest throughout the entire production.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q20 The following set of questions deal with the Marvel streaming (Netflix) series (either Daredevil or Jessica Jones) you indicated having watched, please select how much you agree or disagree with each statement.

Q21 The Marvel streaming series I watched developed slowly, at a pace that caused me to lose interest in the show.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q23 The Marvel streaming series I watched made me want to know more about the story world the characters existed in.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q25 The streaming series told a cohesive story from start to finish.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q27 There was a fresh level of excitement with each new plot twist in the Marvel streaming series.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q34 The story line in the Marvel streaming series I watched was compelling.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q35 The Marvel streaming series had good special effects.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q36 The plot was enjoyable for the Marvel streaming series I watched.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q37 I wanted to research more about the Marvel world after watching the streaming series.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q38 My interest was kept for at least the first 10 minutes of the Marvel streaming series I viewed.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q39 The Marvel streaming series was able to keep my interest throughout the entire show.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q41 On a scale of 1 to 10, with 1 being the lowest and 10 being the highest, please indicate how engaged you were with each of the following types of media.

	1 (least engaged)	2	3	4	5	6	7	8	9	10 (most engaged)
Marvel Movies (including: the Iron Man series, the Thor series, the Captain America series, The Incredible Hulk, The Avengers series, Guardians of the Galaxy, and/or Antman)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Marvel Television Shows (including: Marvel's Agents of S.H.I.E.L.D. and/or Agent Carter)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Marvel Streaming Shows (including: Daredevil and/or Jessica Jones)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Q43 Thinking of the Marvel Cinematic Universe (MCU) as one entity (including movies, television, and streaming shows), please indicate how engaged you were with the entire MCU by selecting how much you agree or disagree with each of the following statements.

Q44 I felt involved in the different MCU content that I viewed.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q45 I felt as if I was part of the story world when watching something from the MCU.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q46 Nothing can distract me when I am watching something from the MCU.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q47 I have to watch a Marvel movie from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q48 I have to watch a Marvel television show from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q49 I have to binge watch (viewing multiple content episodes in successive order without pausing in between each natural content break) a Marvel television show's entire season from start to finish, or as closely as time allows, or else I am not fully engaged in the story.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q50 I have to watch a Marvel streaming series from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q51 I have to binge watch (viewing multiple content episodes in successive order without pausing in between each natural content break) a Marvel streaming series' entire season from start to finish, or as closely as time allows, or else I am not fully engaged in the story.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q53 Which of the following media types do you enjoy the most?

- ❍ Marvel Movies
- ❍ Marvel Television Shows
- ❍ Marvel Streaming Series

Q65 Which media type from the following three categories keeps your interest for the longest amount of time?

- ❍ Marvel Movies
- ❍ Marvel Television Shows
- ❍ Marvel Streaming Series

Q52 This next set of questions deals with your perception of the Marvel Cinematic Universe (MCU). Please indicate how much you agree or disagree with each of the following statements.

Q54 The MCU is cutting-edge and innovating.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q55 The MCU has set the standard for compelling storytelling.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q56 The MCU is exciting.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q57 The MCU keeps my attention.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q58 I get excited for the release of new content whenever it is announced.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q59 The MCU is able to effectively transfer between media types (movies to TV shows, for example) while maintaining the integrity of the story world.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q66 After watching something from the MCU, I feel compelled to learn a new skill like the characters in the media.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Q60 The next set of questions deals with how you view content from the MCU.

Q61 I watched the majority of the Marvel content on which type of media?

- ❍ At a movie theater
- ❍ On a laptop
- ❍ On a mobile device
- ❍ On a television set

Q62 I watched the Marvel movies (the majority of the time):

- ❍ At a movie theater
- ❍ On my laptop
- ❍ On a mobile device
- ❍ On a television set

Q63 I watched the Marvel television shows (the majority of the time):

- ❍ On my laptop
- ❍ On a mobile device
- ❍ On a television

Q64 I watched the Marvel streaming series (the majority of the time):

- ❍ On my laptop
- ❍ On a mobile device

Q69 The next set of questions deals with your demographics.

Q70 Please select your gender.

- ❍ Male
- ❍ Female

Q71 Please select your age range.

- ❍ 18-22
- ❍ 23-25
- ❍ 26-30
- ❍ 31-35
- ❍ 36-40
- ❍ 41-45
- ❍ 46-50
- ❍ 51-55
- ❍ 56-60
- ❍ 61-65
- ❍ 66-70
- ❍ 70 and older

Q72 Please select your employment status.

- ❍ Full-time employee
- ❍ Part-time employee
- ❍ Student
- ❍ Retiree
- ❍ Other (please explain) _____

Q73 Please select the area you live in (if you are a student or in the military, please select the area you most closely consider "home")

- ❍ The Southeast of America (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)
- ❍ The Northeast of America (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)
- ❍ The Midwest of America (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)
- ❍ The Southwest of America (AZ, NM, OK, TX)
- ❍ The West of America (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)
- ❍ Canada
- ❍ Mexico
- ❍ A country located in Europe
- ❍ A country located in Central America
- ❍ A country located in South America
- ❍ A country located in Asia
- ❍ A country located in Oceanica
- ❍ Other (please explain) _____

Q74 Please select your highest level of education (if you are a student, please select the degree you last achieved, or the one you will be awarded if graduating within the next semester).

- ❍ G.E.D.
- ❍ High school diploma
- ❍ Associate's degree
- ❍ Bachelor's degree
- ❍ Master's degree
- ❍ MFA
- ❍ MBA
- ❍ PhD
- ❍ MD
- ❍ Juris Doctorate
- ❍ Other (please explain) _____

Appendix B

Thank you for agreeing to take part in this study. Please note that your responses will be kept confidential.

DIRECTIONS: Please answer each question as truthfully as possible. If at any time you have any questions, please feel free to ask the researcher present in the room with you.

(THIS SECTION INTENTIONALLY LEFT BLANK)

SECTION ONE

The following set of questions deal with the Marvel movie(s), television show(s), and streaming show(s) you have watched (either in their entirety or the clips viewed during this study). Please select how much you agree or disagree with each of the following statements.

1.) The Marvel content I watched developed slowly, at a pace that caused me to lose interest in the film.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

2.) The Marvel content I watched made me want to know more about the story world the characters existed in.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

3.) The content told a cohesive story from start to finish.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

4.) There was a fresh level of excitement with each new plot twist in the Marvel content

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

5.) The story line in the Marvel content I watched was compelling.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

6.) The Marvel content had good special effects.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

7.) The plot was enjoyable for the Marvel content I watched.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

8.) I wanted to research more about the Marvel world after watching the content.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

9.) My interest was kept for at least the first 10 minutes of the Marvel content I viewed.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

10.) The Marvel content was able to keep my interest throughout the entire run.

MOVIE: __Strongly Disagree __Disagree __Agree __Strongly Agree

TV SHOW: __Strongly Disagree __Disagree __Agree __Strongly Agree

STREAMING: __Strongly Disagree __Disagree __Agree __Strongly Agree

SECTION TWO

On a scale from 1 to 10, with 1 being the lowest and 10 being the highest, please indicate how engaged you were with each of the following types of media.

1.) Marvel Movies (including Iron Man, Thor, The Avengers, etc.):

__1 __2 __3 __4 __5 __6 __7 __8 __9 __10

2.) Marvel Television Shows (including Agent Carter and Agents of S.H.I.E.L.D.):

__1 __2 __3 __4 __5 __6 __7 __8 __9 __10

3.) Marvel Streaming Shows (including Daredevil and Jessica Jones:

__1 __2 __3 __4 __5 __6 __7 __8 __9 __10

SECTION THREE

Thinking of the Marvel Cinematic Universe (MCU) as one entity (including movies, television, and streaming shows), please indicate how engaged you were with the entire MCU by selecting how much you agree or disagree with each of the following statements.

1.) I felt involved in the different MCU content that I viewed.

__Strongly Disagree __Disagree __Agree __Strongly Agree

2.) I felt as if I was part of the story world when watching something from the MCU.

__Strongly Disagree __Disagree __Agree __Strongly Agree

3.) Nothing can distract me when I am watching something from the MCU.

__Strongly Disagree __Disagree __Agree __Strongly Agree

4.) I have to watch a Marvel movie from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

5.) I have to watch a Marvel television show from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

6.) I have to binge watch (viewing multiple content episodes in successive order without pausing in between each natural content break) a Marvel show's entire season from start to finish, or as closely as time allows, or else I am not fully engaged in the story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

7.) I have to watch a Marvel streaming series from start to finish without pausing it or coming back to it later, or else I am not fully engaged in the story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

8.) I have to binge watch a Marvel streaming series' entire season from start to finish, or as closely as time allows, or else I am not fully engaged in the story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

SECTION FOUR

1.) Which of the following media types do you enjoy the most?

__Marvel movies __Marvel television shows __Marvel streaming series

2.) Which media type keeps your interest for the longest amount of time?

__Marvel movies __Marvel television shows __Marvel streaming series

SECTION FIVE

This next set of questions deals with your perception of the Marvel Cinematic Universe (MCU). Please indicate how much you agree or disagree with each of the following statements.

1.) The MCU is cutting-edge and innovating.

__Strongly Disagree __Disagree __Agree __Strongly Agree

2.) The MCU has set the standard for compelling storytelling.

__Strongly Disagree __Disagree __Agree __Strongly Agree

3.) The MCU is exciting.

__Strongly Disagree __Disagree __Agree __Strongly Agree

4.) The MCU keeps my attention.

__Strongly Disagree __Disagree __Agree __Strongly Agree

5.) I get excited for the release of new content whenever it is announced.

__Strongly Disagree __Disagree __Agree __Strongly Agree

6.) The MCU is able to effectively transfer between media types (movies to TV shows, for example) while maintaining the integrity of the story world.

__Strongly Disagree __Disagree __Agree __Strongly Agree

7.) After watching something from the MCU, I feel compelled to learn a new skill like the characters in the media.

__Strongly Disagree __Disagree __Agree __Strongly Agree

Appendix C

Thank you for agreeing to take part in this study. Please note that your responses will be kept confidential.

DIRECTIONS: Please answer each question as truthfully as possible. If at any time you have any questions, please feel free to ask the researcher present in the room with you.

(THIS SECTION INTENTIONALLY LEFT BLANK)

SECTION ONE

1.) I am more likely to enjoy which of the following movie, television, or other entertainment genres (select all that apply by placing a "X" or check mark next to the corresponding genre):

Action	
Adventure	
Comedy	
Crime or Gangster	
Drama	
Epic/Historical	
Horror	
Musicals/Dance	
Science Fiction	
War	
Westerns	
Romance	
Romantic Comedy	
Foreign Films	
Documentaries/Reality	

SECTION TWO

Please select how much you agree or disagree with each of the following statements.

1.) I am more likely to watch a movie or television show if I know of and like the actors/actresses in it.

__Strongly Disagree __Disagree __Agree __Strongly Agree

2.) I watch movies and television shows when they first debut.

__Strongly Disagree __Disagree __Agree __Strongly Agree

3.) I wait for a movie or television show to get a reputation before I spend my time viewing it.

__Strongly Disagree __Disagree __Agree __Strongly Agree

4.) I tend to choose movies or television shows based on the visual effects they are rumored to have.

__Strongly Disagree __Disagree __Agree __Strongly Agree

5.) I enjoy movies and television shows with complicated plots.

__Strongly Disagree __Disagree __Agree __Strongly Agree

6.) I like being able to get more information about the characters in a movie or television show after the program has ended.

__Strongly Disagree __Disagree __Agree __Strongly Agree

7.) I usually watch sequels to movies.

__Strongly Disagree __Disagree __Agree __Strongly Agree

8.) My decision to watch a movie or television show is largely based on an intriguing trailer or promotional video.

__Strongly Disagree __Disagree __Agree __Strongly Agree

9.) My decision to watch a movie or television show is largely based on positive reviews from critics and friends.

__Strongly Disagree __Disagree __Agree __Strongly Agree

10.) I enjoy movies or television shows whose characters can cross over into another movie or television show and continue with their original story.

__Strongly Disagree __Disagree __Agree __Strongly Agree

SECTION THREE

1.) Please select all of the content you have seen below. For television (TV) and streaming shows (SS), you need to have seen at least 1 episode in its entirety in order to select it.

Iron Man	
Iron Man 2	
Iron Man 3	
Captain America: The First Avenger	
Captain America: The Winter Soldier	
Thor	
Thor: The Dark World	
The Avengers	
The Avengers: Age of Ultron	
The Incredible Hulk (2008)	
The Guardians of the Galaxy	
Ant Man	
Deadpool	
Marvel's Agents of S.H.I.E.L.D. (TV)	
Agent Carter (TV)	

Daredevil (SS)	
Jessica Jones (SS)	

Please select how much you agree or disagree with each of the following statements:

2.) I am very familiar with the Marvel Cinematic Universe

__Strongly Disagree __Disagree __Agree __Strongly Agree

3.) I am well-versed in Marvel Comic Book literature

__Strongly Disagree __Disagree __Agree __Strongly Agree

4.) I would consider myself a Marvel superhero expert

__Strongly Disagree __Disagree __Agree __Strongly Agree

SECTION FOUR

Please select all that apply.

1.) I generally watch **movies**:

__At the theater __On a television set __On my laptop __On a mobile or tablet device

__I do not watch movies

2.) I generally gain access to **movies** by:

__Going to the movie theater
__Streaming them through a third party website such as Netflix or Hulu
__Streaming them through a file-sharing site
__Downloading them through a pirate site
__Purchasing the movie on DVD
__Renting the movie from a video store or RedBox
__Renting the movie from a PayPerView or Streaming site
__Watching them on TV

__I do not watch movies

3.) I generally watch **television shows**:

__On my television set by means of a cable or satellite provider
__On my television set through a streaming device like Amazon Fire TV Stick
__On my laptop through a third party site such as HuluPlus or Netflix

__On my laptop through the network's website, such as CBS.com
__On my mobile or tablet device through a mobile app such as HuluPlus
__On YouTube
__On my laptop through a pirated site

__I do not watch television shows

4.) I generally watch **streaming shows** (such as Orange is the New Black):
__On my laptop through a third party site such as HuluPlus or Netflix
__On my mobile or tablet device through a mobile app such as HuluPlus
__On YouTube
__On my laptop through a pirated site

__I do not watch streaming shows

SECTION FIVE
Please answer each question.

1.) Please record your age on your last birthday: _____
2.) Please select your gender: ___Male ___Female

3.) What is the highest level of education you have achieved?
__High school graduate or less
__Some college but no degree
__Associate degree
__Bachelor's degree
__Master's degree (MA, MS, MBA, etc.)
__Professional degree (law or medicine)
__Doctoral degree (Ph.D.)

4.) Please select which ethnicity you most closely identify with:
__African American or Black
__Asian or Pacific Islander
__Caucasian or White
__Hispanic or Latino
__Native America or American Indian
__Other (please specify: _____)

5.) Please state which country in which you have citizenship (i.e. America, Canada, Nigeria, etc.)
_____

6.) Please select your religious affiliation:
__Mormon
__Jewish
__Roman Catholic
__Protestant
__Muslim
__Agnostic
__Atheist
__Other (please specify: _____)

Appendix D

(Sample screen of a basic EEG/GSR session)