

Semiotic Analysis on The Podcast "How to Build Muscle" on Huberman Lab Clips YouTube Channel

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ABSTRACT

Nowadays, fitness podcasts are becoming popular, they now influence the public's perception of science and the body. This study analyzes how Huberman Lab podcast episode "How to Build Muscle" explains scientific knowledge about muscle hypertrophy and is understood in different cultures. The most important part is to uncover the various meanings in the podcast's words using Roland Barthes' theory. A research design using qualitative methods. Data from the official podcast video and text were used, which were then studied through a model with three steps: reducing data, presenting it, and coming to conclusions. Barthes' theory was used to find out the denotative, connotative, and myth meanings in certain chosen excerpts. It is found that scientific explanations in the podcast help transmit facts, yet also back up cultural views on having an 'ideal body', male/female differences, and the power of science. It is clear from the results that modern fitness discussion combines facts about biology with different ideologies. By exploring this area, the study helps readers gain a new way to view the role of scientific communication in popular media on people's views of identity, health, and the body.

I. Introduction

Nowadays, through the internet, we can do anything, such as seeking entertainment, doing business, searching for news, seeking knowledge, socializing, and showcasing our work in the form of images, videos, writing, and audio. Examples in the form of images include digital images, posters, and so on. Examples in the form of videos include video blogs and short videos, while examples in the form of writing include blogs, and examples in the form of audio include podcasts. Podcasts offer a convenient way to spread simple and complex ideas to a wide variety of people [1]. A combination of facts and casual delivery makes them useful for sharing difficult science with anyone. The podcast by Stanford's neuroscientist, Andrew Huberman, is a good example. During "How to Build Muscle," Dr. Huberman speaks with Dr. Andy Galpin, a kinesiology professor, about the process of muscle growth. The material explains biology related to muscle, plus different exercises, all made easy to grasp and understand.

Because podcasts use different methods to deliver information, recognizing how meaning is put together is very important. Semiotics gives us a useful tool to examine the process of meaning creation. It explores the information itself as well as the hidden cultural and ideological meanings that guide the way people understand it. This study uses semiotics as its main tool to discover how meaning is formed in this content. Semiotics reveals what influences communication, besides what we can see. In Mertz's view, semiotics makes it possible for us to analyze both the meaning of a message and how effectively it was delivered in a given culture [2]. Since health and fitness frequently involve both learning and social customs, analyzing signs and symbols is important. Semiotics allows us to uncover both the contents of messages and why and how they work. This study follows Roland Barthes' ideas and categorizes meaning into denotation, connotation, and myth.

In Roland Barthes' semiotic analysis, signs are divided into several layers of meaning: denotative, connotative and mythical. Denotative meaning refers to the literal or basic meaning of a sign—that is, what is directly shown or said. Connotative meaning is a second meaning that is implicit and formed through certain cultural, emotional, or ideological associations; connotation forms a more complex layer of meaning above denotation. Meanwhile, myth in Barthes' framework does not mean fairy tales or fictional stories, but an ideological construction that works to naturalize connotative meanings, so that these meanings appear natural, natural, and unquestioned in society. In other words, myths are the result of a process of hidden meanings that serve to maintain dominant values in a culture.

Many researchers have proved that Roland Barthes' approach can be useful when studying podcast content on many themes. Most of these studies investigate the formation of meaning using denotation, connotation, and myths in various cultures. There is a major research focus on semiotics, and "*Analisis Semiotika Makna Kesedihan pada Transcript Podcast Rintik Sedu Episode Jalan Pulang*" [3] is an example examining signs of sadness in romantic episodes. Barthes' approach to semiotics was applied to find how podcasts in Indonesia use stories about broken hearts and unrequited love to form symbolic and mythic ideas. Semiotics is another subject focus used to study religious and ethical forms of communication. In the study "*Semiotic Analysis of Da'wah Messages in the Has Creative YouTube Podcast with Habib Husein Ja'far Al Hadar*" [4], the teachings of Islam are studied using the approach from Barthes, as the conveyance was done in a casual podcast by a host. Analyses also reveal that concepts like faith, patience, and moral responsibility are found in cultural religious symbols as well as in how characters speak, and all these messages impress Indonesian Muslim viewers. The next subject discussed focuses on the way people from different generations use digital media to communicate. The researchers in "*Semiotic Analysis of Millennial Communication Style of Bambang Soesatyo Through YouTube Podcast*" [5] study the ways in which YouTube podcasts fit into Bambang Soesatyo's way of talking. According to the study, a natural, easy-to-understand approach helps divide age groups and creates interest among younger people.

Roland Barthes' semiotic theory has been applied to analyze podcasts that talk about emotions, religion, and politics. However, attention to English-language scientific podcasts that discuss muscle building and are presented on YouTube has not been high. That, in turn, means there is a research gap, since such podcasts enrich science explanations with visual, auditory, and social elements.

The researchers investigate how discussions in health-related podcasts, for instance The Huberman Lab, create both knowledge on health and form ideas related to what a healthy body, discipline, and expertise involve in our society. The purpose of studying podcasts is they have features of traditional and digital information by fusing scientific knowledge, everyday talks, and multimedia into a program. Since action films are popular with many viewers, they spread and support popular ideas about fitness, gender roles, and changes to people's abilities.

Applying Barthes' theories in this research allows the researcher to study how stories from science are made into cultural legends in the media. What we learn from these discoveries may describe how health and fitness communication carries out its ideological purposes online, turning science accessible and convincing for the public.

This research focuses on exploring an episode of the podcast called "How to Build Muscle", where Dr. Huberman and Dr. Galpin talk about hypertrophy using language meant for the general public. The talk between these individuals provides a good opportunity to study how science and its experts are discussed in media. This research adopts Roland Barthes' semiotic theory in order to explain how science can carry hidden meanings and cultural stories.

In order to support the objectives of this study, the following research questions are proposed:

1. How are the denotative and connotative meanings of muscle building science shaped through the expert discussions between Dr. Andy Galpin and Dr. Andrew Huberman in the podcast episode?
2. What are the main myths about scientific knowledge and muscle growth that we can identify from the conversation between Dr. Huberman and Dr. Galpin?

It's clear from this research that it can be used to help in both academic and real-world situations. It suggests that studying semiotics can improve studies of media by analyzing examples of science communication found in culture. It tells people in healthcare, education, and media about the ways scientific authority influences body image in our society.

II. Method

This study employs a qualitative design method and text analysis to explore muscle gain as discussed in the “How to Build Muscles” podcast. According to [6], qualitative research is a type of research that explores and understands the meanings of a number of individuals or groups of people originating from social issues. Qualitative research can generally be used for research on community life, history, behavior, concepts, or phenomena, social issues, and so on. Based on Barthes, three levels of meaning are studied: literal, social, and myth. The recordings and official transcripts make up the main data, and the podcast episode was posted to the Huberman Lab channel on YouTube in 2024. All the information discussed is in the video, and every technical phrase and biological explanation is in the script, making sure nothing is lost.

Data is collected using two methods: documentation and non-participant observation. Documentation is a technique for collecting data by compiling and analyzing documents, whether written, pictorial, or electronic [7]. Observation is the act of directly observing an object in the environment, whether it is currently occurring or still ongoing, involving various activities of attention toward the subject of study using sensory perception [8]. Researchers look at video, audio, and records of data to review interpretations of signs. The team studied how the podcast delivered and shared information about science by observing objectively and without interfering. A recording of the official podcast was examined to confirm how scientific information was presented as words and images. The entire conversation was included in a transcript, major sections were categorized by Barthes’ system, and the recordings and transcript were matched to confirm each piece.

The qualitative method developed by [9] was used for the analysis, which involved three important parts: data collection, data reduction, data presentation, and conclusion drawing/verification. During the data reduction stage, the researcher selected data segments related to explanations of muscle hypertrophy. These segments were organized into an analytical matrix to enable a systematic review of three distinct signs simultaneously. At this stage, the researcher described and demonstrated the relationships between facts, cultural values, and myths present in the podcasts of scientific discussions. The final step is to compile the findings of this study to explain how scientific authority and knowledge about muscle formation are formed, legitimized, and explained through podcasts. In this way, the analysis highlights important information in the object under study.

III. Results and Discussion

Roland Barthes’ approach of denotation, connotation, and myth is used to examine important parts of the Huberman Lab podcast featuring Drs. Huberman and Galpin. Try to discover the cultural and ideological aspects together with the science part in their discussion of muscle hypertrophy. Five subsections are used in the discussion to make the discussion clear and organized. Below are key excerpts from the podcast selected for analysis, grouped by theme:

Table 1. Data Samples from Huberman Lab Podcast on Muscle Building	
Example	Original Quotation
Example 1: Hypertrophy Introduction	ANDREW HUBERMAN: "OK, let's talk about hypertrophy. The topic that occupies the minds of so many youth, young men, and also a lot of women. I think one of the really interesting progressions that's taken place in the last decade or so is that far more men and women are using resistance training to evoke hypertrophy, growth of muscles, for aesthetic reasons and for all sorts of reasons."
Example 2: Hypertrophy Mechanisms	ANDY GALPIN: "What's driving changes in strength and power are the adaptations of specificity. What's driving changes in hypertrophy is much more well-rounded. And so you have options to get there. Remember, you're training a movement and now you're training a response and a muscle that causes the growth. That's very, very different." ANDY GALPIN: "So all we really have to do is, going back to our dogma of activation of something on the cell wall, we've talked about this earlier. That's got to induce that signaling cascade. That's got to be strong enough to cause the nucleus to react to it, to go to the ribosomes, to initiate this entire cascade of protein synthesis."
Example 3: Training Approaches	ANDY GALPIN: "If we look at the classic dogma, we have to basically challenge the muscle to need to come back, in this case, specifically bigger. And the nutrients need to be there to support that growth... So that signal has to be one of a couple of things. It either has to be strong enough one time, it has to be frequent enough, or it has to be a combination of these things." ANDY GALPIN: "I can get there with a lot of frequency and a moderate signal. I can get there

	with very low frequency and a large signal, like more akin to what you do with Mike back in the day, I'm sure." ANDREW HUBERMAN: "And still train that way." ANDY GALPIN: "Still training that way." ANDREW HUBERMAN: "Each muscle group mainly once a week, directly, and once a week indirectly."
Example 4: Breaking Down Muscle Growth Pathways	ANDY GALPIN: "The only wrong combination here is infrequent and low intensity and low volume. That's it. As long as one of those three variables is high, you're going to get there. Because the mechanisms that are needed to activate that signaling cascade are wide ranging." ANDY GALPIN: "And this is why when we even see things like blood flow restriction training, this is when you put like a cuff on your arm or your leg and you block blood flow and you use no load or as low as, say, 30% of your maximum and, you take it to fatigue failure, that actually is an equally effective way of inducing hypertrophy... Why? Because you went through the route of metabolic disturbance. Other ways, say, a higher load, maybe as heavy as you can for, say, eight repetitions, is going to get through what's called mechanical tension."
Example 5: Muscle Breakdown Discussion	ANDY GALPIN: "And I know we want to chat a little bit about that, but none of these three are absolutely required. You can have multiple of them in a session. You don't have to have breakdown at all. That is a complete well, really, it's a flat out lie that you have to break a muscle down to cause it to grow. That's just not needed at all."

A.Hypertrophy Introduction

Essentially, according to Barthes, a sign directly expresses what it symbolizes, so the idea itself aligns with its form. Signs in text or images have denotative meanings (literal meanings) and connotative meanings (additional, deeper meanings) [10]. When we discuss denotative meaning here, we refer to the actual, factual science discussed by the speakers, including definitions, how the body responds, and exercise methods. For example, when Dr. Huberman says:

Example Quotation:

"OK, let's talk about hypertrophy. The topic that occupies the minds of so many youth, young men, and also a lot of women." — Andrew Huberman

"Hypertrophy," "youth," "men," and "women" are signifiers that describe what the biological process of muscle growth and resistance training means for such groups. Hypertrophy is intended as a medical condition [11], and in the podcast, it is explained to the general public in an easily understandable manner. It states that this layer focuses on the core message, in this case introducing readers to hypertrophy as a scientific term. The following table summarizes the denotative, connotative, and mythic meanings of this excerpt based on Barthes' semiotic model:

Table 2. Barthes' Semiotic Analysis of Hypertrophy Introduction

Barthes' Element	Analysis
Denotation	A scientific explanation of hypertrophy as muscle growth through resistance training.
Connotation	Cultural attraction to a muscular body as an aesthetic ideal, shifting gender norms on appearance.
Myth	A muscular body represents modern ideals of success, health, and social value for all genders.

Applying Barthes' theory at this level, each sign picks up cultural, emotional, and ideological connections that go beyond its exact meaning. This turns out to mean that muscle development has strong appeal and is important in society, clearly beyond just its basic functioning in the body. When youth, young men, and women are mentioned together, it shows that cultures are rethinking how men and women are supposed to look, especially as women now claim stakes in what society considers manly. As explained in [12], stereotypes related to manliness or masculinity include a muscular male body and a sturdy physique. As a result, the implied meanings reflect what a culture values, fears, and hopes about physical looks, age, and gender.

According to Barthes, the concept of myth means that these connotations enter the public mind as simple stories or beliefs. The concept of myth is a form of speech that transcends mere language, including visual and symbolic representations. By dissecting these myths, Barthes reveals how they serve to depoliticize reality, presenting a simplified version of complex social dynamics [13]. Many podcasts contribute to inventing myths about the perfect body and scientific development. Hypertrophy discussions are organized around the "myth" that a certain body type is ideal, making

muscle growth about meeting our personal, social, and cultural standards. Just like biospheric narrative, ads linking science with appearances depict the advance of knowledge as leading naturally to better bodies and greater health benefits.

B. Hypertrophy Mechanisms

Similarly, Dr. Galpin's detailed account of molecular signaling cascades "activation of something on the cell wall... induces that signaling cascade... initiates protein synthesis." Describes concepts using scientific terms to anchor the discussion in real, biological facts. The podcast is more believable because it uses precise scientific terms for its explanations about muscle hypertrophy. The analysis of this segment can be broken down in the following table:

Table 3. Barthes' Semiotic Analysis of Hypertrophy Mechanisms

Barthes' Element	Analysis
Denotation	Detailed scientific explanation of cellular signaling pathways and protein synthesis in hypertrophy.
Connotation	The use of complex terminology emphasizes authority, objectivity, and rationality in discussing the body.
Myth	The body is viewed as a machine governed by biochemical laws; science is portrayed as the ultimate truth, reinforcing modern ideals of control.

However, according to Barthes, the meaning found in signs is flexible and can change. In terms of connotation, signs add more meaning because of the culture, social situation, and ideologies involved. As [14] stated that Barthes applied myth to construct a "second order system" in which the sign of the first order system becomes the signifier of another sign; simply put, there is always another meaning in a sign (spoken or otherwise). They trigger emotions, important value systems, and social codes in ways that go beyond the text or message. What at first seems like standard science talk in the podcast is influenced by the wider opinions people hold toward the body, gender, and scientific knowledge.

On the other hand, with the term "occupies the minds," hypertrophy is shown to be such a big cultural idea that many people have trouble stopping their obsession over it. It suggests that having muscles is not only a biological change, but also an important feature in modern body culture, where how you look and strong muscles are tied to your sense of who you are, your social position and how others see you. As found in [15] research that the more individuals internalize society's ideals about appearance, the more they compare their physical appearance to others, and thus the greater the BD (Body Dissatisfaction) they feel.

Another dialogue, "young men, but also a lot of women." has a strong meaning related to gender changes. Gym culture was known for promoting the idea that strength and resistance training are traits mostly connected to masculinity [16]. This section shows that the dialogue is changing to support women in hypertrophy training, challenging the usual divisions between genders. With this change, narratives about femininity and empowerment are expanding, as muscular strength gives women a way to decide for themselves and challenges traditional ideas of what a woman's body means.

C. Hypertrophy Mechanisms

These meanings, found in our everyday language, show how scientific talk on building muscle affects discussions about gender and the body. When the speakers use these terms, they take part in popular discussion about who should be included in places traditionally viewed as only for men and, as a result, show how social change happens. Talking about things like "dogma," "signaling cascade," and "protein synthesis" moves Galpin's words past explaining science; they also represent his skill and knowledge, indicating to the audience that what he says is authoritative. Terms such as 'science,' 'concern,' and 'problem' connect science with an air of cultural privilege and command trust from the public. Such expressions support a discussion where science is demonstrated to be accurate, proven, and above question. The semiotic elements of this excerpt are presented in the following table:

Table 4. Barthes' Semiotic Analysis of Training Approaches

Barthes' Element	Analysis
Denotation	Descriptions of training frequency, signal intensity, and programming approaches for muscle growth.
Connotation	Muscle development is framed as a calculated system, reinforcing values of discipline, optimization, and efficiency.
Myth	The body is a programmable system; those who follow rational strategies deserve physical transformation and social admiration.

In addition, the way mechanics is described gives the view that the human body can be simplified as a machine, controlled by specific chemical laws. By doing so, this encourages the audience to notice and value facts that can be counted and checked again, rather than personal knowledge. Using this approach matches with modernism, leading to the idea that the body should be shaped, improved, and managed according to rational guidelines. In Barthes' myth level, Connotation builds upon an already existing system of significance, denotation is the common sense, and those two are made into larger ideological messages that appear normal or correct [17]. In this sense, myths help to make usual cultural and social beliefs seem inescapable and unchanged by history.

A defining myth featured in the podcast is that only a certain body shape is suitable, as mentioned by [18] that the body is a project that projects one's self. Because of this myth, hypertrophy represents things like discipline, attractiveness, and social prestige, giving it more value than it really has. The podcast explains hypertrophy not only as a physical change that happens, but also as a target for personal development and how people see themselves. This ties in with current Western beliefs that modifying the body shows a person takes responsibility, is successful, and belongs in society.

By spreading the idea of an ideal body, society also helps strengthen traditional ideas about how we should appear and be fit, all while arguing that gaining control over our bodies is necessary for us to fit in. Bodybuilding tends to teach people that having muscle means having strong willpower, determination, and control, while those without muscle may appear weak in these areas. It would point out that, by appearing to be an obvious truth, the myth allows cultural standards to support those with certain body shapes, ways of presenting their gender, and lifestyles. By using science in its talks, the podcast takes part in promoting this myth, which helps the broader fitness industry shape our views on identity.

A further myth explored in the podcast is that women joining hypertrophy workouts signals cultural progress toward more gender equality. According to Barthes, the myth disguises the fact that there are ongoing differences between men's and women's chances of accessing athletic fields. Barthes examines in his work "Mythologies" how common cultural forms maintain myths. Myths, he points out, can trick people into believing that certain social matters are fixed by making them appear effortlessly accepted [19]. As a result, myths help further inequality between genders, even when it comes to sports. In short, the idea that women are getting stronger seems to come across as if nothing were standing in their way. Even so, this belief does not show how social and cultural structures such as patriarchy still contribute to inequality between genders. Barthes shows us how these discussions fail to examine the main reasons for these inequalities.

D. Breaking Down Muscle Growth Pathways

The podcast is, however, structured so that scientific discourse is considered the ultimate authority and deserves unchallenged respect. When Dr. Galpin calls the belief in the necessity of muscle breakdown for growth a "lie" that has spread by "word of mouth," it acts as an example of how new science says older ideas are wrong. For Barthes, myth helps to make dominant views accepted as true, even while pushing aside alternative views that reject common scientific ways. As such, the myth helps make sure scientific explanations are accepted above others and keeps scientific knowledge dominant. The table below outlines the semiotic structure of this segment:

Table 5. Barthes' Semiotic Analysis of Breaking Down Muscle Growth Pathways

Barthes' Element	Analysis
Denotation	Explanation of multiple hypertrophy methods: blood flow restriction, metabolic disturbance, and mechanical tension.
Connotation	The human body is portrayed as adaptable and manageable through various scientific techniques, suggesting mastery through knowledge.
Myth	Scientific innovation offers equal access to muscle growth; the body is a site for experimentation and optimization through advanced methods.

It is also clear from the book that people see their body much like a computer that can be tweaked. Thanks to Barthes' viewpoint, we realize that biological and training terms turn the human body into a system designed to be optimized and regulated. It illustrates wider beliefs in the society that mastering technology, optimization, and efficiency are the highest values. According to this narrative, the body becomes a thing that can be controlled, adjusted, and improved with science and technology. As a result, the myth shows the human subject taking charge of their body, just as a complex machine, and supports modern expectations of progress and order.

E. Muscle Breakdown Discussion

The final example is summarized below:

Table 6. Barthes' Semiotic Analysis of Muscle Breakdown Discussion

Barthes' Element	Analysis
Denotation	Clarification that muscle breakdown is not necessary for hypertrophy; multiple mechanisms can stimulate growth.
Connotation	Challenges fitness myths by privileging updated scientific discourse; reinforces the authority of research over tradition or popular belief.
Myth	New science replaces outdated dogmas; rational training guided by experts is the only valid path to bodily improvement and empowerment.

By discussing fitness myths and using updated science, these speakers once again promote the authority of science. In Mythologies [19], Barthes explained that myths hide the true nature of social issues and now science replaces old ideas with new ideas that seem neutral. Such a speech is connected to technocratic ideologies, since it gives science top priority over folklore and body-based knowledge.

IV. Conclusion

According to Roland Barthes' theory, the "How to Build Muscle" episode uses scientific information about hypertrophy in ways that mean more than words on the surface. The conversation at this level focuses on thoroughly explaining how muscles grow and how training should be conducted. At the same time, when the words are considered more fully, new meanings appear that reveal how society's views of looks, gender, and medical knowledge develop. More importantly, podcast discourse helps establish and build on strong cultural myths. Such myths as the perfect body, genders coming together, our bodies as machines, and trusting and learning from science allow today's notions about staying fit, identity, and health to appear reasonable and expected. By using his approach, these subtle ideas that guide scientific communication are more easily found. The research demonstrates how science narratives in podcasts contribute to shaping public perceptions of the body and science. Fact and myth in bodybuilding tell listeners not only about hypertrophy but also touch on larger themes about becoming better, powerful, and technologically skilled. This research could be put to further use by looking at how people offer different interpretations of these myths or try to resist the ideas being portrayed. Knowing about these semiotic processes helps you closely analyze fitness culture and the science behind it.

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