The Impact of Advertisement Type and Health Claims on Consumers' Perceived Accuracy and Purchase Intentions of Dietary Supplements

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Technology Statement

1. Did you use any tools or services to paraphrase text from other sources (for example, a thesaurus or the Academic Phrasebank)? Yes, QuillBot.
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Abstract

The use of dietary supplements (DS) is on the rise, with a growing number of people making use of these products. Despite societal beliefs in their efficacy, clinical evidence supporting the positive health impacts of DS remains scarce, with potential health risks associated with excessive consumption. Therefore, it is crucial that information about DS provided in marketing sets accurate expectations. Marketing strategies for DS vary, including brand advertisements and influencer advertisements, often accompanied by claims implying a beneficial relationship between the product and health. These claims are either scientific, containing a science-based causality, or soft, containing personal experiences or opinions. This study investigates the effects of type of advertisement (brand advertisement or influencer advertisement) and type of health claim (soft claim or scientific claim) in DS marketing on perceived accuracy (perceived scientific accuracy and perceived personal accuracy) and purchase intentions. Utilizing a 2x2 between-subjects design in an online survey experiment, 120 participants were randomly exposed to social media posts representing different combinations of advertisement and claim types. The results revealed that type of advertisement does not affect perceived accuracy, but that brand advertisements significantly increase purchase intentions compared to influencer advertisements, contrary to initial hypotheses. Moreover, scientific claims lead to a higher perceived scientific accuracy than soft claims, yet soft claims elicit higher purchase intentions. This study underscores the complex interplay between advertisement type and health claims in the DS market, highlighting the need for further research to inform the impact of influencer marketing strategies and consumer health education.

Contents

1. Introduction

The use of dietary supplements (DS) is witnessing a notable increase, marked by a growing number of individuals turning to these products (Intarakamhang & Prasittichok, 2022; Thakkar et al., 2020). DS serve as additives to one's daily diet, comprising a range of ingredients, including vitamins, minerals, herbs, and other compounds (Lam et al., 2022). Package labels of DS contain so-called "health claims", which are assertions that imply a positive relationship between a (component of a) food product, such as DS, and health (NVWA & Lugt Food Law, 2021).

Despite widespread belief in the effectiveness of health claims, and of DS in general (Homer & Mukherjee, 2019; Karbownik et al., 2021), there is often little clinical evidence to support their use (Hannon et al., 2020; Maughan et al., 2018). Many dietary supplements thus have misleading health claims, which poses a risk to public health. When individuals inaccurately perceive the health claims on the label of a DS, they might, for example, consume DS with the wrong nutrients, leading to potential vitamin surpluses. This is compounded by the fact that some DS exceed recommended daily dosages (Biesterbos et al., 2019; White, 2020). The excessive use of DS presents considerable health risks, as highlighted by research (Or et al., 2019). These risks include the potential for liver damage and cardiac issues (Or et al., 2019). Such concerns have raised alarms within the healthcare field (Or et al., 2019), underscoring the urgent need for improved regulation and enhanced consumer awareness in the use of dietary supplements.

Potentially misleading health claims are an important part of the marketing promotion of DS. There are at least two ways in which DS health claims are used: in social media advertisements by the brand itself, and in influencer advertisements (Klein & Schweikart, 2022). Both these strategies nurture consumer awareness about preventive healthcare, providing them with health and lifestyle-related information and product recommendations (Lam et al., 2022). The first marketing strategy, branded social media advertisements, is a type of social media marketing (SMM). SMM refers to the strategic use of social media tools and platforms to create and share marketing content (Ebrahim, 2019). SMM aims to capture the attention and engagement of consumers across different dimensions, including entertainment, interaction, trendiness, personalization, and word-of-mouth (Ebrahim, 2019).

There are many ways a brand can be presented via SMM. One of which is through its own channels using their brand identity and creating branded social media advertisements (Voorveld, 2019). For instance, a DS brand could showcase one of its products through an Instagram post, presenting a visually appealing image. In this post, the brand might pair the product photo with a compelling text, making a claim about the beneficial health effects of the supplement when consumed. These claims are typically scientific by nature, since the brands are obligated to adhere to health claim regulations established by the European Food Safety Authority (EFSA) (NVWA & Lugt Food Law, 2021). Therefore, scientific claims can be characterized by their description of a scientific proven causality between (a component of) DS and consumers' health.

The second marketing strategy, influencer marketing, has emerged as a pivotal strategy in contemporary marketing, involving brands investing in influencers for the creation and dissemination of their branded content (Lou & Yuan, 2019). Social media influencers disseminate personal content that reflects their lifestyle and interests, including personal opinions (Tafesse & Wood, 2021). This distinguishes influencer content from

traditional social media advertisements by brands, particularly in the DS industry, where brands typically focus on sharing factual science-based health information instead of soft information about personal experiences with the product. For example, influencers could share a personal quote such as “Because I take melatonin, I wake up feeling rested in the morning.”, while the science-based health claim should state that “Melatonin contributes to the reduction of the time needed to fall asleep (when consuming 1 mg of melatonin shortly before bedtime).” (Keuringsraad, n.d.). This shows the difference between a ‘hard’ scientific claim compared to a non-scientific, soft claim (Aschemann-Witzel & Grunert, 2015).

Extensive health-related research has been conducted on the health risks associated with DS use (Or et al., 2019), and the influence of inadequate understanding of health claims on inappropriate DS substitution (Thakkar et al., 2020). Furthermore, marketing-related research has been conducted on the role of influencers in DS product marketing (Klein & Schweikart, 2022). Particularly, Klein and Schweikart (2022) describe influencers as being negligent when representing health claims, advising more regulation or consequences when not adhering to them, which would be beneficial for consumers. Additionally, Lou and Yuan (2019) describe the value of influencer content and source credibility, as having an effect on trust of followers, which in turn improves brand awareness and consumer purchase intentions.

However, despite the previous research, it remains an open question how personal claims about DS products made by influencers are perceived by consumers, particularly in terms of whether it is accurately perceived that the influencer's statements may constitute soft claims rather than factual, scientific information. Additionally, the question is if influencer personal claims impact purchase intention. Therefore, this study poses the following research question: What are the effects of type of advertisement (brand advertisement or influencer advertisement) and type of health claim (soft or scientific) in DS marketing on consumers’ perceived accuracy of health claims and purchase intentions?

2. Theoretical Framework

2.1 Advertising for Dietary Supplements

A growing number of individuals are making use of dietary supplements (DS) (Intarakamhang & Prasittichok, 2022; Thakkar et al., 2020). DS are substances that contain various vitamins, minerals and herbs and are taken in by consumers to improve well-being and long-term health (Lam et al., 2022). The rise of DS usage can be explained partially by the increase in consumer awareness in the field of preventive healthcare, which is a consequence of growing digital media presence (Lam et al., 2022). Within preventive health care, various types of digital media are used to increase consumer awareness, such as televised advertising, scientific news and advertising on popular websites (Lam et al., 2022). DS promotion on social media is carried out primarily through two strategies: brands publishing social media advertisements, and influencers providing endorsements for the product (Klein & Schweikart, 2022).

The first strategy for online DS promotion is that brands utilize branded social media advertisements on their own channels via Social Media Marketing (SMM) (Voorveld, 2019). SMM involves the strategic use of social media tools and platforms to create and share marketing content (Ebrahim, 2019). Its objective is to capture consumer attention and engagement through various dimensions like entertainment, interaction, trendiness, personalization, and word-of-mouth (Ebrahim, 2019). Typically, DS promotion contains advertisements that prominently display a DS product image alongside text, frequently containing health claims aimed at explaining the product's health benefits (NVWA & Lugt Food Law, 2021). These texts tend to be factual, as brands marketing DS must adhere to regulations governing the formulation and causality of these claims (NVWA & Lugt Food Law, 2021).

Branded social media advertisements can be used to strengthen the online engagement and intensify the brand awareness of consumers, which may result in an increased purchase intention (Dabbous & Barakat, 2020). Research by Dabbous and Barakat (2020) found that these effects are more present when the published content is regarded to be of high-quality by the consumer. High-quality content triggers a hedonic motive among users, characterized by the enjoyment and entertainment derived from social media interactions (Dabbous & Barakat, 2020). According to Dabbous and Barakat (2020), this heightened hedonic motivation fosters deeper engagement with the brand's content, ultimately elevating the likelihood of purchase intentions.

Another way for DS products to be marketed is via influencer advertisements. Social media influencers can be characterized as online personalities who typically publish about their interests and share their personal opinions regarding topics and products that are part of their lifestyle (Tafesse & Wood, 2021). Brands can use influencer advertisements for the marketing of their product. In doing so, the influencers share their personal experience of the product with their followers. Social media influencers date back to the rise of the Internet in the late 1990s, and examples of influencers making a living of their online presence can be dated to the early 2000s (Burns, 2021). Influencers can be seen as opinion leaders in a more traditional sense, often being followed by fans for their superior status, social prestige, personal appeal or expertise (Vrontis et al., 2021). According to Campbell and Farrell (2020), influencers can be categorized by means of their size, ranging from nano-influencers (0-10,000 followers) up to celebrity/mega-influencers (>1 million followers). The

larger an influencer grows, the greater their perceived expertise and cultural capital becomes, at the cost of a lower accessibility and authenticity (Campbell & Farrell, 2020).

For marketing purposes, the utilization of influencers offers numerous advantages. Firstly, targeting a consumer segment via influencer advertisements is effective due to the expected homogeneity of the influencer's audience (Leung et al., 2022). Secondly, making use of influencer endorsements allows a brand to enjoy the benefits of the influencer's distinct positioning within the market, causing a higher market acceptance for the product (Leung et al., 2022). Thirdly, influencers are often allowed to freely create their original and creative advertisements, usually accompanied by certain brand identity features such as colors or slogans (Leung et al., 2022). Finally, the use of influencer marketing makes brands able to benefit from the perceived authenticity and communal relationship an influencer might have with their followers (Leung et al., 2022). These benefits collectively contribute to the heightened effectiveness of marketing communication.

In line with Leung et al. (2022), also Lou and Yuan (2019) emphasize the important role of trust in influencer marketing: the influencer's trustworthiness, attractiveness, and similarity to followers positively impacts the followers' trust in influencers' branded post. This trust, in turn, significantly influences both brand awareness and purchase intentions among the audience. Additionally, Ao et al. (2023) also found that an influencer's trustworthiness has a positive impact on followers' purchase intention.

The impact of followers' trust in an influencer on their purchase intention might be better understood through the phenomenon parasocial relationships. Parasocial relationships refer to the sense of connection followers feel with celebrities, often perceiving them as friends or intimate acquaintances (Yang et al., 2022). Ao et al. (2023) highlights that trust plays a crucial role in relationships, serving as a factor in predicting and evaluating the value of future interactions between individuals. Therefore, when an influencer shares opinions or promotes products that resonate with a follower's beliefs, their trustworthiness tends to increase. Notably, research conducted by Yuan and Lou (2020) has shown that consumers who develop parasocial relationships with influencers demonstrate a heightened interest in products endorsed by those influencers. On the contrary, when a consumer has a negative experience with either a brand or influencer, a phenomenon called brand betrayal or influencer betrayal can occur (Reinikainen et al., 2021). Brand or influencer betrayal can be defined as negative feelings a consumer experiences when a brand or influencer fails the expectations of a consumer, for example due to a violation of the consumers' morals. This betrayal could have negative impact on the credibility of a brand or influencer (Reinikainen et al., 2021), which can cause a decline in purchase intention according to Ao et al. (2023).

All in all, the collective evidence sketched above suggests that influencer-generated posts may exert a distinct influence on consumers compared to posts directly from the brand, underlining the unique and multifaceted impact of influencer marketing on consumer behavior. For the specific case of DS advertisements, this difference can specifically be attributed to the types of claims typically made in each type of advertisement.

2.2 Claims Regarding Dietary Supplements

In general, advertisements for DS products contain health claims, which can be defined as claims that suggest a beneficial relationship between the DS product and health (NVWA & Lugt Food Law, 2021). However, for many of these claims, there is no clinical evidence (Hannon et al., 2020; Maughan et al., 2018). The current research discusses two types of health claims that are used in the marketing promotion of DS, namely scientific

claims and soft claims. The type of claim used often differs based on the type of advertisement (brand advertisement vs. influencer advertisement).

The first type of claims, scientific claims, are mostly used by branded social media advertisements. While defining scientific claims, brands are obligated to adhere to health claim regulations established by the European Food Safety Authority (EFSA) (NVWA & Lugt Food Law, 2021). The EFSA regulations determine all science-based assumptions that are allowed to be made about the effects of DS ingredients (e.g., vitamins) on health (e.g., lowering blood cholesterol). Thus, scientific claims contain factual science-based information.

What makes a claim factual and science-based is a scientifically proven causality between the mentioned ingredient in the claim and the effect it has on the consumer's health. A compliant claim such as "Vitamin D contributes to a normally functioning immune system" would not be allowed, if there was no scientific evidence for this causality. If phrased differently, the claim could also be in violation of regulations, for example "Vitamin D contributes to the immune system". This claim might be true for consumers with a normally functioning immune system, but leaving the words "normally functioning" out, causes the claim to be in violation, because it could create expectations for people with a weakened immune system, which have not been scientifically proven. Consequently, due to the necessity of demonstrating a causal relationship between dietary supplements and health outcomes, the complexity of terminology in scientific claims often increases. Understanding this terminology requires a higher level of literacy to perceive its meaning accurately.

The second type of claims, soft claims, are more likely to be found in influencer advertisements. Soft claims, as defined by Aschemann-Witzel and Grunert (2015), refer to the phenomenon where personal experiences might possibly be perceived as facts. Influencers can be characterized for sharing personal information and opinions about their lifestyle and interests via social media (Tafesse & Wood, 2021). As a result, influencers, who are accustomed to sharing their opinions and personal experiences, include these experiences in advertisements when promoting a DS product for a DS brand. Unlike scientific claims that are bound by stringent rules and regulations, influencers are allowed the freedom to make soft claims, expressing personal experiences on social media platforms. Since the DS brand uses the influencer to promote their DS product, it might give the impression that the influencer's personal experience (e.g., "After using product X, I felt much more rested when waking up than I normally do") is a result of using the DS. Moreover, influencers' use of soft claims often results in less complex use of terminology and therefore requires a lower level of literacy, compared to scientific claims.

It is the question how different types of claims in different types of marketing are processed, and what effects they may have on consumers. The current study distinguishes between two types of effects: perceived accuracy, and purchase intention.

2.3 Effects on Perceived Accuracy

In the current research, perceived accuracy is defined as an individual's subjective belief or confidence regarding their understanding of the factual meaning of a DS health claim. It particularly pertains to perceived causality, such as the connection between a DS and a health condition. Therefore, perceived accuracy reflects to which extent an individual believes they have grasped the intended meaning or relationship presented. For example,

when a consumer thinks they read a scientifically proven claim after being exposed to a soft claim, the perceived accuracy would be low, or vice versa.

When it comes to perceived accuracy of health claims about DS products, it could be argued that the factual scientific claims in brand advertisements most likely lead to a higher perceived accuracy of the health claim than the experience-based soft claims in influencers advertisements. It might be expected that a more explicitly expressed causal relation in a scientific claim would help the consumer accurately perceive the facts behind the claim.

However, it is important to note that scientific claims often employ a more complex terminology compared to soft claims. Consider vitamin B12, a compound found in certain DS, where EFSA-permitted health claims explain the positive effect of vitamin B12 on a normal 'energy metabolism' (Keuringsraad, n.d.). In contrast, a soft claim might simplify this effect as 'having more energy.' The term 'energy metabolism' demands a higher level of literacy and may prove more challenging to comprehend compared to the simpler language used in a soft claim. This difference underscores potential obstacles in accurately perceiving the effects of DS when presented through a scientific claim rather than a soft claim.

Soft claims could be expected to have a high perceived accuracy, in this case due to the influencer often being trusted by the consumer (Leung et al., 2022). The consumer might inaccurately perceive the soft claim as being correct and science-based, partially due to their (parasocial) relationship with the influencer. Additionally, soft claims often contain personal information, which makes them prone to inaccuracies. Within the field of health, inaccurate information is labeled as health misinformation (Suárez-Lledó & Álvarez-Gálvez, 2021).

Both soft and scientific claims contain aspects causing them to possibly be perceived as accurate or not, however it is expected that scientific claims might lead to a higher consumers' perceived accuracy, due to their actual accuracy also being higher.

Due to the natural connection between perceived accuracy and the claims (which convey the information to be perceived), it could be expected that perceived accuracy is mainly affected by type of claim. This is because perceived accuracy as a variable represents the level at which participants claim to have understood the message they read. However, there might also be a possible effect caused by the type of advertisement. Research does show that expertise, trustworthiness, and credibility of the source can affect a person's attitude towards information and make them more likely to agree with the message (Reichelt et al., 2014). This in turn could cause participants exposed to a brand advertisement to exhibit higher perceived accuracy than those exposed to an influencer advertisement, due to the brand's inherent expertise on their own product.

In summary, the level of perceived accuracy of DS might be related to the distinction between scientific and soft claims. Scientific claims may pose comprehension challenges due to their complex terminology. However, the factual information on which scientific claims are based makes them very likely to accurately explain the effects of dietary supplements on health, which also causes them to be perceived as more credible (Kuutila et al., 2024). In contrast, soft claims contain personal information which make them more prone to inaccuracy and may thus include health misinformation. Additionally, brands that use advertisements can be seen as an expert on their own product, which could affect perceived accuracy among participants. Finally, the combination of a brand advertisement with a scientific claim is expected to have the greatest impact on perceived accuracy, because it leverages both the credibility of the brand and the factual basis of scientific claims, thus enhancing trustworthiness and perceived accuracy in the eyes of consumers.

2.4 Effects on Purchase Intention

When marketing DS, advertisements do not only have influence on perceived accuracy, but also on consumers' purchase intention. In order to explore possible effects of type of advertisement and type of claim on purchase behavior, this study will measure purchase intention and use it as an indicator of purchase behavior. Purchase intention can be defined as a consumer's intent to purchase a product, which has shown to have a direct positive correlation with actual buying rates (Akkaya, 2021).

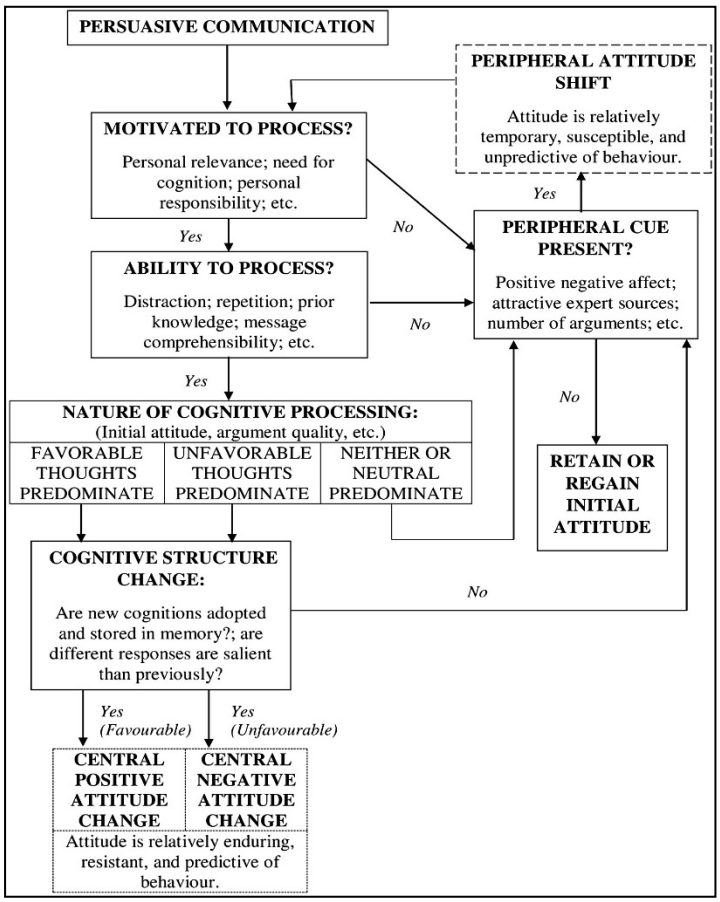
When considering the purchase intention associated with the types of advertisements for DS, it could be argued that influencer advertisements would show a higher purchase intention than brand advertisements. Research indicates that consumers' trust in influencers positively impacts the purchase intention of followers (Ao et al., 2023; Lou & Yuan, 2019). This trust originates from the perceived authenticity and personal connection between the influencer and their followers (Leung et al., 2022). These connections could be perceived as friendships but are actually one-sided parasocial relationships (Yang et al., 2022). Consequently, followers who have developed a parasocial relationship with the influencer exhibit heightened interest in the products endorsed by the influencer, potentially resulting in a higher purchase intention. According to Dam (2020), brands may earn some trust from loyal consumers increasing purchase intentions. However, the trust formed in (parasocial) relationships between individuals might be stronger and therefore more effective in influencing consumers' purchase intention. Moreover, an important advantage of influencer marketing is the ability to accurately target specific consumer segments by leveraging specific influencers whose audience already possesses a preexisting interest in the promoted product (Leung et al., 2022).

In order to explain a possible causality between type of claim and purchase intention, the Elaboration Likelihood Model (ELM) can be of use. The ELM describes how individuals process information by distinguishing two types of processing (Petty & Cacioppo, 1986). The first type, central processing, involves deep and thoughtful evaluation of messages. The second type, peripheral processing, involves superficial and heuristic-based evaluation of messages. Globally, the ELM can be used to gain insights into how individuals process information and is especially useful for understanding persuasion and attitude change (Petty & Cacioppo, 1986).

A schematic view of the ELM can be found in Figure 1. In the model, various routes are shown which perceived communications can take. Key factors are a consumer's motivation to process communication, their ability to comprehend the message and their preconceived notions regarding the message. When a consumer is not motivated to process the message they are receiving, the next step in the model checks for the presence of a peripheral cue. If there is no peripheral cue, and no motivation, the message will most likely not influence the consumer and cause them to retain or regain their initial attitude. If there is a peripheral cue, this cue might cause a shift in the consumer's attitude and thus motivate them to process the information, unless they do not have the ability to do so. When a consumer does have the motivation and ability to process the message, their cognitive change is based on their attitude towards the message. If their initial thoughts (based on current attitude, but also quality of the message) are predominately (un)favorable, the message is more likely to cause a (un)favorable attitude change. If the consumer's initial thoughts are neither favorable nor unfavorable, a peripheral cue could be present to create a shift in thought, to then cause the consumer to undergo a positive or negative change of attitude (Shahab et al., 2021).

Figure 1

Elaboration Likelihood Model (Shahab et al., 2021).



In the current research, the two types of claims could be seen in light of the two processing routes described in the ELM. Arguably, scientific claims are more likely to be processed via the central route, given their factual nature. These claims often require more motivation and ability to process and are less likely to contain peripheral cues. On the other hand, soft claims are likely to be processed via the peripheral route, since these claims typically rely more on peripheral cues such as personal experiences or previous influencer-consumer relationships in order to sway a person's emotions and attitudes.

In the context of social media usage, consumers commonly engage in lower elaboration when using platforms like Instagram. Messages on these platforms typically rely on peripheral cues to grasp attention and motivate the consumer to process the message. Consumers tend to use social media as a leisure activity during breaks in their daily routines (Kırcaburun et al., 2018). As stated by Lee and Theokary (2021), the state of lower elaboration is favorable for peripheral route processing. Although in lower elaboration, advertisements containing soft claims are more likely to be effectively processed by consumers compared to those with scientific claims.

Additionally, when in this state of lower elaboration, the importance of peripheral cues should be emphasized, as consumers are more likely to use peripheral route processing. Peripheral cues come in many ways, one of which could be "expert sources". This could explain a possible effect of type of advertisement on purchase intention, as brands can be considered an expert on their own products. Furthermore, increased

processing of an advertisement leads to a higher trustworthiness, which in turn leads to a higher rate of purchase intention (Vrontis et al., 2021).

In conclusion, the level of purchase intention for DS products might be influenced by several factors. Firstly, the type of advertisement may play a role due to differences in consumer trust formation between brand and influencer advertisements. The development of a parasocial relationship between influencers and followers could foster a stronger bond of trust compared to traditional brand-consumer relationships, impacting purchase intention. Secondly, the type of claim might affect purchase intention through differing levels of processing on social media platforms. As consumers often engage with social media for leisure, soft claims are more likely to being processed effectively through peripheral routes, unlike scientific claims which may demand deeper cognitive engagement. Given that a message or claim needs to be processed to change an attitude, soft claims are expected to have a higher chance to have an impact on the purchase intention, than scientific claims. Lastly, the combination of an influencer advertisement with a soft claim is anticipated to demonstrate the most significant influence on purchase intention. This expectation is grounded in the trust consumers place in influencers and the expected advantages of peripheral message processing, which collectively contribute to their persuasive impact.

2.5 Hypotheses

Based on the theory discussed above, hypotheses can be formulated by the anticipated impacts of the different type of advertisements and type of claims on both the perceived accuracy and purchase intention:

H1a: Consumers' perceived accuracy of DS health claims is expected to be significantly higher for brand advertisements compared to influencer advertisements.

H1b: Consumers' perceived accuracy of DS health claims is anticipated to be significantly higher for scientific claims than for soft claims.

H1c: The combined influence of advertiser type and formulation of health claim is hypothesized to have the greatest impact on consumers' perceived accuracy of DS when influenced by brand advertisements with scientific claims.

H2a: Consumers' purchase intentions are expected to be significantly higher for influencer advertisements compared to brand advertisements.

H2b: Consumers' purchase intentions are expected to be higher for soft DS health claims than for scientific DS health claims.

H2c: The combined influence of advertiser type and formulation of health claim is hypothesized to have the greatest impact on consumers' purchase intentions when influenced by influencers advertisements with soft claims.

3. Methods

3.1 Design

For this study, an online survey experiment with a 2 x 2 between-subjects design was conducted. The independent variables were type of advertisement (two levels: brand advertisement vs. influencer advertisement), and type of claim (two levels: scientific claim vs. soft claim). The dependent variables were consumers' purchase intentions and consumers' perceived accuracy of DS heath claims. The control variables included social media usage and influenced purchase behavior. These control variables were considered to mitigate any potential confounding effects on the dependent variables.

3.2 Participants

In this study, 120 individuals participated, with 30 participants assigned to each experimental group. The majority of the sample was female, accounting for 65.8% (n = 79), followed by males at 33.3% (n = 40). One participant identified as non-binary, constituting 0.8% of the total sample. Participants' ages ranged from 18 to 64 years old. The largest proportion fell within the age bracket of 18 to 24 years old, representing 41.7% (n = 50), followed closely by the age group of 25 to 34 years old at 39.2% (n = 47). Other age groups were distributed as follows: 35 to 44 years old (7.5%, n = 9), 45 to 54 years old (8.3%, n = 10), and 55 to 64 years old (3.3%, n = 4).

Participants' educational background was categorized into three levels: high (hbo, wo), medium (havo/vwo, mbo), and low (vmbo). The majority of participants, accounting for 83.4% (n = 100), had followed a high level of education, while 14.1% (n = 17) reported a medium level, and 0.8% (n = 1) reported a low level of education. Additionally, two participants (1.7%) opted not to disclose their educational background. In terms of social media usage, most participants, 94.2% (n = 113), indicated that they used social media, while 5.8% (n = 7) reported that they did not. Furthermore, 65.8% (n = 79) of the participants indicated that they had made a purchase based on a message on social media, while 34.2% (n = 41) reported that they had not.

3.3 Materials

The materials for the study consisted of three Instagram posts promoting DS products, which were all manipulated in four conditions. The platform Instagram was chosen since it accommodates both branded social media advertisements and influencer advertisements (Haenlein et al., 2020). The Instagram posts contained several elements that were manipulated for each stimulus, including: The DS product picture, the caption (textual claim), and the profile picture and name. The specific DS products selected for this manipulation were carefully chosen based on a comprehensive selection procedure detailed later in this chapter, ensuring that the chosen stimuli aligned with the research objectives and criteria.

To improve generalizability regarding specific advertisers, claims, or DS products on participants' purchase intention and perceived accuracy of health claims, each participant was exposed to three instances of the same experimental condition. For example, if assigned to the condition featuring an influencer advertisement with a soft claim, participants viewed three distinct advertisements, each presented by a different influencer, making diverse soft claims about various DS products. In the creation for the stimulus materials, three different sets of the four experimental conditions were made.

The first independent variable, type of advertisement, representing either an influencer or a brand advertisement, was manipulated by altering the profile picture and name, as well as the DS product picture. Photos for both the profile picture and DS product picture were sourced from the official Instagram accounts of brands and influencers. The brand advertisement variant (Figure 2), featured a photo with the DS product as the central focus against a neutral background, mirroring the brand's official Instagram account. In contrast, the influencer variant (Figure 3) showcased both the influencer and the DS product, creating a distinct difference in DS product presentation compared to brand advertisements.

Figure 2

Example of a Brand Advertisement

Figure 3

Example of an Influencer Advertisement

The criteria for selecting DS products were based on the content published by these entities on Instagram. The initial step involved identifying DS brands that utilized both brand advertisements and influencer partnerships on Instagram to promote their products. The selected brands—Vitakruid, Yummy Gums, and JS Health—were chosen based on this criterion. Subsequently, a thorough examination of published posts on the official Instagram accounts of these brands was conducted. Emphasis was placed on identifying photos featuring the DS product as the central focus against a neutral background, as described in the previous paragraph. For each selected brand, a collection of published posts meeting the established criteria was compiled. Next, the tagged posts option on the brands' Instagram profiles was utilized to identify influencer posts endorsing the selected DS products. The selection process prioritized images where influencers posed with the chosen DS products. Ultimately, “SilSolutions” from Vitakruid, “Sunny D3 Gummies” from Yummy Gums, and “Hair + Energy” from JS Health were identified as the chosen products. The influencers endorsing these products included Rianne Atiya (@rianne.meijer), Britt Wijnne (@brittwijnne), and Marianne Mota (@mariannemota__). Based on the influencer categories described by Campbell and Farrell (2020), each influencer was assigned based on their follower size. Rianne Meijer was categorized as a mega-influencer with 1.5 million followers, Marianne Mota as a micro-influencer with 21,200 followers, and Britt Wijnne as a nano-influencer with 9,900 followers (Atiya, n.d.; Mota, n.d.; Wijnne, n.d.).

The second independent variable, type of claim, distinguishing scientific and soft claims, was manipulated by modifying the caption of the Instagram post. An Instagram

caption is the textual description that accompanies the photo in an Instagram post. To generate captions for the selected stimulus materials, the researcher crafted new captions, ensuring alignment with the research objectives and criteria for stimuli selection. All captions were written in Dutch, since the dissemination of the questionnaire took place among Dutch consumers. When formulating captions containing scientific claims, particular attention was given to compliance with EFSA regulations (NVWA & Lugt Food Law, 2021). As explained in the theoretical framework, brands marketing dietary supplement products are required to adhere to these regulations, which dictate that health claims must be supported by scientific evidence. The EFSA regulations serve as a framework, permitting only science-based assertions regarding the proven and factual positive relationship between a (component of a) DS product and health.

To guarantee the accuracy and legitimacy of the claims, the researcher consulted the "claims database" from Keuringsraad (n.d.). This Dutch database contains scientifically proven health claims that comply with EFSA regulations and are permitted for use by brands marketing DS products. Additionally, the database provides examples of non-permitted claims, further clarifying what is allowed and what is not. The nutritional composition of each of the three selected products was checked by examining the respective brands' official websites, in order to choose a component on which to base the health claim. For each DS product, a specific component was chosen to form the basis of a health claim within the Instagram captions. For example, vitamin C was selected for the "SilSolution" product, vitamin D for "Sunny D3 Gummies", and zinc for "Hair + Energy". Subsequently, scientific claims for all three DS components were selected via the claims database and are displayed in Table 1. The scientific claims were adopted from the claims database, with no alterations made by the researcher to Set 1 and Set 2, to maintain their factual accuracy intact. In order to make sure the level of health literacy was similar in all cases, the scientific claims in Set 3 were altered to be more complex than originally, whilst maintaining factual correctness and while adhering to EFSA regulations. This was done to further guarantee a possible difference in perceived accuracy between Sets 1, 2 and 3 would not be caused by a lower required health literacy in Set 3.

In contrast to scientific claims, which focus on factual information, soft claims encompass more personalized content. For instance, Table 1 presents the scientific claim "Vitamin C contributes to the normal formation of collagen for the normal functioning of the skin", articulating the scientifically established relationship between vitamin C (a component of the DS product) and the skin's normal functioning (health). On the other hand, the soft claim "When you take vitamin C, your skin will feel much stronger and healthier" imparts personal subjective information, specifically the perceived sensation of stronger and healthier skin. To formulate the soft claims featured in Table 1, the researcher created statements containing an unproven causality, inspired by the examples of non-permitted claims in the claims database. Since the questionnaire was written in Dutch, all claims were formulated in Dutch. A list of the claims in Dutch is displayed in Appendix B.

In crafting authentic Instagram captions for both types of claims, a concluding sentence was incorporated into each claim. This final sentence included a call to action accompanied by a hashtag and an emoji. The decision to include the call to action, hashtag, and emoji, was made to closely mirror the style of original posts by brands and influencers. However, it is worth noting that the presence of a call to action may potentially influence purchase intention. A list of all Instagram captions is included in Appendix C.

Table 1

An oversight of the health claims used, categorized by the four experimental conditions.

Set	Conditions	Claim	Advertiser
1	Influencer, soft claim	When you take vitamin C, your skin will feel much stronger and healthier.	Rianne Atiya Product: Vitakruid, SilSolutions
	Influencer, scientific claim	Vitamin C contributes to the normal formation of collagen for the normal functioning of the skin.	Rianne Atiya Product: Vitakruid, SilSolutions
	Brand, soft claim	When you take vitamin C, your skin will feel much stronger and healthier.	Vitakruid Product: Vitakruid, SilSolutions
	Brand, scientific claim	Vitamin C contributes to the normal formation of collagen for the normal functioning of the skin.	Vitakruid Product: Vitakruid, SilSolutions
2	Influencer, soft claim	When you take vitamin D, you are less likely to get sick.	Britt Wijnne Product: Yummy Gums, Sunny D3 Gummies
	Influencer, scientific claim	Vitamin D contributes to the normal functioning of the immune system.	Britt Wijnne Product: Yummy Gums, Sunny D3 Gummies
	Brand, soft claim	When you take vitamin D, you are less likely to get sick.	Yummy Gums Product: Yummy Gums, Sunny D3 Gummies
	Brand, scientific claim	Vitamin D contributes to the normal functioning of the immune system.	Yummy Gums Product: Yummy Gums, Sunny D3 Gummies
3	Influencer, soft claim	When you take zinc, you experience less hair loss.	Marianne Mota Product: JS Health, Hair + Energy
	Influencer, scientific claim	Zinc contributes to the synthesis of keratin and the maintenance of shiny hair.	Marianne Mota Product: JS Health, Hair + Energy
	Brand, soft claim	When you take zinc, you experience less hair loss.	JS Health Product: JS Health, Hair + Energy
	Brand, scientific claim	Zinc contributes to the synthesis of keratin and the maintenance of shiny hair.	JS Health Product: JS Health, Hair + Energy

Note. Scientific claims in set 3 are partially based on research by Anggraini et al. (2022).

3.4 Measurement

To measure participants' purchase intention after exposure to a DS product advertisement, a set of four statements adapted from Belanche et al. (2021) was employed (see Appendix A). Participants expressed their agreement with each statement using a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). An example of a statement used for this purpose is: 'It is likely that I am going to purchase the product.'. The mean score across all four items formed the basis of the purchase intention scale.

Participants' perceived accuracy of the claims presented in DS advertisements was assessed through their agreement with three specifically crafted statements for this study (see Appendix A). This measure also utilized a 7-point Likert scale. Among these statements, the first two examined whether participants perceived the claims as scientifically substantiated, while the third statement inquired about participants' perception regarding claims based on personal experience. As the study defines perceived accuracy as consumers' perception of DS claims being scientifically supported, the formulation of the first two statements directly aligns with this definition. The formulation of the third statement caused some recoding of the results to be necessary in order to correctly combine results.

The questionnaire also encompassed demographic questions aimed at describing the sample's characteristics.

Finally, two statements regarding the control variables — social media usage and influenced purchase behavior — were measured in the questionnaire. In the first statement, participants were asked about their engagement with social media platforms (either they use social media or not). In the second statement, participants were asked whether they had previously made purchases influenced by social media posts (either they had previously purchased a DS product or not). Variations in participants' engagement levels of social media could influence their responses to different types of advertisements and claims. For example, individuals who spend more time scrolling through social media might show different perceived accuracy when exposed to soft claim advertisements compared to those who do not use social media. Similarly, participants' previous experiences with making purchases after being influenced by social media posts could affect their response to the stimuli in the study. For example, an individual who previously made a purchase after encountering a product on social media might show different purchase intentions when exposed to influencer advertisements compared to those who have never engaged in such behavior.

3.5 Procedure

Participants engaged in an online questionnaire, designed in Qualtrics, to simulate exposure to DS product advertisements of either brands or influencers, making either soft or scientific claims. The participants were recruited through the researcher's social network and were randomly assigned to one of the four aforementioned experimental conditions. The questionnaire started with an introduction that informed participants about the questionnaire's topic, emphasized the confidentiality of their data, and highlighted the voluntary nature of their participation. The introduction concluded by explicitly asking for the participants' consent to participate in the questionnaire.

After the introduction, participants were exposed to three DS product advertisements presented in the form of Instagram posts. Participants engaged with one Instagram post at a time, with each post representing the same experimental condition. After viewing the first post, participants immediately provided responses to measures

assessing their purchase intention DS products and their perceived accuracy of DS health claims. This process was repeated for the two remaining Instagram posts.

Participants were then asked about their Instagram usage and their history of DS purchases and usage. In the last part, participants answered demographic questions. The questionnaire concluded with a debriefing, providing participants with additional information about the study's purpose and nature, and thanking them for their participation. The questionnaire took an average of 5 minutes for participants to complete.

4. Results

In this chapter the outcomes of the study's data analysis are revealed. Section 4.1 presents an analysis of the control variables. By employing two two-way analyses of variances (ANOVAs) the potential impact of the control variables on the dependent variables — perceived accuracy and purchase intention — is investigated. Moving forward, section 4.2 delves into the results for perceived accuracy. Concluding the chapter, Section 4.3 unveils the findings derived from the two-way ANOVA concerning purchase intention.

4.1 Control Variables

During data collection, two separate items were utilized as control variables, namely social media usage and influenced purchase behavior. To test if these control variables had any influence on the dependent variables, two two-way ANOVAs were conducted. Table 2 displays the frequencies for both control variables.

The first two-way ANOVA tested the influence of social media usage, where participants were asked if they were active on social media platforms. The ANOVA showed no main effect for type of advertisement ($F(1, 116) = 0.15$, $p = .693$, $\eta_p^2 = 0.00$). In contrast, a significant main effect was found for type of claim ($F(1, 116) = 7.68$, $p = .007$, $\eta_p^2 = 0.06$). The mean score for participants in the soft claim conditions was higher ($M = 1.12$, $SD = 0.32$) than for participants in the scientific claim conditions ($M = 1.00$, $SD = 0.00$). Notably, the variable contained two levels (1 = yes, 2 = no), leading all mean scores fall within 1.00 and 2.00. Furthermore, no interaction effect was found ($F(1, 116) = 0.16$, $p = .693$, $\eta_p^2 = 0.00$). To conclude, participants' social media usage was not consistent across the conditions, meaning that this could have biased the analyses.

The second two-way ANOVA explored the effect of influenced purchase behavior. Here, participants were asked if they had ever purchased a product after seeing a post on social media. To start, there was no main effect revealed for type of advertisement ($F(1, 116) = 0.91$, $p = .342$, $\eta_p^2 = 0.00$). Next, again no main effect was found for type of claim ($F(1, 116) = 0.04$, $p = .849$, $\eta_p^2 = 0.00$). Finally, the ANOVA showed no interaction effect ($F(1, 116) = 0.91$, $p = .342$, $\eta_p^2 = 0.00$). To conclude, since participants' previous purchase behavior was similar for participants across all conditions, it could not have biased the analyses.

Table 2

Frequency Table Control Variables

Type of advertisement	Type of claim	Social media usage		Influenced purchase behavior	
		Yes	No	Yes	No
Influencer	Soft	26	4	20	10
	Scientific	30	0	17	13
Brand	Soft	27	3	20	13
	Scientific	30	0	22	8

4.2 Perceived Accuracy

To investigate participants' perceived accuracy of DS health claims, the perceived accuracy score consisting of three items rated on a 7-point Likert scale was used. Among the three items, one item was recoded. Since the perceived accuracy was measured for three different advertisements, the score on each advertisement was combined into an overall perceived accuracy score.

Initial analysis using Cronbach's alpha indicated poor reliability for the combined scale of all items and advertisements (α = .38). Subsequently, upon removing one of the statements ("I think the claim is determined based on personal experience."), Cronbach's alpha substantially increased to .76, suggesting a sufficient internal consistency. Therefore, two two-way ANOVAs were conducted for perceived accuracy. The first ANOVA incorporated the scientific accuracy of the perceived accuracy score, consisting of two items: "I think the claim is true", and "I think the claim is scientifically supported". The second ANOVA included the personal experience of the perceived accuracy score, consisting of the abovementioned item on personal relevance. The means and standard deviations for the two perceived accuracy scores are displayed in Table 3.

Table 3

Perceived Accuracy Scores

Type of advertisement	Type of claim	Perceived accuracy score: scientific accuracy	Perceived accuracy score: personal experience
Influencer advertisement	Soft claim	*M* = 3.25 *SD* = 0.98	*M* = 4.22 *SD* = 1.00
	Scientific claim	*M* = 3.77 *SD* = 1.18	*M* = 4.41 *SD* = 1.14
	Total	*M* = 3.51 *SD* = 1.11	*M* = 4.32 *SD* = 1.07
Brand advertisement	Soft claim	*M* = 3.67 *SD* = 1.01	*M* = 4.00 *SD* = 0.97
	Scientific claim	*M* = 3.95 *SD* = 1.25	*M* = 4.46 *SD* = 1.15
	Total	*M* = 3.81 *SD* = 1.14	*M* = 4.23 *SD* = 1.08
Total	Soft claim	*M* = 3.46 *SD* = 1.01	*M* = 4.11 *SD* = 0.98
	Scientific claim	*M* = 3.86 *SD* = 1.21	*M* = 4.43 *SD* = 1.14

	Total	*M* = 3.66 *SD* = 1.13	*M* = 4.27 *SD* = 1.07

4.2.1 Perceived Accuracy Score: Scientific Accuracy

The first perceived accuracy score was calculated for perceived scientific accuracy. First, the normality of all four combinations of the variables was tested. The scores for the conditions "influencer advertisement with a soft claim" (*M* = 3.25, *SD* = 0.98, skewness *z* = -1.60, kurtosis *z* = 0.19), and "brand advertisement with a scientific claim" (*M* = 3.95, *SD* = 1.25, skewness *z* = 0.35, kurtosis *z* = -0.75) were normally distributed. However, the other two scores for the conditions were not normally distributed: "influencer advertisement with a scientific claim" (*M* = 3.76, *SD* = 1.18, skewness *z* = -2.18, kurtosis *z* = 0.71), and "brand advertisement with a soft claim" (*M* = 3.67, *SD* = 1.01, skewness *z* = -2.10, kurtosis *z* = 1.23). Therefore, the assumption of normality was not met for the perceived scientific accuracy variable. The two-way ANOVA is fairly robust against the violations of these assumptions, but the outcomes may not be completely reliable.

Subsequently, the first two-way ANOVA was conducted, with perceived scientific accuracy as the dependent variable. The two-way ANOVA showed no main effect of type of advertisement ($F(1, 116) = 2.19$, $p = .142$, $\eta_p^2 = 0.02$). However, for type of claim, the two-way ANOVA did show a significant main effect ($F(1, 116) = 3.89$, $p = .051$, $\eta_p^2 = 0.03$). The perceived scientific accuracy for scientific claims was significantly higher (*M* = 3.86, *SD* = 1.21) than for soft claims (*M* = 3.46, *SD* = 1.01). Lastly, no significant interaction effect was found with the two-way ANOVA ($F(1, 116) = 0.33$, $p = .566$, $\eta_p^2 = 0.00$). All perceived accuracy scores are displayed in Table 3.

4.2.2 Perceived Accuracy Score: Personal Experience

The second perceived accuracy score was related to personal experience. To start, the assumption of normality was analyzed for all four conditions. For three conditions the normality assumption was met: "influencer advertisement with a soft claim" (*M* = 4.22, *SD* = 1.00, skewness *z* = 1.10, kurtosis *z* = -0.93), "influencer advertisement with a scientific claim" (*M* = 4.41, *SD* = 1.14, skewness *z* = 1.03, kurtosis *z* = -0.12), and "brand advertisement with a scientific claim" (*M* = 4.46, *SD* = 1.15, skewness *z* = 0.07, and kurtosis *z* = 0.21). However, for the condition "brand advertisement with a soft claim" skewness occurred and therefore the assumption of normality was not met (*M* = 4.00, *SD* = 0.97, skewness *z* = 2.43, kurtosis *z* = 1.94). While the two-way ANOVA can withstand certain violations of these assumptions to some extent, the results may not be entirely reliable.

The second two-way ANOVA for the perceived accuracy score was conducted. The two-way ANOVA did not reveal a significant main effect on the type of advertisement ($F(1, 116) = .21$, $p = .649$, $\eta_p^2 = 0.00$). Similarly, for type of claim, there was no significant main effect either ($F(1, 116) = 2.73$, $p = .101$, $\eta_p^2 = 0.02$), contrary to the main effect for perceived scientific accuracy. Finally, the two-way ANOVA showed no significant interaction effect ($F(1, 116) = 0.47$, $p = .496$, $\eta_p^2 = 0.00$). All perceived accuracy scores are displayed in Table 3.

4.3 Purchase Intention

The participants' intention to buy a product was investigated by the purchase intention measure. The purchase intention score was measured using four items on a 7-point Likert scale. The scale exhibited good reliability with a Cronbach's alpha of .81. The means and standard deviations for purchase intention across conditions are displayed in Table 4.

Table 4

Purchase Intention Scores

Type of advertisement	Type of claim	Purchase intention score
Influencer advertisement	Soft claim	*M* = 2.30 *SD* = 0.87
	Scientific claim	*M* = 2.10 *SD* = 099
	Total	*M* = 2.20 *SD* = 0.93
Brand advertisement	Soft claim	*M* = 3.07 *SD* = 0.99
	Scientific claim	*M* = 2.55 *SD* = 1.09
	Total	*M* = 2.81 *SD* = 1.07
Total	Soft claim	*M* = 2.68 *SD* = 1.00
	Scientific claim	*M* = 2.33 *SD* = 1.06
	Total	*M* = 2.51 *SD* = 1.04

The assumption of normality was met for the purchase intention in all four conditions: "influencer advertisement with a soft claim" (*M* = 2.30, *SD* = 0.87, skewness *z* = -0.33, kurtosis *z* = -1.53), "influencer advertisement with a scientific claim" (*M* = 2.10, *SD* = 0.99, skewness *z* = 1.52, kurtosis *z* = -0.52), "brand advertisement with a soft claim" (*M* = 3.07, *SD* = 0.99, skewness *z* = -1.12, kurtosis *z* = -1.06), and "brand advertisement with a scientific claim" (*M* = 2.55, *SD* = 1.09, skewness *z* = 0.78 and kurtosis *z* = -1.00). Due to normality, the two-way ANOVA will not be violated, which means the results are reliable.

A significant main effect on type of advertisement was shown by the two-way ANOVA ($F(1, 116) = 11.40$, $p < .001$, $\eta_p^2 = 0.09$).The purchase intention for brand advertisements was significantly higher ($M = 2.81$, $SD = 1.07$) than for influencer advertisements ($M = 2.20$, $SD = 0.93$). Furthermore, the two-way ANOVA again showed a significant main effect on type of claim ($F(1, 116) = 3.97$, $p = .049$, $\eta_p^2 = 0.03$). The purchase intention for soft claims was significantly higher ($M = 2.68$, $SD = 1.00$) than for scientific claims ($M = 2.33$, $SD = 1.06$). Lastly, no significant interaction effect was found ($F(1, 116) = 0.84$, $p = .362$, $\eta_p^2 = 0.00$).

5. Conclusion

In this study, six hypotheses were formulated to investigate the effects of type of advertisement (brand advertisement or influencer advertisement) and type of health claim (soft or scientific) in dietary supplement (DS) marketing on consumers' perceived accuracy of health claims and purchase intentions. In order to adequately analyze perceived accuracy, a distinction was made between perceived scientific accuracy and perceived personal accuracy.

H1a posited that consumers' perceived accuracy of DS health claims would be significantly higher for brand advertisements compared to influencer advertisements. However, the results failed to support this hypothesis, neither for scientific relevance nor for personal relevance, showing that the source of the advertisement did not significantly influence consumers' accurate perceptions of DS health claims. H2a predicted that consumers' purchase intentions would be significantly higher for influencer advertisements compared to brand advertisements. Surprisingly, the results revealed a significant main effect in the opposite direction, with purchase intentions being significantly higher for brand advertisements. Thus, H2a was rejected based on the observed data, but there was an interesting effect of type of advertisement nonetheless.

When it comes to type of claim, H1b proposed that consumers' perceived accuracy of DS health claims would be higher for scientific claims than for soft claims. While the data supported this hypothesis by revealing a significant main effect in the expected direction for the scientific accuracy of the perceived accuracy scores, it did not show a significant main effect on personal experience of the perceived accuracy scores. As such, the results showed partial support for H1b, suggesting a nuanced relationship between the type of claim and perceived accuracy. Further evidence for the impact of type of claim came from the results for H2b, on the effect of type of claim on purchase intention. H2b proposed that consumers' purchase intentions would be higher for soft DS health claims than for scientific DS health claims, a hypothesis that was supported by the results.

Finally, two hypotheses were formulated for the interaction between type of advertisement and type of claim. H1c hypothesized that the combined influence of these two variables on consumers' perceived accuracy of DS health claims would be biggest when participants were influenced by brand advertisements with scientific claims. For purchase intention, the combined effect of the two independent variables was expected to be biggest when participants were presented with influencer advertisements with soft claims, as predicted by H2c. However, no interaction effects were observed in the current study, leading to the rejection of both H1c and H2c.

6. Discussion

This final chapter provides an analysis and interpretation of the results found in the current study. Section 6.1 initiates the discussion by delving into the theoretical implications of the findings, focusing on the hypotheses that were formulated for this research. Section 6.2 reflects on the study's limitations and suggestions for future research. 6.3 finalizes the discussion with a take home message.

6.1 Discussion of the Results

6.1.1 Type of Advertisement

The two types of advertisement that were manipulated in this study were brand advertisements and influencer advertisements. H1a stated that consumers' perceived accuracy of DS health claims would be significantly higher when exposed to a brand advertisement rather than an influencer advertisement. This hypothesis was set because brands can be considered experts on their own products and expertise can make consumers more likely to agree with the message they are shown (Reichelt et al., 2014). The results did not support the hypothesis, as they failed to display a significant influence of the type of advertisement on neither perceived scientific accuracy nor perceived personal accuracy.

While a significant effect was hypothesized, lack thereof is not entirely unsuspected, due to the nature of perceived accuracy as a dependent variable and its closer relation to the independent variable type of claim compared to type of advertisement. Perceived accuracy measures the level of correctness of a claim, according to the participant. Brand advertisements and influencer advertisements could only influence perceived accuracy with their different ways of presenting advertisements. The text within the advertisement represents the type of claim, and therefore does not influence the variable type of advertisement. Thus, a certain opinion formed, or atmosphere felt by a participant after seeing a brand or influencer advertisement, could have influenced the perceived accuracy. This could be due to the brands' or influencers' expertise, or social status, for example. However, it is more likely to expect the content of the message, the type of claim, to be mainly of influence on perceived accuracy, since perceiving information accurately requires mainly the processing of the text within an advertisement.

Secondly, it is possible that participants were not familiar with the DS brands and thus were not necessarily influenced by any status or credibility these brands might have among their audience. While H1a could not be supported by the results, neither do they show a positive effect of influencer advertisements on perceived accuracy. A lack of this result could similarly be explained, due to the participants not necessarily having a previously formed opinion or even relationship regarding the influencers used, which is often the cause of influencer effectiveness in marketing (Yuan & Lou, 2020). The influencers varied in the size of their follower base, ranging from mega-influencer to nano-influencer. These differences could have influenced participants' familiarity with each influencer. Particularly, micro and nano-influencers like Marianne Mota and Britt Wijnne, with smaller followings compared to mega-influencer Rianne Atiya, may be less recognized among the participants. Consequently, this could have caused that there was a lack of trust between the participants and these influencers. To address this, measuring trust in influencers as a control variable in the questionnaire could have been beneficial. This data could have offered insights into the impact of trust on purchase intention and perceived accuracy.

H2a stated that consumers' purchase intention was expected to be significantly higher amongst individuals who had seen an influencer advertisement rather than a brand advertisement. This was hypothesized, because research shows that influencers are deemed more trustworthy by their audience (Lou & Yuan, 2019), which creates a closer (parasocial) relationship between consumers and influencers (Ao et al., 2023). The results showed the opposite to be true, with the purchase intention being significantly higher among participants exposed to a brand advertisement. This caused H2a to be rejected. While this was not expected, several factors could have caused this result.

For one, both Lou and Yuan (2019) and Ao et al. (2023) did not conduct research about influencers specifically related to DS or other food and health information. These areas of information might require a higher level of trust, or perhaps be more reliant on the expertise of an influencer, than for example fashion, because taking a supplement could have impact on your wellbeing. The literature refers to this increase in trust and increased interest in products endorsed by influencers as an effect of a developed parasocial relationship (Yuan & Lou, 2020). Participants in this study did not necessarily know the influencers used and were likely not to have a developed parasocial relationship with them. Finally, an important advantage of using influencer marketing, is the ability to precisely target consumer segments by making use of specific influencers, whose audience might have a previously developed interest in the product which is being marketed (Leung et al., 2022). This was not necessarily the case in this study, as there was no demographic requirement for participants.

6.1.2 Type of Claim

The second independent variable in this research was type of health claim. H1b stated that scientific claims would have a significantly bigger effect on perceived accuracy than soft claims. Because scientific claims are more often scientifically accurate, it was assumed that the participants would also perceive the claims as such. The results showed partial support for H1b. This is possible due to the split made within the scale, which is further reflected on in 6.2. The perceived scientific accuracy was proven significantly higher for scientific claims than for soft claims, but a significant main effect on the perceived personal accuracy was not found.

A positive effect on the perceived scientific accuracy by scientific claims was hypothesized, due to these claims' adherence to health claim regulations established by the European Food Safety Authority (EFSA) (NVWA & Lugt Food Law, 2021). These regulations are designed to prevent misinformation and to make sure health claims contain science-based causality between ingredients in DS and effects on health. Because these causal relationships were clearly presented in the scientific claims, the higher perceived accuracy among participants was expected, due to the claims being clearer than soft claims. On the contrary, soft claims generally make more use of feelings rather than scientifically proven causal relationships and do not necessarily follow EFSA regulations. The use of feelings in soft claims could cause participants to be less convinced of the scientific bases of these claims (Aschemann-Witzel & Grunert, 2015).

H2b stated that soft claims would have an effect which increased consumers' purchase intentions more than scientific claims would. This was hypothesized because soft claims were expected to be more easily processed by consumers who are scrolling on social media, compared to scientific claims. The Elaboration Likelihood Model (ELM) was used to explain the processing of these claims (Petty & Cacioppo, 1986), with soft claims likely being

easier to process due to their contents often containing peripheral cues. This easier processing could in turn increase the chance of changing a follower's attitude by influencing the purchase intention. H2b was supported by the results, with the purchase intention for soft claims scoring significantly higher than for scientific claims.

A possible explanation for this effect could be the personal experiences included in the soft claims provided a message that was indeed easier to process than the factual scientific claim, in line with the ELM. Another explanation might be that the social media platform that was mimicked in the current study (Instagram) usually shows users soft claims. This in turn might make participants exposed to a scientific claim feel like there is a mismatch between the platform and the caption. Because all participants exposed to a scientific claim were social media users, they could have experienced this mismatch, causing them to perceive the post as unnatural, which in turn could have lowered their purchase intention. Contrarily, the control variable social media usage showed that the participant group exposed to soft claims did contain non-social media users. While a mismatch would not likely be the cause of higher or lower purchase intention among this group, due to soft claims matching well with Instagram, other factors could be relevant. Non-social media users could for example have been less trusting of social media posts or perhaps have processed them more thoroughly, due to their lack of experience with the platform.

In addition to the main hypotheses, the role of control variables was crucial for understanding the observed effects. Notably, the control variable social media usage showed a significant main effect for the type of claim, indicating differences between groups exposed to soft and scientific claims. Interestingly, all participants exposed to scientific claims were social media users, while some in the soft claim groups were not. This uneven distribution suggests potential influence on outcomes, causing the results to be biased and the reliability to be lower. This underscores the importance of accounting for control variables. For the control variable influenced purchase behavior no significant differences were found.

6.1.3 Interaction Effects Between Types of Advertisements and Types of Claims

H1c stated that the condition of "brand advertisement" and "scientific claim" would have the greatest influence on consumers' perceived accuracy regarding DS health claims. This was hypothesized due to an expected additive effect of both hypothesized main effects in H1a and H1b. The results were not able to support this hypothesis and H1c was rejected. While the study was able to support a significant effect of scientific claims on perceived scientific accuracy, the type of advertisement did not show significant effects. Considering the platform normally exposing users to soft influencer claims rather than scientific brand posts, could have caused the absence of an interaction effect, especially since most participants bring active social media users.

H2c stated that purchase intention would have been most influenced by a combined effect of the two independent variables "influencer advertisement" and "soft claim". This was hypothesized, based on an expected additive effect of the hypothesized main effects in H2a and H2b. However, H2c was not supported by the results, with no interaction effect being found. Soft claims did show to affect consumers' purchase intention more than scientific claims. Unexpectedly, brand advertisements were found to have a significantly higher effect on consumers' purchase intention in comparison to influencer advertisements. It could be argued that an interaction effect might indeed exist in reality, as consumers often develop parasocial relationships with the influencers they follow. The absence of this

interaction in the current research could result from participants potentially lacking such relationships with the influencers.

6.2 Limitations and Suggestions for Future Research

Reflecting on the experiment, several limitations were found to be relevant. It is important to note that these limitations do not make the results less significant, but could have impact on the reliability of the experiment.

To accurately analyze the results regarding perceived accuracy, a necessary distinction was made between the levels in the scale. The statements “I think the claim is true” and “I think the claim is scientifically supported” had their scores combined to represent the perceived scientific accuracy. The question “I think the claim is determined based on personal experience” represents the perceived personal accuracy. Originally measuring perceived accuracy was thought to be done by using 3 items within a scale. However, reliability analysis showed insufficient internal consistency. When creating the scale, the items measuring perceived scientific accuracy aimed to assess how participants viewed the claim's alignment with (scientific) accuracy. Conversely, the single item representing perceived personal accuracy essentially mirrored this assessment, but through the lens of (scientific) inaccuracy.

While the intention behind using contrasting items was valid, it could be questioned if the inclusion of the single item representing perceived personal accuracy was truly beneficial. Firstly, it could be argued that the wording of the item representing perceived personal accuracy was not nuanced enough. The phrase “I think the claim is determined based on personal experience” might imply a sense of disbelief or skepticism within its meaning. This potentially could have led to participants’ misinterpretations. A more literal translation such as “I think the claim is not true” could have prevented these possible misinterpretations. Secondly, the sudden shift in the use of mirrored wording in the item might have led to confusion among participants. The use of consistency in wording possibly could have prevented the confusion. Furthermore, research by Kamoen et al. (2013) found that respondents react differently to positively and negatively phrased questions and thus advised against mixing the phrasing direction within one scale. Thirdly, both the wrong wording and the sudden nature of the mirrored item might have made the statement a bit leading, revealing some of the nature of the experiment and leading participants in a certain direction. Future research could benefit from refining these aspects to ensure the validity and reliability of perceived accuracy measurements.

Another limitation of this study could be the direct relation which “perceived accuracy” as a dependent variable has with “type of claim” as an independent variable. When asking participants a direct question regarding the claims, it could be argued that “type of advertisement” becomes less relevant of an independent variable opposed to “type of claim”. This could have been avoided by rephrasing the statements in the questionnaire and focusing more on the complete post rather than the claim.

In this study no requirements were set for participants, which could have had impact on the results. The study researched the participants’ perceived accuracy of claims or their purchase intention regarding DS. The scores in the results could possibly be different when asking the same questions to participants with knowledge about DS products or with familiarity with the brands. For instance, participants with knowledge about DS products might, due to their familiarity with the domain, have a better understanding of the claims and possibly have a judgement about certain claims and advertisers. Both their

understanding and judgment could have an influence on perceived accuracy and purchase intention. Similarly, participants with prior familiarity with the brands might have either positive or negative opinions, influencing their responses to the claims and advertisers presented.

This study did not incorporate the measurement of participants' trust in influencers as a control variable. Assessing participants' recognition of the influencers and their level of trust in them, could have yielded valuable insights into the existence of parasocial relationships between participants and the influencers. Such relationships might have influenced the purchase intention or perceived accuracy in this study. Particularly interesting is if the variation in follower bases among the influencers did caused differences in participant's familiarity with and trust in each influencer.

Finally, analysis of the control variables showed that the participants were not similar in the extent to which they use social media in their daily lives. Among the participants exposed to soft claims some were not social media users, but among the participants exposed to scientific claims everyone was a social media user. As explained earlier, this difference could be a possible cause for differences in the perceived accuracy and purchase intentions among the different groups, which could have been prevented with a more even distribution.

On top of future research that could follow from limitations, also some future directions could be defined that focus on specific aspects of the independent variables. For example, for type of advertisement an experiment could be setup, by making use of the inherent advantages certain types of advertisements have. The parasocial relationship some followers of influencers have with the influencer, could for example be an advantage to focus on in future research. A study could research the attitudes regarding DS of an influencer's audience compared to a general population. It might be expected that an influencer's audience, due to their parasocial relationship with the influencer, would have a higher purchase intention and higher perceived accuracy of DS, compared to the general population. Similarly, a study could be done by comparing the attitudes of DS users and non-DS users. Possibly, DS users might have higher perceived accuracy compared to non-DS users, due to their familiarity with the products. Moreover, the purchase intention for DS users can be expected to be higher than for non-DS users, given their established purchase history of DS products. These findings might be useful to measure the importance of trust and relationships between brands or influencers and consumers, and its impact on consumers perceived accuracy and purchase intentions.

For type of claim it could be interesting to focus on not only the perceived accuracy of participants but also participants' actual accuracy of understanding the claims. For example, one could show either a scientific or soft claim of a certain DS and ask the participant questions related to the effects of the DS on health. It could be expected that the participants exposed to scientific claims have a higher accurate understanding than those exposed to soft claims, due to the causality and factual correctness of the scientific claim. However, understanding the scientific claims requires a higher literacy, whereas the soft claims might explain things in a more understandable way. Therefore, it could also be the case that the soft claims, despite their absence of causality, lead to participants answering or guessing the accurate meaning of the claim. These results could be useful to measure the effects of regulations on consumer understanding or purchase intentions.

6.3 Take Home Message

Current study found consumers to have a greater perceived accuracy of DS health claims when exposed to scientific claims compared to soft claims, regardless of the advertisement type. Presumably, the factuality and causality associated with scientific claims contribute to this perception, potentially informing consumers about the proper use of DS and mitigating associated health risks, such as vitamin surpluses. However, despite the higher perceived accuracy of scientific claims, it is important to consider the context in which DS advertisements are encountered, namely, leisure settings and on social media platforms. These environments may demand lower levels of mental processing, making soft claims more appealing due to their simplicity. The study found that soft claims significantly lead to higher purchase intentions of DS compared to scientific claims. Given the susceptibility of soft claims to convey health misinformation, it is crucial that soft claims do not overshadow scientific claims in DS marketing. It underscores the importance of exploring methods to communicate scientific claims in a more accessible and processable manner that could not only enhance perceived accuracy but also elevate purchase intentions. Additionally, governing all types of advertisers marketing DS to disseminate only scientific claims is essential. Consequently, a higher perceived accuracy of DS health claims and increased purchase intentions among consumers could lead to more informed consumer decision-making, thereby safeguarding public health.

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Appendix A

Below, the list of statements that were included in the questionnaire can be found. For each scale both the Dutch and English version are included.

Perceived Accuracy Scale: Dutch Version
In de Instagram-post werd in de begeleidende tekst (Instagram-caption) het volgende gezegd: [Instagram Caption].
De volgende stellingen gaan over deze bewering.

1. Ik denk dat de bewering waar is.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

2. Ik denk dat de bewering wetenschappelijk onderbouwd is.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

3. Ik denk dat de bewering is gebaseerd op een persoonlijke ervaring.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

Perceived Accuracy Scale: English Version
The accompanying text (Instagram caption) of the Instagram post stated the following: [Instagram Caption].
The following statements relate to this assertion.

1. I think the claim is true.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

2. I think the claim is scientifically supported.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

3. I think the claim is determined based on personal experience.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

Purchase Intention Scale: Dutch Version
De volgende stellingen gaan over het voedingssupplement [productnaam] dat werd getoond in de Instagram-post.

1. Ik zou overwegen om het product te kopen.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

2. Ik ga erover nadenken om het product te kopen

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

3. Het is waarschijnlijk dat ik het product ga kopen.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

4. De volgende keer dat ik dit type product nodig heb, koop ik waarschijnlijk deze.

Helemaal mee oneens	Sterk mee oneens	Oneens	Neutraal	Eens	Sterk mee eens	Helemaal mee eens

Purchase Intention Scale: English Version
The following statements relate to the dietary supplement [product naam] that was featured in the Instagram post.

1. I would consider purchasing the product.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

2. I would contemplate the option of buying the product.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

3. It is likely that I am going to purchase the product.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

4. Next time I need this type of product, I will probably buy this one.

Strongly disagree	Disagree	Somewhat disagree	Either agree or disagree	Somewhat agree	Agree	Strongly agree

Appendix B

Table B1

A List of all Claims in Dutch

Set	Conditions	Claim	Advertiser
1	Influencer, soft claim	Wanneer je vitamine C inneemt voelt je huid veel sterker en gezonder aan.	Rianne Atiya Product: Vitakruid, SilSolutions
	Influencer, scientific claim	Vitamine C draagt bij tot de normale collageenvorming voor de normale werking van de huid.	Rianne Atiya Product: Vitakruid, SilSolutions
	Brand, soft claim	Wanneer je vitamine C inneemt voelt je huid veel sterker en gezonder aan.	Vitakruid Product: Vitakruid, SilSolutions
	Brand, scientific claim	Vitamine C draagt bij tot de normale collageenvorming voor de normale werking van de huid.	Vitakruid Product: Vitakruid, SilSolutions
2	Influencer, soft claim	Wanneer je vitamine D inneemt word je minder snel ziek.	Britt Wijnne Product: Yummy Gums, Sunny D3 Gummies
	Influencer, scientific claim	Vitamine D draagt bij tot de normale werking van het immuunsysteem.	Britt Wijnne Product: Yummy Gums, Sunny D3 Gummies
	Brand, soft claim	Wanneer je vitamine D inneemt word je minder snel ziek.	Yummy Gums Product: Yummy Gums, Sunny D3 Gummies
	Brand, scientific claim	Vitamine D draagt bij tot de normale werking van het immuunsysteem.	Yummy Gums Product: Yummy Gums, Sunny D3 Gummies
3	Influencer, soft claim	Wanneer je zink inneemt ervaar je minder haaruitval	Marianne Mota Product: JS Health, Hair + Energy
	Influencer, scientific claim	Zink draagt bij aan de synthese van keratine en het behoud van glanzend haar.	Marianne Mota Product: JS Health, Hair + Energy
	Brand, soft claim	Wanneer je zink inneemt ervaar je minder haaruitval	JS Health Product: JS Health, Hair + Energy
	Brand, scientific claim	Zink draagt bij aan de synthese van keratine en het behoud van glanzend haar.	JS Health Product: JS Health, Hair + Energy

Note. Scientific claims in set 3 are partially based on research by Anggraini et al. (2022).

Appendix C

Table C1

The English Version of the Instagram Captions

	Group A **Influencer, Soft**	**Group B** **Influencer, Scientific**	**Group C** **Brand, Soft**	**Group D** **Brand, Scientific**
Set 1	SilSolutions contains vitamin C. When you take vitamin C, your skin will feel much stronger and healthier. Therefore, use SilSolutions from @vitakruid #ad ✨	SilSolutions contains vitamin C. Vitamin C contributes to the normal formation of collagen for the normal functioning of the skin. Therefore, use SilSolutions from @vitakruid #ad ✨	SilSolutions contains vitamin C. When you take vitamin C, your skin will feel much stronger and healthier. Therefore, use SilSolutions from Vitakruid ✨	SilSolutions contains vitamin C. Vitamin C contributes to the normal formation of collagen for the normal functioning of the skin. Therefore, use SilSolutions from Vitakruid ✨
Set 2	Sunny D3 Gummies contains vitamin D. When you take vitamin D, you are less likely to get sick. Therefore, use Sunny D3 Gummies from @yummygumsvitamins #ad ✨	Sunny D3 Gummies contains vitamin D. Vitamin D contributes to the normal functioning of the immune system. Therefore, use Sunny D3 Gummies from @yummygumsvitamins #ad ✨	Sunny D3 Gummies contains vitamin D. When you take vitamin D, you are less likely to get sick. Therefore, use Sunny D3 Gummies from Yummy Gums ✨	Sunny D3 Gummies contains vitamin D. Vitamin D contributes to the normal functioning of the immune system. Therefore, use Sunny D3 Gummies from Yummy Gums ✨
Set 3	Hair + Energy contains zinc. When you take zinc, you experience less hair loss. Therefore, use Hair + Energy from @jshealthvitamins #ad ✨	Hair + Energy contains zinc. Zinc contributes to the synthesis of keratin and the maintenance of shiny hair.Therefore, use Hair + Energy from @jshealthvitamins #ad ✨	Hair + Energy contains zinc. When you take zinc, you experience less hair loss. Therefore, use Hair + Energy from JS Health ✨	Hair + Energy contains zinc. Zinc contributes to the synthesis of keratin and the maintenance of shiny hair.Therefore, use Hair + Energy from JS Health ✨

Note. The claims included in the questionnaire were all written in Dutch.

Table C2

The Dutch Version of the Instagram Captions

	Group A Influencer, Soft	Group B Influencer, Scientific	Group C Brand, Soft	Group D Brand, Scientific
Set 1	SilSolutions bevat vitamine C. Wanneer je vitamine C inneemt voelt je huid veel sterker en gezonder aan. Gebruik daarom SilSolutions van @vitakruid #ad ✨	SilSolutions bevat vitamine C. Vitamine C draagt bij tot de normale collageenvorming voor de normale werking van de huid. Gebruik daarom SilSolutions van @vitakruid #ad ✨	SilSolutions bevat vitamine C. Wanneer je vitamine C inneemt voelt je huid veel sterker en gezonder aan. Gebruik daarom SilSolutions van Vitakruid ✨	SilSolutions bevat vitamine C. Vitamine C draagt bij tot de normale collageenvorming voor de normale werking van de huid. Gebruik daarom SilSolutions van Vitakruid ✨
Set 2	Sunny D3 Gummies bevatten vitamine D. Wanneer je vitamine D inneemt word je minder snel ziek. Gebruik daarom de Sunny D3 Gummies van @yummygumsvitamins #ad ✨	Sunny D3 Gummies bevatten vitamine D. Vitamine D draagt bij tot de normale werking van het immuunsysteem. Gebruik daarom de Sunny D3 Gummies van @yummygumsvitamins #ad ✨	Sunny D3 Gummies bevatten vitamine D. Wanneer je vitamine D inneemt word je minder snel ziek. Gebruik daarom de Sunny D3 Gummies van Yummy Gums ✨	Sunny D3 Gummies bevatten vitamine D. Vitamine D draagt bij tot de normale werking van het immuunsysteem. Gebruik daarom de Sunny D3 Gummies van Yummy Gums ✨
Set 3	Hair + Energy bevat zink. Wanneer je zink inneemt ervaar je minder haaruitval. Gebruik daarom Hair + Energy van @jshealthvitamins #ad ✨	Hair + Energy bevat zink. Zink draagt bij aan de synthese van keratine en het behoud van glanzend haar. Gebruik daarom Hair + Energy van @jshealthvitamins #ad ✨	Hair + Energy bevat zink. Wanneer je zink inneemt ervaar je minder haaruitval. Gebruik daarom Hair + Energy van JS Health ✨	Hair + Energy bevat zink. Zink draagt bij aan de synthese van keratine en het behoud van glanzend haar. Gebruik daarom Hair + Energy van JS Health ✨