

Buying Motives for Anabolic Supplements – An Analysis among German Recreational Athletes

Daniel Eberhard, Claudia Fantapié Altobelli*

Department of Economic and Social Sciences, Helmut-Schmidt-University (University of the Federal Armed Forces), Hamburg, 22043, Germany

*Corresponding Author: fantapie@hsu-hh.de

Copyright © 2014 Horizon Research Publishing All rights reserved.

Abstract The objective of this exploratory study was to gain first insights into the motives of recreational athletes for buying and consuming anabolic supplements. For this purpose we conducted a qualitative study among young males in Germany between April and May 2012. We used the means-end chain analysis as a methodological approach – a common qualitative research method to uncover buying motives through special in-depth interviews called “laddering”. The sample consisted of n=21 male recreational athletes aged from 21 to 28, all of whom engaged in resistance sports and miscellaneous other disciplines. The findings suggest that the economical use of resources, strive for appreciation amongst peers and by the opposite sex and reducing the risk of ineffective training are likely buying motives for this group.

Keywords Buying Motives, Nutritional Supplements, Sports Nutrition, Means-End Chains, Laddering

1. Introduction

1.1. Background

While being a niche branch for professional athletes in the past, the market for anabolic supplements has nowadays evolved into a market for recreational athletes. Despite suffering from negative press and a considerable amount of lawsuits [1], the branch maintains continuous growth which is largely caused by aggressive marketing campaigns of supplement manufacturers [2]. Unlike pharmaceutical products, nutritional supplements (and the advertising of such) are considerably less regulated by law [3]. Furthermore, their effects are not being as thoroughly researched, which is one reason why supplement producers can and often will use exaggerated promises to sell their products [4]. Nutritional supplements are sold through retail stores, pharmacies, health stores, direct sales and increasingly through the internet. The latter gaining importance because legal sales restrictions with regards to

certain products can be avoided rather easily [5].

In spite of the long history of usage, nutritional supplements are being viewed as very controversial by nutritional and sports scientists. Most experts in this field assume that on the one hand a balanced diet is sufficient and therefore additional supplements are not required [6], on the other hand that the promised effects of nutritional supplements at the very least have not been proven scientifically [4]. Hence, the question arises why recreational athletes spend money on nutritional supplements although their effects are controversial and there are no considerable financial incentives in case these effects would occur.

The objective of this study was to gain first insights into the buying motives of recreational athletes in the field of anabolic supplements as a contribution to explaining their buying behavior. Unlike stimulants (such as vitamin pills), which are used as a means of spotty performance improvement, anabolic supplements are supposed to support muscle growth or body fat reduction in the long run [7]. This study will in particular be focused on the core target group – male recreational athletes aged 18 – 30. In order to capture and operationalize their buying motives, we used the means-end chain approach which is based on so called “laddering” interviews [8].

1.2. Medium Range Buying Motives

Motives in general are targeted, cognitively guided drivers of human behavior that reflect goal-directed arousal [9]. In the context of consumer behavior, the result of an internal drive is a desire of a product, service, or experience [10]. Hence, buying motives are those motives that manifest in the purchase of a certain product. For marketing purposes, so called “medium range motives” are relevant since they are neither too abstract (e.g. self-actualization) nor too object-oriented (meaning too narrow in their definition). Medium range motives include the following categories [11]:

- Economic behavior/frugality/rationality: this basic motive represents the pursuit for economic efficiency.

- Prestige/expression/appreciation: with this social motive, the individual seeks (positive) recognition from his or her social environment.
- (Social) conformity: this motive category summarizes pursuits for affiliation with certain social groups (such as friends, family, co-workers).
- Zest/excitement/curiosity: This motive represents mainly the hedonic objective of “having fun”. In this respect consume serves as a means of self-reward.
- Sex/eroticism: this biological and psychological motive is part of basic human instincts and aims at being attractive to the other sex.
- Fear/risk awareness: being focused on escape, this motive manifests in the pursuit for risk reduction.
- Consistency/dissonance/conflict: this motive represents the individual’s pursuit for harmonizing inconsistent situations.

1.3. Current State of Research

Despite the rapid growth of the supplement branch for non-professional users, only little research has been conducted in this field. Most studies examined the user prevalence with respect to demographic factors such as gender, age, type of sports exercised or type of supplements used. The few studies conducted in Germany investigated the consumption of stimulants in general labeling them as “supplements“, with no explicit focus on anabolic supplements. Extensive studies that take anabolic supplements into consideration have only been conducted outside Germany. Although those differ from each other in terms of research objective, location and sample population to different extents, certain tendencies in their outcome can be observed.

All studies that focused on recreational athletes showed the tendency that anabolic supplements are primarily consumed by men [12-15]. A similar outcome could be observed in studies among professional athletes [16,17]. Furthermore, these studies showed that anabolic supplements are mainly used by the age group of 18 to 30 year olds. Again this applies for both recreational and professional athletes, the latter usually belonging to this age group anyway [12-14,17,18]. Additionally, with the exception of one study [15], it could be noticed that the likelihood of consumption increases along with the sports activity of the individual. Professional athletes tend to consume more anabolic supplements than recreational athletes [12,13,16,17].

With respect to the reasons for and the motives of anabolic supplement consumption, there is still little empirical evidence so far, and none at all for the German market. Reasons for consumption in particular have primarily been researched along with user prevalence, i.e. participants were asked for the reasons for their supplement consumption. Since professional athletes have financial incentives for improving their performance, their reasons for supplement consumption differ considerably from recreational athletes

[2,19]. Therefore, only reasons given by recreational athletes will be taken into consideration in this study.

Recreational athletes named similar reasons for anabolic supplement consumption in different studies. On the one hand, these reasons included different aspects of performance enhancement such as better muscle growth, increased muscle power, better regeneration and a higher sports performance in general. On the other hand, participants named several health-related reasons such as stress reduction, nutritional compensation, weight loss and generally increasing their state of health [13-15].

Only few studies addressed motives for anabolic supplement consumption among recreational athletes directly. Deep-set motives of recreational athletes have been researched in few psychological and sociological studies while they were not regarded in the field of economic science yet. Atkinson [19] researched the topic of sports and anabolic supplements as a means of striving for masculinity, which manifests in social influence, social acknowledgement and a positive self-image. Furthermore, anabolic supplement consumption was described as a reaction to a media driven perception of physical aesthetics. In a qualitative study, Mason/Scammon [20] also found out that striving for a positive self-image is a major motive for physical fitness and anabolic supplement consumption. Supplements in particular were held as a means of achieving personal goals in this respect as fast as possible. Mason/Scammon also found that over time anabolic supplement consumption became part of the social identity of the participants and eventually created a feeling of group affiliation amongst users.

The current state of research shows that motives for anabolic supplement consumption have not been researched intensely yet. Most studies do not focus on motives of, but rather examine reasons for supplement consumption, i.e. direct consequences participants seek to acquire. Both studies that investigate the motives of anabolic supplement consumption mainly have a sociological or psychological perspective and neglect economical aspects. It is therefore the purpose of this empirical analysis to make a contribution to close this research gap and provide a holistic picture of buying motives for anabolic supplements among recreational athletes.

2. Methodology

2.1. The Means-End Approach: Theoretical Background

The method of choice for this study was the so called “means-end” approach which is an appropriate and well-proven tool for uncovering deep-set motives. With this qualitative approach it is possible to identify means-end chains which link attributes of products with values of the customer and consequently illuminate the consumer’s likely buying motives[21]

The basic premise of the means-end-theory is that the

consumer makes a purchase decision based on physical and abstract attributes of the product through which he or she wants to attain certain consequences. Eventually, these consequences are means of achieving personal values. Values in this respect are guiding principles in the individual's behavior. They shape his or her needs, demands and attitudes [22]. Figure 1 shows the basic idea of the means-end approach [23].

Physical attributes of products are physically observable features such as color, size, weight etc. Abstract attributes of products are subjective, less tangible features such as image or design. Functional consequences concern the primary purpose of the product and manifest in directly observable results of product usage (e.g. time saving). Psychosocial consequences are less tangible results of product usage and mainly impact the social environment and emotional life of the individual (e.g. sense of well-being). Instrumental values are those values that serve as means to achieve terminal values (e.g. impressing others). Eventually, terminal values are deep-set, unconscious objectives a consumer seeks to achieve (e.g. social acceptance). In our case, although certain superficial reasons might explain anabolic supplement consumption at first, the means-end chain theory suggests that every purchase decision is rooted in higher, less tangible objectives of the individual.

2.2. Population and Sample

Past research suggests that anabolic supplements are mainly consumed by young males aged 18 – 30. Hence, we choose this consumer group as the population of our study.

Like Atkinson [19], in this study we used the snowball-sampling method. Requests for interview participation were sent through email lists of several universities in the greater Stuttgart and Hamburg areas (Germany). Through participants who were recruited through those emails directly, further participants were contacted. In order to gain meaningful results, Reynolds et al. [24] recommend a sample size of at least 20 participants when using the means-end chain analysis. Eventually, we achieved a sample size of 21 participants, which meets the above mentioned criterion. The authors conducted the interviews between April and May 2012. All participants were male, single, German citizens, practiced resistance sports and consumed protein-based anabolic supplements. A large ratio also practiced endurance sports (76.19%). As the most important source of information about anabolic supplements, the participants named the internet (76.19%) and the circle of acquaintances (81.9%).

All participants were either college graduates or students (two thirds of the participants being between 24 and 28 years old). Eight of the participants were soldiers of the German Armed Forces, which seems to confirm the growing usage of dietary supplements among military personnel [25]. The

resulting sample appropriately captures an important part of the target group, although the findings cannot be generalized as it is customary for exploratory research designs.

2.3. Data Collection

For the purpose of data collection we used the so called laddering technique, which is the usual method to empirically uncover means-end chains of consumers. First, each participant is asked for product attributes he or she perceives as relevant for his or her purchase decision of a certain product. This is followed by a sequence of “why is this important to you?”-questions in order to prompt the participant to express the consequences and values he or she links to a particular attribute [26]. The questioning ends when either a logical chain from attribute to value is observable or until no further relevant answers can be gathered.

This study in particular used online laddering, i.e., the interviews were conducted through digital real-time discussion tools – commonly referred to as “chats” [27]. In this study, we used the chat function within the social networking site Facebook in order to access the target group (young males) more easily.

The interviews began with surveying the participants' basic socio-demographic background. This includes age, gender, nationality, marital status, educational background, occupation and information with regards to type and intensity of sports activity, consume of anabolic supplements as well as information sources used in that respect. This step was followed by the introductory statement of the interviewer [28] through which participants were introduced to purpose and background of the study. Also, the introduction contained an explanation of the laddering technique and an affidavit with regards to the anonymity of the collected data. Laddering per se began after the introduction. Participants were asked for attributes of anabolic supplements they use. If the participants couldn't name a sufficient number of attributes, they were offered suggestions, such as simple preparation, low fat, simple usage, service life, etc.[28]. The collection of relevant product attributes was followed by the actual laddering. The higher a participant “climbed” his or her ladder during the interview, the more sensible the questions tended to get. It therefore made sense to use special question techniques in order to put the conversation in a relaxed environment [29]. This included third person questioning (i.e. the participant was asked how a third person would most likely answer the given question) and the revelation of (mostly fake) personal details of the interviewer in order to signal social acceptability of supposedly intimate answers. The interview was finished once the participant lacked further answers or simply because the end of the ladder had been reached regarding all product attributes [28].

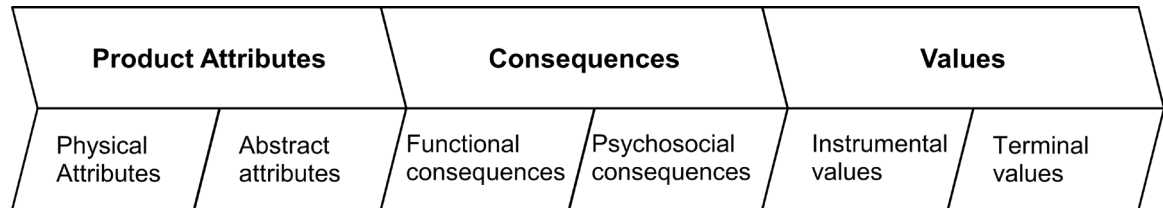


Figure 1. Elements of Means-End Chains

Table 1. Categories in our study

	Category	Coding
Physical attributes	Concentration of nutrients	A1
	Quality of nutrients	A2
	Cheap source of nutrients	A3
	Low fat	A4
	Longer shelf-life	A5
	Better taste	A6
Abstract attributes	Substitution of nutrition	A7
	Quick preparation	A8
	Easy usage	A9
	Easy storage	A10
	Better control of calorie intake	A11
	Functional consequences	Save time and money
Better muscle building		C2
Effective training		C3
Shape body		C4
Improve or keep level of fitness		C5
Low body fat		C6
Balanced diet		C7
Better muscle regeneration		C8
Psychosocial consequences	Improve appearance	C9
	Better sports performance	C10
	Feel good	C11
	Increase attractiveness towards women	C12
	Avoid medical condition	C13
	Better esprit	C14
	Meet requirements of being a soldier	C15
Instrumental values	Economical use of resources	V1
	Health	V2
	Success	V3
Terminal values	Appreciation	V4
	Enjoyment	V5
	Quality of life	V6
	Self-confidence	V7

2.4. Data Analysis

Data analysis began with filtering the participants' individual ladders out the raw interviews. For this purpose, the interviews were reduced to their "chunks of meaning", which then were subsumed under a label. These labels are called "elements". Consequently, all individual interviews were eventually reduced to cognitively linked elements (= ladders). The elements of the entire sample were aggregated to "categories" which then were assigned to one of the six aforementioned layers of the means-end chain. In order to reduce the initial high number of categories to a manageable yet significant number, we used a cut-off-level of 20% [26]. Hence, in our study a category had to be mentioned at least five times across the sample in order to be regarded in the analysis. Overall, 33 categories above the cut-off could be determined. Table 1 shows the allocation of these categories to the individual layers of the means-end chain. In order to ensure reliability of the content analysis, it was double-checked by an independent third party.

In the next step we constructed the so called "implication matrix" [29]. The implication matrix shows the number of direct and indirect connections between the categories within the sample. "Connections" in this regard refers to direct (f.e. "easy preparation" → "save time") and indirect (f.e. "easy preparation" → "quick consumption" → "save time") semantic connections between two categories that occurred through the laddering interviews. These connections are presented as decimal numbers where direct connections are on the left and indirect connections are on the right side of the period (Table 2). Between the 33 categories, 528 types of direct and the same amount of indirect connections were hypothetically possible. Among these, our analysis showed 133 direct and 164 indirect connections. A cut-off level of four or more connections was used to assure a manageable amount of data. This follows the instructions given by Reynolds/Gutman [29]. Overall, 23 direct and 20 indirect connections are significant, i.e. above the cut-offlevel. These numbers overlap sometimes as there are categories which have a large number of direct and indirect connections to another category. On the whole, 41 types of connections above the cut-off were found (direct, indirect or both). The implication matrix as shown in Table 2 displays all 33 categories on both axes. The fields contain the number of direct and indirect connections between categories using the aforementioned decimal number system. Connections above the cut-off level are highlighted (bold).

Using the data provided by the implication matrix, we constructed the "hierarchy-value-map" (HVM). It shows all direct and indirect connections between categories, i.e. all ladders of the sample aggregated in a single picture and

therefore constitutes the outcome of this study (see section 3). Figure 2 summarizes the empirical process we used in our study.

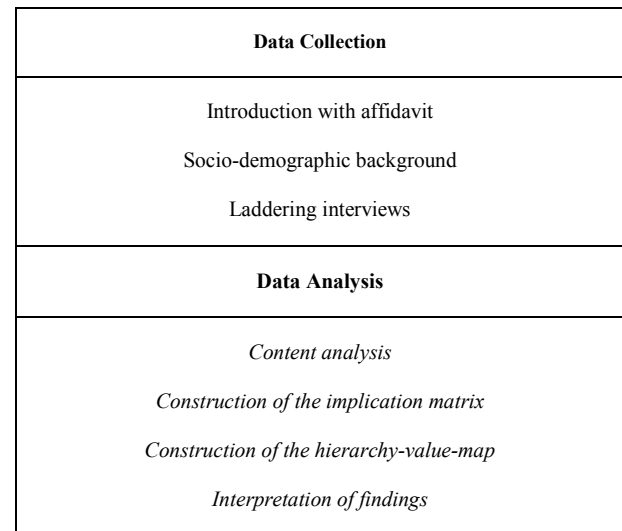


Figure 2. Empirical process in our study

3. Results

The hierarchy-value-map represents the collective pattern of thought of the entire sample and therefore marks the outcome of the empirical analysis (the complex construction process is explained in detail by Reynolds/Gutman[29]). In order to retain clarity, connections between categories within the HVM (i.e. across the entire sample) are called "chains", whereas connections between elements/categories of individuals are still called "ladder(s)".

Figure 3 shows the hierarchy-value-map. The frequency of categories (frame) refers to the number of times they were mentioned within the sample. The frequency of connections (arrow) refers to the number of connections (direct and indirect) between the elements within the sample. The grey and white layers represent the hierarchical levels of the means-end chain, i.e. (from bottom to top) physical attributes, abstract attributes, functional consequences, psychosocial consequences, instrumental values and terminal values. The numbers next to the paths show the accumulated count of direct and indirect connections between the categories. Dominant paths within the HVM, i.e. chains with the highest accumulated number of (direct or indirect) connections between their categories, represent the most likely explanations for the consumer behavior under investigation and are the basis upon which interpretation of the outcome is conducted.

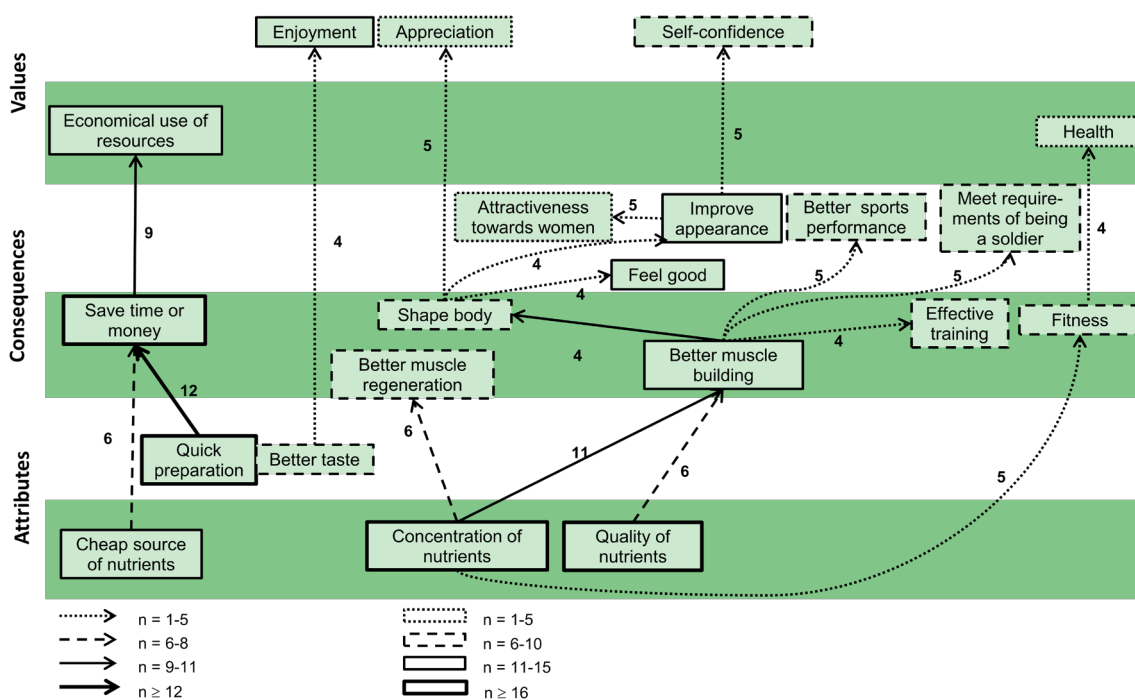


Figure 3. Hierarchical Value Map (dominant paths only)

At the attribute level, the economically-driven motives “quick preparation” and “cheap source of nutrients” as well as the product-based attributes “concentration of nutrients”, “quality of nutrients” and “low fat” are prevalent. Although “better taste” and “enjoyment” form an independent chain with an accumulated four connections, this chain is not very strong compared to the other chains and therefore will not be evaluated further. Typically, the desired consequences of economically-driven attributes are saving time or money, while product-based attributes primarily aim at “better muscle building”. This functional consequence has a pivotal position within the HVM and moderates a majority of chains within this cluster between the attributes and value-layer. “Better muscle regeneration” is a less significant consequence. The same applies for “improve or keep level of fitness“, which is connected with the value „health“. By improving their muscle building using anabolic supplements, the participants are driven by goals that regard their performance or appearance. In terms of performance, two tendencies could be observed: some participants aim at a better performance at their sport (mostly within their sports team); on the other hand, seven participants aim at a better performance within their job as soldiers (as mentioned in 2.2, out of 21 participants eight were soldiers of the German Armed Forces, seven of which named this particular intention). Several motives within the sample are connected with “better sports performance”, none of which is above the cut-off. With regards to appearance, nearly half of the participants want to shape their body. The underlying value is “appreciation”. However, some participants claim this is important in order for them to feel comfortable with

themselves. Consequence “improve appearance” was named by twelve participants. However, there are only four direct connections to “shape body”. Through that consequence, many participants want to improve their attractiveness towards women; likewise, the value “self-confidence” does apply.

4. Discussion and Conclusion

Using the HVM and buying motives above the cut-off, it is possible to determine which motives for buying anabolic supplements are significant. The economical motive plays a significant role within the sample as 19 out of 21 participants said they want to save time or money by using anabolic supplements. Additionally, 13 of these consider this a general means of economical use of resources since they are able to spend time or money on other (supposedly more important) things or because they are able to generate good value for money. According to the participants, time is primarily saved through quick preparation.

Participant 19: „Well, let’s say I return from a workout and want to provide my muscles with protein, which they need for regeneration. I simply take the shake, put water in it, shake it and just drink it.”

Some participants intend to save money through anabolic supplement consumption since they consider protein intake through a conventional diet as too expensive. It should be noted that no past study has regarded the economical aspect of the consumer decision in this field. However, according to the data within this study, it can be assumed that the

economical motive is actually a strong buying motive for recreational athletes in the field of anabolic supplements.

Like in the study conducted by Mason/Scammon [20], the medium range motive “prestige/appreciation” plays an important role in this study. The shaped body is a means of earning appreciation in the social environment.

Participant 8: *„It [shaped body] provides me with reassurance. Be it either that women compliment me or that I simply feel better – without disregarding my health of course.”*

Ten participants strive for appreciation, social acknowledgement or respect of their peers. Self-confidence on the other hand was named by eight participants – primarily as a result of their improved appearance. Therefore, the motive “prestige/expression/appreciation” is a likely buying motive in that matter.

The medium range motive “social conformity” expresses the pursuit of being part of or conform to a certain (social) group. Mason/Scammon [20] found a certain corporate feeling among supplement users. However, this motive can only be found remotely. In our study, only one participant (Participant 1) referred to the aforementioned corporate feeling. Other participants want to improve their performance in order to meet the expectations of their sports team or staff. This pursuit was summed up under the psychosocial consequence “better sports performance” and was mentioned by six participants. As a consequence, this category might be a relevant motive for recreational athletes who are a part of a sports team. However, it can hardly be generalized since this study does not exclusively take team sports into account.

Interviewer: *„Okay, so you’re doing it primarily for yourself?”*

Participant 9: *„Yes and because of the expectations of my sports team and coaches.”*

With regards to the motive zest/excitement/curiosity, Atkinson was able to find remote relevance for anabolic supplement consumption [19]. However, there was no evidence found in the context of our research.

The motive “sex/eroticism” hasn’t been covered in past studies. However, many participants in the context of this study want to improve their appearance in order to increase their attractiveness towards women or to increase the likelihood of sexual intercourse with them. This pursuit was summed up under the psychosocial consequence “increase attractiveness towards women”. In the HVM, it is directly connected to the consequence “improve appearance” and was named by 9 participants. The correspondent chain has an accumulated 24 connections and is therefore one of the most significant chains. Consequently, sex/eroticism is a likely buying motive of young recreational athletes for anabolic supplements.

Participant 7: *„Well, of course I have the consequences of a good appearance in mind: Be more attractive towards women [...] I like interaction with women and I want to have sex with them, because it is*

a pleasure.”

Past studies did not uncover the medium range motive “fear/risk awareness”. In the context of this study, participants were asked whether they believe in the promised effects of the anabolic supplements they consumed. Although some participants firmly believed in the promised effects, there was a strong tendency that anabolic supplements were perceived as sheer “placebos” or hardly effective. Therefore it can be assumed that most participants are not certain about the effects of the anabolic supplements they consume. Moreover, it is likely that many of them believe they do not train as effectively as possible without the consumption of anabolic supplements. Eight participants named anabolic supplements as means to optimize their training. Consequently, it is a likely buying motive.

Interviewer: *„How does this placebo effect work?”*

Participant 13: *„The effect works in a way that supplement intake BEFORE training changes my perception of the training experience. I feel capable of training harder and more motivated than without supplement consumption.”*

Past studies could find only a remote connection of anabolic supplement consumption and the motive “consistency/dissonance/conflict”. The same applies for this study, since only little evidence was found in terms of the resolution of intra-personal conflicts. Hence, no significance of this buying motive was found.

Participant 13: *„An athlete deals with a dilemma. On the one hand, a certain calorie intake is necessary in order to gain muscles. On the other hand, too many calories result in higher body fat, which cannot be the goal. Nutritional supplements contribute to the resolution of this dilemma since calories are exactly measurable.”*

In conclusion, in our study we could identify several likely buying motives of young male recreational athletes for anabolic supplements:

1. Young male recreational athletes consume anabolic supplements in order to achieve an economical use of resources.
2. One ultimate goal of anabolic supplement consumption among this group is earning appreciation among their peers.
3. Sex/eroticism is one deep-set motive of anabolic supplement consumption by young male recreational athletes.
4. Another important motive for the use of anabolic supplements is reducing the risk of inefficient or unsuccessful training.
5. Young male recreational athletes who are part of sports teams consume anabolic supplements in order to conform to expectations of their teammates or coaches.

The outcome of this study has already been limited through its goal and sample. It only represents young male recreational athletes from Germany with regards to anabolic supplements. On the other hand, representing the entire

population of Germany with regards to all possible supplements was not the goal of this research. It was rather intended to make a contribution to close a research gap in this matter.

It is important to understand that we used an exploratory, qualitative approach. Qualitative research aims at generating first insights and at finding hypotheses in insufficiently researched areas in order to lay a basis for further quantitative research projects [30]. Hence, buying motives which were uncovered in this study should not be misunderstood as hard facts. For this reason, the outcome of this study can't be generalized in terms of the general population. However, our results may serve as a basis for future quantitative research in that matter. Additionally, the outcome of means-end chains can be helpful for generating advertising strategies [31,32].

REFERENCES

- [1] R. Collins, D. Kalman. Effect of Government Regulation on the Evolution of Sports Nutrition, in: M. Greenwood, D. Kalman, J. Antonio (eds.). *Nutritional Supplements in Sports and Exercise*, Humana Press, Totowa, 2008, 3-32.
- [2] M. DesJardins. Supplement Use in the Adolescent Athlete, *Current Sports Medicine Reports*, Vol.1, No.6, 369-373.
- [3] A. Jeukendrup, M. Gleeson. *Sport Nutrition: An Introduction to Energy Production and Performance*, 2nd edition, Human Kinetics Publishers, Champaign, 2010.
- [4] D. Mottram. Supplement Use in Sports, in: D. Mottram (ed.), *Drugs in Sports*, 5th edition, Routledge, New York, 2011, 262-273.
- [5] P. Coppens, M. Fernandes da Silva, S. Pettman. European Regulations on Nutraceuticals, Dietary Supplements and Functional Foods: A Framework Based on Safety, *Toxicology*, Vol.221, No.1, 59-74.
- [6] R. Maughan, F. Depiesse, H. Geyer. The Use of Dietary Supplements by Athletes, *Journal of Sports Sciences*, Vol.25, Suppl.1, 103-113.
- [7] J. Lombardo. Supplements and Athletes, *Southern medical Journal*, Vol.97, No.9, 877-879.
- [8] K. G. Grunert, S. C. Grunert. Measuring Subjective Meaning Structures by the Laddering Method: Theoretical Considerations and Methodological Problems, *International Journal of Research in Marketing*, Vol.12, No.3, 209-225.
- [9] R. G. D'Andrade. Schemas and Motivation, in: R. D'Andrade, C. Strauss (eds.), *Human Motives and Cultural Models*, Cambridge University Press, Cambridge, 1992, 23-44.
- [10] E. Arnould, L. Price, G. Zinkan. *Consumers*, 2nd edition, McGraw-Hill, New York, 2004.
- [11] V. Trommsdorff, T. Teichert. *Konsumentenverhalten*, 8th edition, Kohlhammer, Stuttgart, 2011.
- [12] A. Bianco, C. Mammaia, A. Paoli, M. Bellafiore, G. Battaglia, G. Caramazza, A. Palma, M. Jemni. Protein Supplementation in Strength and Conditioning Adeptes: Knowledge, Dietary Behavior and Practice in Palermo, Italy, *Journal of the International Society of Sports Nutrition*, Vol.8, No.25, Online available from <http://www.jissn.com/content/8/1/25>.
- [13] D. El Khoury, S. Antoine-Jonville. Intake of Nutritional Supplements among People Exercising in Gyms in Beirut City, *Journal of Nutrition and Metabolism*, Article ID 703490, Online available from <http://www.hindawi.com/journals/jnme/2012/703490/>.
- [14] J. L. Goston and M. I. Correia. Intake of Nutritional Supplements among People Exercising in Gyms and Influencing Factors, *Nutrition Journal*, Vol.26, No.6, 604-611.
- [15] J. Karimian, P. Esfahani. Supplement Consumption in Body Builder Athletes, *Journal of Research in Medical Sciences*, Vol.16, No.10, 1347-1353.
- [16] K. Froiland, W. Koszewski, J. Hingst, L. Kopecky. Nutritional Supplement Use Among College Athletes and Their Sources of Information, *International Journal of Sport Nutrition and Exercise Metabolism*, Vol.14, 104-120.
- [17] A. Petróczi, D. Naughton. The Age-Gender-Status Profile of High Performing Athletes in the UK Taking Nutritional Supplements: Lessons for the Future, *Journal of the International Society of Sports Nutrition*, Vol.5, No.2, Online available from <http://www.jissn.com/content/pdf/1550-2783-5-2.pdf>.
- [18] V. Mattila et al. Use of Dietary Supplements and Anabolic-Androgenic Steroids among Finnish Adolescents in 1991-2005, *European Journal of Public Health*, Vol.20, No.3, 306-311.
- [19] M. Atkinson. Playing with fire: Masculinity, Health and Sports Supplements, *Sociology of Sports Journal*, Vol. 24, 165-186.
- [20] M. Mason, D. Scammon. Consumers and Nutritional Supplements: Could This be Me? This is Me!, *Advances in Consumer Research*, Vol.26, No.1, 107-112.
- [21] J. Olson, T. J. Reynolds. The Means-End Approach to Understanding Consumer Decision Making, in: T. J. Reynolds, J. Olson (eds.). *Understanding Consumer Decision Making: the Means-End Approach to Marketing and Advertising Strategy*, Lawrence Erlbaum Associates, Mahwah, NJ, 2001, 3-24.
- [22] E. Arnould, L. Price, G. Zinkan. *Consumers*, 2nd edition, McGraw-Hill, New York, 2004.
- [23] J. Olson, T. J. Reynolds. Understanding Consumer's Cognitive Structures: Implications for Advertising Strategy, in: L. Percy, A. Woodside (eds.), *Advertising and Consumer Psychology*, Lexington Books, Lexington, MA, 1983, 77-90.
- [24] T. J. Reynolds, D. Whitlark, D. Wirthlin. Effectively Translating In-Depth Consumer Understanding into Communications Strategy and Advertising Practice, in: T. J. Reynolds, J. Olson (eds.). *Understanding Consumer Decision Making: the Means-End Approach to Marketing and Advertising Strategy*, Lawrence Erlbaum Associates, Mahwah, NJ, 2001, 215-246.
- [25] R. J. Maughan. Quality Assurance Issues in the Use of Dietary Supplements, with Special Reference to Protein Supplements, *The Journal of Nutrition*, Vol.143, No.11,

- 1843S-1847S.
- [26] C. Corbridge, G. Rugg, N.P. Major, N.R. Shadbolt, A.M. Burton. Laddering: Technique and Tool Use in Knowledge Acquisition, *Knowledge Acquisition*, Vol.6, No.3, 315-341.
- [27] T. Gruber, I. Szmigin, A. Reppel, R. Voss. Designing Online Laddering Studies, in: C. Nunes Silva (ed.). *Online Research Methods in Urban and Planning Studies: Design and Outcomes*, IGI Global, Hershey, PA, 193-215, 2012.
- [28] K. Grunert, S. Beckmann, E. Sorensen. Means-End Chains and Laddering: An inventory of Problems and an Agenda for Research, in: T. J. Reynolds, J. Olson (eds.). *Understanding Consumer Decision Making: the Means-End Approach to Marketing and Advertising Strategy*, Lawrence Erlbaum Associates, Mahwah, NJ, 2001, 63-90.
- [29] T. J. Reynolds, J. Gutman. Laddering Theory. Method, Analysis and Interpretation, *Journal of Advertising Research*, Vol.28, No.1, 11-31.
- [30] N. K. Malhotra. *Marketing Research. An Applied Orientation*, 5th ed., Pearson Education, Upper Saddle River, NJ, 2007
- [31] T. J. Reynolds, A.B. Craddock. The Application of the MECCAS Model to the Development and Assessment of Advertising Strategy: A Case Study, *Journal of Advertising Research*, Vol.28, No.2, 43-54.
- [32] J. Vannoppen, W. Verbeke, G. Van Huylbroeck. Consumer Value Structures Towards Supermarket versus Farm Shop Purchase of Apples from Integrated Production in Belgium, *British Food Journal*, Vol.104, No.10, 828-844.