ERASMUS UNIVERSITEIT ROTTERDAM

Erasmus
School of
Economics

INVESTIGATING THE EFFECT OF SELF-REPORTED INSTAGRAM ADDICITON ON CONSUMER BEHAVIOR

Name student   Mark Mijnsbergen
Student number   431281

Supervisor   R. Karpienko
Second assessor   S.L. Malek

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Erasmus School of Economics, Erasmus University Rotterdam

Abstract

This research investigates effects on "unrelated areas of consumer behavior, such as impulsiveness, buying high signaling products, brand preference, the difference in plannend and actual behavior, budget planning and student loan debt". A survey among students in the Netherlands is done to test this. Instagram addiction has a significant effect on impulsiveness and product signaling, but there is no significant effect on brand preference. Respondents with self-reported Instagram addiction seem to spend more money than planned and have more problems with their monthly budget.

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Introduction

In November 2020, The Dutch Media Authority implemented new rules to limit the advertisements vloggers can make on YouTube ("Verdienmodel vloggers op de schop : producten aanprijzen in ruil voor geld mag niet meer," 2020). Content creators should make it clear to viewers when a video is actually an advertisement. Before this, there were no rules for this social media channel. For other social media sites like Facebook and Instagram rules already existed, but only since 2014 (*DE NEDERLANDSE RECLAME CODE*, 2020). These rules were created because social media marketing can be a very effective way to promote a product or service, especially when someone doesn't know it's an advertisement. These rules can be beneficial to all consumers, but were created particularly with children aged under 13 in mind.

The rules for other social media sites, as said before, have existed for longer. WhatsApp, Facebook and Instagram are even bigger platforms than YouTube in terms of daily users (Van der Veer, Boekee, & Hoekstra, 2020). WhatsApp is popular with all age groups, except for 80+, Facebook is popular in the ages 20 -79 years and Instagram is popular among the youngest age groups, 15 - 19 years and 20-39 years (Van der Veer et al., 2020). The tipping point of changing from Instagram to Facebook in 2020 is between 20 and 21 years. In 2016 52% of Dutch students/high schoolars used Instagram (Van der Veer, Sival, & Van der Meer, 2016). In 2020 this percentage is much higher. Till the age of 27, the percentage of Instagram users is higher than 60% and till 23 years this percentage even exceeds 80%. Instagram is getting more and more popular among students; therefore, more and more students might be addicted to Instagram. As mentioned before, since 2014 there have been rules regarding the promotion of products and services in exchange for compensations on social media (*DE NEDERLANDSE RECLAME CODE*, 2020). Since addicted people can have bad mental health, they might also get easily influenced by their addiction.

In January 2020 Newcom published research results about social media use in the Netherlands (Van der Veer et al., 2020). Newcom is an independent Dutch research company that investigates the use of social media in the Netherlands. They have done so since 2010. In 2020 they published the results of their tenth research with 7000 responses. As said before, younger people, for example students, spend more time on social media. Another interesting finding was that Instagram was most popular in the ages between 15 and 24. This range includes most students.

Problem statement

Human beings can be addicted to many different things. For instance, alcohol addiction has existed for a long time. Internet and social media addiction are relative new addictions. However, the way all these addictions develop is very similar. Different aspects can contribute to addiction. Hirschman discussed different theories namely genetic, social and personality (Hirschman, 1992). This article focusses on drug and alcohol addictions. Since the 1930s, drugs addicts and alcoholics were seen as victims of disease. Previously, they were seen as people with moral or spiritual problems. Nowadays, addiction is viewed as a disease, and addicts will be treated. Firstly, genetic abnormalities are investigated in Hirschman's article. For example, if one or both parents are addicted to alcohol, there is a higher risk that the child might become an alcoholic as well. The second theory discussed in the article is the social theory, which states that there is a difference between ethnic groups in rates of alcoholism. If alcohol is normal and more of a social activity, the rate of alcoholics is higher in that specific ethnic group. Drug addicts usually learns about the drugs from more experienced persons in their social group. The third theory about getting addicted is the personality theory. This theory states that there are two personality subtypes among drug and alcohol addicts. The first one uses drugs or alcohol to feel less depressed and the second uses alcohol as a reward.

Once addicted it's very hard to stop using the product or habit. Four brain circuits are most relevant for addiction; reward, motivation, conditioning and inhibitory control (Volkow, Wang, Fowler, Tomasi, & Telang, 2011). Dopamine is an important factor in these four circuits. When a drug is taken, the level of dopamine will increase which will feel as a reward for taking the drugs. With addicts, even if the drug has not been taken yet, dopamine can already increase the need for a drug if someone is triggered with conditioned cues. Because of dopamine the motivation to take the drug will maintain. The improper regulation by dopamine in addicts can be a reason that the motivation to take drugs will increase and they will lose control over the drug in-take. Their self-control will be lower and they will more and more motivated to obtain and take the drugs.

Academic Relevance

Currently, not a lot of articles deal with the influences of Instagram on the life of university students. Most of the articles about social media addiction focus on students who have an addiction to Facebook. Compared to Facebook, Instagram is a relatively new social media platform. Instagram launched in 2010 and has become more and more popular in the Netherlands in the last couple of years. In 2016, 6 years after its launch, 2,1 million Dutch people used Instagram. Nowadays, this number is 5.6 million, including 2.7 million people who use Instagram on a daily basis. Especially ages 15 to 19 and 20 to 39 use Instagram. This social media platform is especially popular with young people and university students, where Facebook has become the social media page for older ages.

A lot of research has already focused on Facebook addictions among students. In previous research, activities that can lead to addiction for students have been identified (Sofiah S.Z., Omar, Bolong, & Osman, 2011). They found some significant relationships between some motives to use Facebook, namely social interaction, passing time, entertainment, companionship and communication, and Facebook addiction. They concluded that Facebook addiction is a growing concern, because it seems to be the ultimate isolating technology that further reduces participation in activities in the real world. Nowadays in the Netherlands, Instagram is growing really fast, and Instagram addiction could be as big of a problem as it is with Facebook. Especially with the COVID-19 pandemic, which causes online communication to be the only option for social interaction. However, this could lead to a lot more social media addicts when the pandemic is over. The issue is that Facebook also has a practical use. Previous research showed some examples where universities use Facebook for academic purposes (Zaremohzzabieh, Samah, Omar, Bolong, & Akhtar, 2014). They use it to spread news or connect alumni. Students think that the use of social media sites like Facebook is vital to obtain knowledge, social acceptance and support.

Instagram can be used for some of the purposes mentioned above as well. It probably won't help with connecting graduates. However, it can be helpful for social interaction and social acceptance. That's why this social media channel is growing quickly in the Netherlands as well. But even if Instagram can be a helpful tool, it will be a problem if a lot of students get addicted to Instagram. This can be an issue for mental health, as well for their economic situation.

Theory

Literature review

Addiction is a very broad term and it is hard to give an exact definition. As Sinnott-armstrong & Pickard (2013) say, the problem is that there are a lot of different forms. They give the following definition for addiction; "Addiction is a strong and habitual want that significantly reduces control and leads to significant harm. " (Sinnott-armstrong & Pickard, 2013, p.862) Addicts will have a habit and might not think about what it can do for their mental and physical health. When the addict realizes it's a bad habit, he won't be able to stop this very easily, because he lost the control over it and thus the ability to stop.

A distinction is made between substance addiction and behavioral addiction. Substance addiction is a desire to keep taking a drug, for example alcohol, even if it leads to a significant harm (Zou et al., 2017). Behavioral addiction is similar to substance addiction, but it doesn't involve taking in a drug. It is an action someone performs, which can lead to a significant harm. Examples for this addiction are internet addiction or social media addiction.

Instagram addiction is a part of social media addiction. There are a lot of social media sites someone can get addicted to. As said before, Instagram is still getting more popular in the Netherlands, especially among young people. Since the social media site is still growing, more people can develop an addiction as well. The amount of users and the amount of daily users have risen with the same percentage from 2019 to 2020 (Van der Veer et al., 2020). This shows that more users means more daily users which can mean more Instagram addicts as well.

There are a lot of similarities between substance addiction, like drug addiction and alcoholism, and behavioral addiction (Grant, Potenza, Weinstein, & Gorelick, 2010). Behavioral addictions include, for example, gambling, gaming and internet addiction. internet addiction, which includes social media addiction, and thus Instagram addiction as well. A similarity between both kinds of addiction is that the most important feature is the failure to resist an impulse, drive and/or temptation. Addicts have the urge to recur in their habit. That can be checking Instagram a couple times per hour or gaming many hours a day. Substance addicts have this urge as well to use their drink or drugs. Other similarities are natural history, tolerance, overlapping genetic contribution, neurobiological treatments and response to treatment.

Since both types of addiction are really similar, Instagram addiction can work in the same way as described by Hirschman (1992) and Volkow et al. (2011). Someone has a higher possibility to become an alcohol addict if the parents are alcoholics or to becomes a drug addict when people around him are drug users or even addicts as well. Instagram is much more accessible than drugs or alcohol. Especially at a young age. Nowadays a lot of people are on Instagram and other social media. Since Instagram is really popular, to fit in you should have an Instagram account. And especially with the COVID-19 pandemic, it is the best way to know how your friends are doing. However, Instagram can be addictive as well. It is possible to like a picture that is posted on Instagram. However, when you're addicted and receive likes on your post, it feels like each like is a reward. With each like, this reward will increase. As mentioned before, dopamine will increase with these rewards, but it will also be a motivation to keep posting pictures on Instagram (Volkow et al., 2011). If this happens, someone will be addicted to Instagram.

Conceptual framework and hypotheses

According to previous studies there is a correlation between impulsiveness and some kinds of addiction (Cao, Su, Liu, & Gao, 2007), for example for gambling and alcohol. It has been found that there could be some differences for males and females regarding the relation between impulsiveness and addiction (Barnes, Welte, Hoffman, & Dintcheff, 2005). Impulsiveness was a significant predictor for alcohol addiction for females, but for males it was a predictor for delinquency. Impulsiveness is not unusual in combination with behavioral addictions as well. People with internet addiction can have lower impulse control (Dong, Lu, Zhou, & Zhao, 2010). Since Instagram is an online social media channel, these findings might also be applicable. If people have lower impulse control they could be more prone to impulse buying. Dong et al. showed the connection between impulsiveness and internet addiction. They do not show if this connection also applies to social media addiction, or more specifically Instagram addiction.

Research has identified four kinds of impulse buying (Stern, 1962). The four types are: planned impulse buying, reminded impulse buying, suggestion impulse buying and pure impulse buying. The first type of impulse buying has the least impulsiveness, the last has the most. Planned impulse buying means that a consumer is going to a shop, knowing what kind of product to buy, but not, for example, of which specific brand they want to buy a product. Reminded impulse buying means that the consumer is already in the shop, sees a product and remembers that he is in need for the product. Suggestion impulse buying is similar to reminded impulse buyer, but the consumer sees the product for the first time. When a consumer sees the product, at that time they must decide to buy it or not. The last type, pure impulse buying, is when a consumer purchases a product without initially planning to buy this product at all. For example, getting a candy bar at the cash register. Usually the consumer wouldn't buy this product.

Hypothesis 1; **Students with high reported Instagram addiction, compared to students with low reported Instagram addiction, are more impulsive.**

Although literature shows that addicts spend more money, for example with impulsive buying, this might not be the case with Instagram addicts. Research shows that posting products on social media can result in less purchase intentions (Grewal, Stephen, & Coleman, 2019). They did five studies where they found that consumers, who post identity-relevant products on their social media page had a decreased interest in purchasing those items. Identity-relevant products are products that tells something about the consumer. For example that the customer is wealthy or that the customers cares about others. However, this is not the case when a consumer posts a product that is not identity-relevant. With identity-relevant products, posting them on social media would cause a decrease in the intention for consumers to buy the product, which can result in less buying than the consumer thought he would make.

Hypothesis 2; **Students with high reported Instagram addiction plan to spend more money than they actually do.**

Instagram addicted students might spend their money on different, perhaps more expensive, products than other students do. People like to share their life on Instagram. They want to show what they are doing or what clothes they are wearing. This is to impress their followers and get as much likes as possible. Previous studies showed that there is a significant positive relationship between the effect of likes and problematic internet use (PIU) (Martinez-pecino & Garcia-gavila, 2019). This is because likes can be seen as a reward. According to that research, the effect of likes will be similar to the problematic use of social network sites (SNS). This means that people that see likes as a big reward, will do more to get these likes. To do this, people may choose to wear designer clothes to look even better. Those clothes are generally more expensive than clothes without the logo of the designer. Wearing these clothes shows to their followers that they are able to buy these kinds of products, which might impress their followers more.

Han, Nunes, & Drèze (2010) divided consumers into four different categories. The first group buys expensive products from luxury brands and doesn't necessarily want to impress other groups. A second group that buys expensive products as well, but wants to impress the other groups. The third group wants to impress other groups as well, but buys counterfeit products, which are cheaper. The fourth group doesn't want to impress others and therefore doesn't buy expensive and luxury brands. Instagram addicted people get a rush from likes and to get more likes they can post pictures to impress others, and therefore might spend more money.

Hypothesis 3; **Students with high reported Instagram addiction, compared to students with low reported Instagram addiction, spend more money on products with high status and high signaling.**

Where the latter hypothesis was about students who buy more expensive products, just to impress others on Instagram, students can also buy products or brands because they appear on Instagram often. There are five ways a brand can create value to their brand equity (Aaker, 1992). These are: brand loyalty, brand awareness, perceived brand quality, brand associations in addition to perceived quality and other proprietary brand assets. Instagram can be helpful in creating value with some of these assets. Especially brand name awareness can be created through Instagram, since it's a very easy way to promote a brand's products or services. Also, brand preference can increase if Instagram users follow their favorite brand.

Instagram addicted consumers look at Instagram more often than other students and may see these advertisements more. The effect of Instagram advertisements on brand awareness and preference to the brand of these students could therefore be bigger. A result of an experiment done by D'Souza & Rao (1995) showed there was strong evidence that advertising repetition caused more preference for specific brands. For example, Nike is a really big brand on Instagram. They reach a lot of people, not just through advertisements but also through regular posts of Nike itself or posts from people wearing their products. The recurrence will make the possibility that the product will be bought even bigger. That's why students who are addicted to Instagram might spend more money on popular Instagram brands. They see them more often, thus might buy more products of the same brand.

Hypothesis 4; **Students with high reported Instagram addiction, compared to students with low reported Instagram addiction, have higher brand preference.**

The previous hypotheses were all about spending money. Students with a self-reported Instagram addiction might spend more money on for example designer products. It's possible students get more in debt, because of higher spending. Before 2015, students from the Netherlands received monthly payments from the Dutch government when they were studying an academic or a college education ("Oud stelsel hbo en universiteit," n.d.). If the students finished a degree in 10 years, the payments were considered a gift. Otherwise their debt had to be paid back. Since 2015, this system of gifts has been changed ("Het leenstelsel," n.d.). Now students only can loan money, which has to be paid back in 35 years after graduation. Since 2015, the amount of loan debt students have has risen very quickly ("Studenten lenen vaker en meer," 2019). Because of this, it is difficult to compare the amounts of debts, with earlier years. However, it is possible to see if students with Instagram addiction have higher debts than students without this addiction.

Hypothesis 5; **Students with high reported Instagram addiction, compared to students with low reported Instagram addiction, have higher student loan debts.**

Method

Procedure

The information to test those hypotheses will be collected from a survey among students in the Netherlands. Since this study is about students, it won't make a difference that the survey will only be available online only. The advantage of an online survey is that it is easy to reach a lot of respondents. This will be done through, among other things, online platforms where students share their survey and other platforms to reach as many students in the Netherlands as possible. The survey can be spread around social media as well, since that is where students with a possible Instagram addiction can be found. The items of the survey are be presented in table 1.

Table 1. Survey design

Belongs to hypothesis …	Theoretical construct and literature review	Questions
All	Questions to identify if a respondent is addicted to Instagram addiction (Van den Eijnden, Lemmens, & Valkenburg, 2016) .	During the past year, have you… 1) regularly found that you can't think of anything else but the moment that you will be able to use Instagram again? 2) regularly felt dissatisfied because you wanted to spend more time on Instagram? 3) often felt bad when you could not use Instagram? 4) tried to spend less time on Instagram, but failed? 5) regularly neglected other activities (e.g. hobbies, sport) because you wanted to use Instagram? 6) regularly had arguments with others because of your Instagram use? 7) regularly lied to your parents or friends about the amount of time you spend on Instagram? 8) often used Instagram to escape from negative feelings? 9) had serious conflict with your parents, brother(s) or sister(s) because of your Instagram use?
-	General questions	Do you agree with the following statements? 1) I find it important what friends on Instagram think of me. 2) Pictures I post make my life look better than it is. 3) I take into account what others might think of my picture or video before I post it.

H1	Questions for impulsiveness (Rook & Fisher, 1995)	Do you agree with the following statements? 1) I often buy things spontaneously. 2) "Just do it" describes the way I buy things. 3) I often buy things without thinking. 4) "I see it, I buy it" describes me. 5) "Buy now, think about it later" describes me. 6) Sometimes I feel like buying things on the spur-of-the-moment. 7) I buy things according to how I feel at the moment. 8) I carefully plan most of my purchases. 9) Sometimes I am a bit reckless about what I buy.
H2	Questions to see actual behavior	Do you agree with the following statements? 1) I often bought things spontaneously in the last week. 2) "Just do it" describes the way I bought things in the last week. 3) I often bought things without thinking in the last week. 4) "I see it, I buy it" described me in the last week. 5) "Buy now, think about it later" described me in the last week. 6) Sometimes I felt like buying things on the spur-of-the-moment in the last week. 7) I bought things according to how I feel at the moment in the last week. 8) I carefully planned most of my purchases in the last week. 9) Sometimes I have been a bit reckless about what I bought in the last week.

H3	Questions about high signaling products	How often are you doing the following?
	Question 1-7 (Krause et al., 2019) Question 8 (Han et al., 2010)	1) You buy certain things that make a good impression on others. 2) You pay more for products to signal your status. 3) You buy certain things that can impress others. 4) You spend money on things that represent an exclusive lifestyle. 5) You spend money on things to set yourself apart from others. 6) You buy certain products to show your success in life. 7) You buy products that some would consider as luxury. 8) You buy fake products that looks like a luxury brand.
H4	Questions about brand preference (Bennett & Rundle-thiele, 2002)	Do you agree with the following statements? 1) I would rather stick with a brand I usually buy than try something I am not very sure of. 2) If I like a brand, I rarely switch from it just to try something different. 3) I rarely introduce new brands and products to my colleagues. 4) I rarely take chances by buying unfamiliar brands, even if it means sacrificing variety. 5) I buy the same brands even if they are only average. 6) I would rather wait for others to try a new brand than try it myself. 7) I would rather stick to well-known brand when purchasing directory advertising (advertising in a specialized directory to drive attention when a customer is looking for the product or service, for example in the phone book).

H5	Questions about budget planning and student loan debt	How often does it happen to you that …
		1) you check your bank account and find that you have spent more than you actually planned.
		2) you saved less money than you originally planned
	Question 1-8 (Krause et al., 2019)	3) you catch yourself thinking that you need to cut on spending money
		4) you try to save money but fail to do so.
	Question 9 ("Studenten lenen vaker en meer," 2019)	5) you have the feeling that you lose control over your spending.
		6) you have problems at the end of the month making ends meet
		7) your budgeting at the end of the month is tight.
		8) you spend more money than you have available.
		What is your student debt?
		1) €0-€10.000
		2) €10.001-€20.000
		3) €20.001-€30.000
		4) €30.001-€40.000
		5) €40.001-€50.000
		6) €50.001-€60.000
		7) €60.001-€70.000
		8) €70.001 or more
		9) Don't know/don't want to say

Measurement of self-reported Instagram addiction

The questions to measure the self-reported Instagram addiction will be based on questions used before in an article about social media disorder (Van den Eijnden et al., 2016). These 9 binary questions are focused on all social media, but since Instagram is the only relevant social media platform in this survey, the questions will focus more on Instagram. Participants will be considered addicted to Instagram if they meet 4 out of 9 questions.

Measurement of impulsiveness

Students with self-reported Instagram addiction might be more impulsive compared to students without self-reported Instagram addiction. Impulsiveness has been proved to be effected by some addiction (Cao et al., 2007; Dong et al., 2010). To measure the effect of Instagram addiction on impulsiveness, 9 statements will be presented on a 5-point Likert scale. This Likert scale range from strongly agree to strongly disagree. These statements have already been used by Rook & Fisher in 1995.

The difference between planned and actual behavior

As mentioned before with hypothesis 2, Instagram addicted consumers might actually spend less (Grewal et al., 2019). This part will investigate if there is a difference between what Instagram addicted consumers think they spend and what they actually spend. Participants have to answer 9 statements on a 5-point Likert scale, ranging from strongly agree to strongly disagree.

Signaling products

The fourth part of the survey will consist of questions to see if Instagram addicted consumers buy products to show off on their Instagram page and impress their followers. This will be done with 7 statements that have been used before by Krause et al. (2019), followed by a question to see in what group, showed by Han et al. (2010), the participant belongs. The answer options will be on a 5-point Likert scale, ranging from always to never.

Brand preference

To test if someone has higher preference to a brand, Bennett & Rundle-thiele (2002) used a 7 items on a 5-point Likert scale, ranging from strongly agree to strongly disagree. The more participants agree to the statements, the more they prefer a brand. The results will be used to see if Instagram addicts have higher or less preference to a brand than those who are not addicted to Instagram.

Measurement of student loan debts

To get more insight into the spending of the participants, questions will be asked about their student loan debt and monthly budget planning. This part of the survey will start with questions about budget planning. These statements will be based on a 5-point Likert scale, already used by Krause et al. (2019). The range of the scale will be from always to never. The last question is a multiple-choice question, asking how much the participant's student loan debt is.

Dependent and independent variables

The goal of this survey was to investigate if Instagram addiction has an effect on a number of consumer behaviors. Thus, Instagram addiction will be the main independent variable. In the survey, 9 questions were asked to find out if someone reported themselves as an Instagram addict. A new variable "Addicted" is computed which shows if someone is addicted or not. Addicted is a binary variable which have the value 1 if someone is a self-reported Instagram addict and 0 if not. A respondent is considered as self-reported Instagram addict, when they meet 4 out of 9 questions about their Instagram use. Other independent variables are age and gender. Two dummy variable are created for gender, namely Female and Other_gender. Other_gender include all except for male and female or respondents who preferred not to tell their gender.

The different consumer behaviors are the dependent variables in this survey. These variables are impulsiveness, actual behavior, product signaling, brand preference, budget planning and student loan debt. These variables are dependent, because it is tested if Instagram addiction has an effect on them. The questions in the survey are reverse coded. A higher value implies, for example, lower impulsiveness or lower brand preference. To make it more clear the values are reversed before a regression analysis is done. This way a higher value means higher impulsiveness and higher brand preference.

Cronbach's alpha

To see if the statements and variables mentioned earlier are reliable and can be combined to measure the different buying behaviors, Cronbach's Alpha is used. Cronbach (1951) used α as a coefficient to see if there is a consistency or reliability in a group of statements. This coefficient can vary between 0 and 1, where higher is better. If the coefficient is close to 1, the internal consistency is really high. The questions in this survey consist of more than one statement. With Cronbach's alpha, the consistency of all statements in a question can be measured. As shown in table 2, the Cronbach's Alpha of most questions is quite high.

Table 2. Cronbach's Alpha for the survey questions

Construct	Cronbach's Alpha	N of items
Impulsiveness	0.824	9
Actual behavior	0.856	9
Product signaling	0.894	8
Brand preference	0.805	7
Budget planning	0.926	8

Principal Component Analysis

Principal component analysis (PCA) is a technique that analyzes observations by several variables, takes the most important information of these variables and makes a set of new, and less, principal components (Abdi & Williams, 2010). It represents if there is a similarity in the variables used in the observations. As seen in table 2, there is internal consistency, thus there could be a pattern of similarities as well. To see if this is the case, the observations will be analyzed with a factor analysis. Factor analysis will reduce a lot of variables into less variables. Each question consists of multiple statements, which are multiple variables. With factor analysis a lot of these variables will be combined into less variables, the principal components.

There are two tests to see if the quality of the factors can be good. The Kaiser-Meyer-Olkin test (KMO) will measure sampling adequacy. The number can vary between 0 and 1. When the result is close to 1, the factor analysis is reliable. With this sample the KMO is 0.896, thus quite reliable. The second test is Bartlett's test of Sphericity. The significance of the factor analysis can be seen here. In this survey the significance for factor analysis is 0,000, which is very good.

The number of factors can be based on the Eigenvalue. The number of factors that should be chosen should have an Eigenvalue of 1 or higher. When this value is lower than 1, it is better to have less factors. Furthermore, a good number of factors is when the component before the Eigenvalue isn't changing a lot anymore. After the factor analysis of this survey, the Eigenvalue almost does not change from 6 factors. Therefore, 5 components seem like a good number of factors.

Statistical technique

The results of the survey will be analyzed with a regression model. A regression model is a model that can be used to analyze the relationship between a dependent and one or more independent variables. The model is used for all hypotheses to see if there is a relationship between Instagram addiction and a number of consumer behaviors. As mentioned before, Instagram addiction is the main independent variable. A regression model can be used for only one dependent variable. Therefore, multiple regressions will be done, to see the effect of Instagram addiction. All regression models are described below.

With hypothesis 1, the effect of Instagram addiction on impulsiveness is tested. The variables gender and age are included in all regression models to see if they, next to addiction, have a significant effect on the dependent variables. Hypothesis 1 is tested using the following regression model:

$$Impulsiveness = \beta0 \pm \beta1 \times Addicted \pm \beta2 \times Female \pm \beta3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

Hypothesis 2 tests if there is a difference in what consumers plan to do and what they have done in the last week. A new variable, named Actual behavior, is computed to see this difference. The factor score of the behavior in the last week is subtracted from the factor score of impulsiveness to compute this new variable. If the result is negative, a consumer actually spends more on impulse buying than they have planned. When the result is positive, a consumer actually spends less on impulse buying than they have planned.

$$Actual\ behavior = \beta 0 \pm \beta 1 \times Addicted \pm \beta 2 \times Female \pm \beta 3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

The third regression model is about hypothesis 3. A regression model is used to see the effect of Instagram addiction on spending money on high signaling products. However, as shown by Han et al. (2010), consumers can buy high signaling products that are fake. Therefore, two regressions are done to test this hypothesis. The first regression tests if Instagram addiction has an effect on buying high signaling products. The second regression tests the effect Instagram addiction has on the willingness to buy counterfeit products instead of the original ones.

$$Signaling = \beta 0 \pm \beta 1 \times Addicted \pm \beta 2 \times Female \pm \beta 3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

$$Counterfeit\ products = \beta 0 \pm \beta 1 \times Addicted \pm \beta 2 \times Female \pm \beta 3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

Hypothesis 4 tests brand preference and how it is effected by Instagram addiction. An Instagram addicted consumer spend more time on Instagram than other consumers and therefore might see their favorite brands more often. To see if this increases brand preference, the following regression is done:

$$Brand\ preference = \beta 0 \pm \beta 1 \times Addicted \pm \beta 2 \times Female \pm \beta 3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

The last hypothesis is about spending money. Two regressions are used to test if Instagram addiction has an effect on consumers spending behavior. The first regression tests if Instagram addiction has an effect on the student loan debt and the second regression test the effect of Instagram addiction on how consumers spend their monthly budget.

$$Student\ loan\ debt = \beta0 \pm \beta1 \times Addicted \pm \beta2 \times Female \pm \beta3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

$$Budget\ planning = \beta0 \pm \beta1 \times Addicted \pm \beta2 \times Female \pm \beta3 \times Other\_gender \pm 4 \times Age \pm \varepsilon$$

Results

Data description

The survey is conducted among students in the Netherlands. It has been completely filled out by 205 respondents. 20 respondents did not finish the survey. These respondents were not included in the analyses. 194 respondents, 94,6%, that completely filled out the survey is student. Most of the students, 61,5%, were student at a university. 36,1% of the respondents was male and 63,4% female. The biggest group of respondents were between 18 and 24 years, namely 81%. As said before, this is the age category where the popularity of Instagram is growing the most.

As mentioned before, Van den Eijnden et al. (2016) said if someone met 5 out of 9 statements, they were considered as addicted. In this survey, this was the case for almost 6.8% of the respondents. If we consider someone as addicted if they met 4 out of 9 statements, this percentage is 10,2%. This means that 21 respondents recorded themselves as Instagram addicted. Out of these respondents, 8 are males, 12 females and 1 preferred not to say their gender. 61,9% of the addicted respondents are in the age group 18 – 24, 33,3% in the age group 25 – 31 and 4,8% is older than 31 years. Since Instagram is most popular in the age group of 18 – 24, it seems logical that most addicted students are in this age group as well. Most of these respondents have been studying for 4 or 5 years, namely 66,7%.

Parameter estimates

In this survey, a distinction is made between two groups. One group consist of respondents who answered with yes 3 or less times on the questions about Instagram use. They are considered non-addicted. The other group consist of respondents who answered yes 4 times or more on the same question. This group of respondents are considered Instagram addicts.

The survey consists of many different variables. To get a better overview a factor analysis was performed. A factor analysis is an analysis which shows which variables measure approximately the same thing and thus can be combined into 1 variable, called a component or factor. The number of factors can be determined in couple of different ways. The first way is to look at the Eigenvalue in SPSS. When the Eigenvalue drops below 1, it won't be much better to improve factor scores by adding another factor. The best number of factors would be the amount before the Eigenvalue drops below 1. Another way to choose the right number of factors is to look at the scree plot. The ideal number of factors is the point before the curve gets flattens. When the curve is (almost) flat, adding a factor won't improve the factor scores that much. A scree plot of this factor analysis can be seen in figure 1. As can be seen in this figure, the curve flattens with 6 components. Since the best number of factors is one before the curve flattens, the right number of components seems to be 5. It would be best if the amount of variables and the number of hypotheses that will be tested are equal. Therefore, 5 factors would be the best amount in this survey as well.
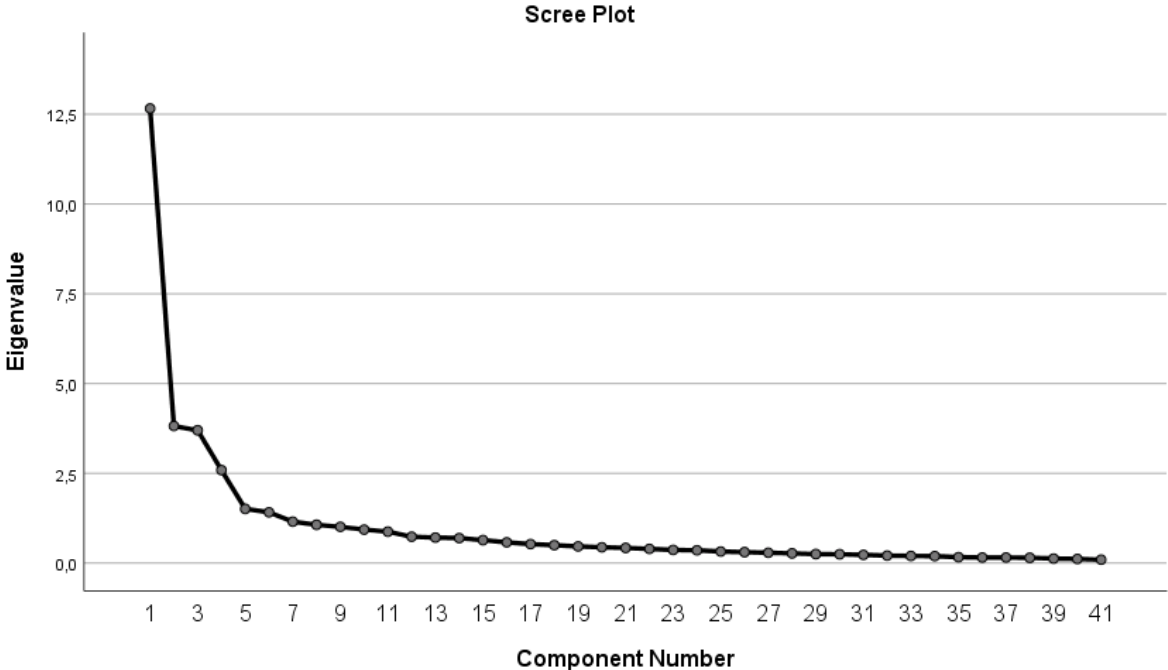
Figure 1. Scree plot factor analysis

This number is equal to the amount of sections in the survey. In the survey five different topics were tested, namely impulsiveness, actual behavior, product signaling, brand performance and monthly budget planning. The general questions to see if someone is Instagram addicted have not been analyzed with a factor analysis. It's not necessary to compute a factor for this variable, since a respondent is considered addicted if they meet 4 out of 9 statements.

However, if one factor analysis is performed, some questions about impulsiveness and impulsiveness last week belong to the same factor score. To create right factor scores for impulsiveness and impulsive behavior last week, this should be separated. Therefore, a factor analysis is done with only impulsiveness questions, to create the correct factor score. The component matrix of this factor analysis is shown in Appendix A. Another factor analysis is done for the remaining variables. As can be seen in table 3, the questions of each other section now belong to the correct components.

Table 3. Rotated component matrix of 4 component factor analysis

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
you have the feeling that you lose control over your spending?	,826*			
you try to save money but fail to do so?	,820*	,260		
you have problems at the end of the month making ends meet?	,811*			
your budgeting at the end of the month is tight?	,791*		,285	
you catch yourself thinking that you need to cut on spending money?	,741*			
you saved less money than you originally planned?	,736*			
you spend more money than you have available?	,733*		,279	
you check your bank account and find that you have spent more than you actually planned?	,663*	,329		
I often bought things spontaneously in the last week.		,841*		
"Just do it" describes the way I bought things in the last week.		,824*		
"I see it, I buy it" described me in the last week.		,819*		
I often bought things without thinking in the last week.		,746*	,270	
Sometimes I have been a bit reckless about what I bought in the last week.	,261	,731*	,296	
Sometimes I felt like buying things on the spur-of-the-moment in the last week.		,697*		
"Buy now, think about it later" described me in the last week.		,679*	,304	
I bought things according to how I feel at the moment in the last week.		,618*		
I carefully planned most of my purchases in the last week.		,303*		
You pay more for products to signal your status.			,838*	
You buy certain products to show your success in life.			,831*	
You spend money on things that represent an exclusive lifestyle.			,810*	
You buy certain things that can impress others.			,809*	
You buy certain things that make a good impression on others.			,712*	
You buy products that some would consider as luxury.			,661*	
You spend money on things to set yourself apart from others.			,624*	
You buy fake products that look like a luxury brand.			,469*	
If I like a brand, I rarely switch from it just to try something different.				,756*
I would rather stick with a brand I usually buy than try something I am not very sure of.				,744*
I would rather wait for others to try a new brand than try it myself.				,730*
I rarely take chances by buying unfamiliar brands even if it means sacrificing variety.				,719*
I would rather stick to well-known brands when purchasing from directory advertising.				,647*
I buy the same brands even if they are only average.				,558*
I rarely introduce new brands and products to my colleagues.				,556*
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

For each of the components of this factor analysis, a regression variable is computed. These regression variables can be used in regression models as dependent variable to see the effect of Instagram addiction on the consumer behaviors.

Impulsiveness

As mentioned before, different types of addictions have a connection with being more impulsive. To see if Instagram addicts are more impulsive as well, a regression analysis is performed. The independent variable in this regression is a dummy variable if someone has an Instagram addiction or not, called Addicted. Other independent variables are age and gender. The dependent variable is the factor score of the questions about impulsiveness. The results of the regression analysis are shown in table 4.

Table 4. Results of the regression analysis of the effect of Instagram addiction on impulsiveness

Coefficients[a]					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-,154	,352		-,439	,661
Addicted	,777	,231	,236	3,361	,001***
Female	,210	,146	,102	1,444	,150
Other_gender	-,205	1,028	-,014	-,199	,842
Age	-,026	,142	-,013	-,183	,855

a. Dependent Variable: Impulsiveness

Note: *p<0,1   **p<0,05   ***p<0,01

The results in table 4 show a positive relationship between addiction and impulsiveness (0,777). This relationship is statistically significant (p<0,01). If respondents fully agreed with the statements, they got value 5. If they fully disagreed the value of that question was 1. Therefore, a higher outcome means more impulsiveness. This means that respondents that reported themselves to be Instagram addicted are more impulsive than respondents without Instagram addiction. Therefore, hypothesis 1 is accepted.

Planned vs. actual behavior

To see if there is a difference between how consumers think they behave and how they actually behave, questions about impulsiveness are used, as well as similar question about what respondents actually did last week. For these questions, two factor scores were created. One factor score for planned impulsiveness and one for actual impulsiveness last week. These two factors are subtracted from each other and computed into a new variable. A new variable, Actual behavior will be the dependent variable in the regression, used to see if Instagram addiction has a significant effect. The formula used to compute the new variable is Factor score impulsiveness - Factor score last week.

Table 5. Results of the regression analysis of the effect of Instagram addiction on actual and planned behavior.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-,255	,307		-,832	,406
	Addicted	,365	,202	,130	1,809	,072*
	Female	,036	,127	,020	,285	,776
	Other_gender	-,480	,897	-,039	-,535	,593
	Age	,089	,124	,053	,717	,474

a. Dependent Variable: Actual behavior

Note: *p<0,1   **p<0,05   ***p<0,01

The relation between Addicted and Actual behavior is positive (0,365). What these results show is that if someone is considered Instagram addicted, they actually bought more products impulsively than planned compared to people who were not addicted to Instagram. The coefficient of Addicted is statistically significant (p<0,1). However, this does not necessarily mean that the difference in actual and planned behavior is bigger with addicts than with non-addicts. The constant in this regression is -0,255, which means it is slightly negative. Students without Instagram addiction plan to do more impulsive buying than they actually do. Students with Instagram addiction plan to buy less impulsive buying than they actually do. However, this constant is not significant so no conclusions can be drawn from this.

Since the variable Addicted is significant and positive, hypothesis 2 will be rejected. Students with a self-reported Instagram addiction, compared to students without self-reported Instagram addiction, more often spend more money than they had planned.

Signaling products

As mentioned before, people might want to show off their lives on Instagram. They post pictures with popular or expensive products to show everyone how great their life is. To test if this is true, a regression analysis is performed. The results of this analysis is shown in table 6.

Table 6. Results of the regression analysis of the effect of Instagram addiction on buying high signaling products

		Coefficients[a]				
		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	,775	,324		2,392	,018**
	Addicted	1,273	,213	,387	5,975	,000***
	Female	-,405	,134	-,195	-3,013	,003***
	Other_gender	1,190	,947	,083	1,256	,210
	Age	-,295	,131	-,151	-2,252	,025**

a. Dependent Variable: Signaling

Note: *p<0,1   **p<0,05   ***p<0,01

The results show a statistically significant positive relation between addiction and buying high signaling products (1,273, p<0,01). This means that respondents with a self-reported Instagram addiction find it important that others know what products they wear. They want to show that they can afford the brands they are wearing.

Other independent variables show a statistically significant relation as well. There is a negative relation between age and buying high signaling products. A higher age means that a consumer attaches lower value to high signaling products. There is a statistically significant negative relation between female and buying high signaling products as well. This means that females attach less value to signaling in products compared to males.

One question in the survey was what respondents think of buying counterfeit products. Buying counterfeit products is a consumer behavior and therefore it is imperative to see if there is significant difference between addicts and non-addicts in buying these counterfeit products. The result of that regression is shown in the following table.

Table 7. Results of the regression analysis of the effect of Instagram addiction on buying counterfeit products.

	Coefficients[a]				
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	1,072	,229		4,682	,000***
Addicted	1,126	,150	,471	7,482	,000***
Female	-,031	,095	-,021	-,327	,744
Other_gender	,511	,669	,049	,764	,446
Age	,073	,093	,051	,786	,433

a. Dependent Variable: Counterfeit products

Note: *p<0,1   **p<0,05   ***p<0,01

The results in table 7 shows that there is a positive and statistically significant relation between Instagram addiction and buying counterfeit products (1,126, p<0,01). This means that students with an Instagram addiction, compared to students without an Instagram addiction, prefer to buy a counterfeit product instead of the original one more often. In conclusion overall, they want to show how great their life is and impress others, but they don't want to pay the higher price for real products. Although the results of this survey show that students with high reported Instagram addiction buy more products with high signaling, the results also show that these students want to buy counterfeit products to spend less money per product. Since students with self-reported Instagram addiction buy counterfeit products instead of the original ones more often than students without Instagram addiction, hypothesis 3 cannot be accepted, nor rejected.

Brand preference

Consumers with a self-reported Instagram addiction spend a lot of time on Instagram. They don't just see other people's post, but Instagram posts of brands as well. They might follow brands they like and therefore see more posts of these brands than consumers who aren't addicted to Instagram. Therefore, a regression analysis is done to test the effect of Instagram addiction on brand preference. The result of this analysis is shown in table 8.

Table 8. Results of the regression analysis of the effect of Instagram addiction on brand preference.

	Coefficients[a]				
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	,719	,359		2,000	,047**
Addicted	,106	,236	,032	,449	,654
Female	-,106	,149	-,051	-,710	,478
Other_gender	1,033	1,050	,072	,984	,326
Age	-,301	,145	-,153	-2,072	,040**
a. Dependent Variable: Brand preference					

Note: *p<0,1   **p<0,05   ***p<0,01

As shown in the results in table 8, addiction has a positive relationship with brand preference (0,106). However, Addicted is not statistically significant (p>0,1). Therefore, it's not possible to say with certainty that consumers with Instagram addiction have more preference to a brand than consumers without Instagram addiction. Hypothesis 4 can't be accepted or rejected.

Age is the only statistically significant variable in this regression. The results show that an older age means lower brand preference. Younger consumers have higher brand preference and therefore buys the same brand more often.

Student loan debts and budget planning

Since 2015, students in the Netherlands can loan money for college instead of receiving it as a gift. Since this reform, students accrue larger amounts of debt. The amount of Instagram users has been growing since 2015 as well. A regression analysis is done to see the effect of Instagram addiction on student loan debt in the Netherlands. The results are shown in table 9. 18 respondents did not want to say what their student loan debt is or do not know their student loan debt. These respondents are excluded from this analysis.

Table 9. Results of the regression analysis of the effect of Instagram addiction on student loan debt.

		Coefficients[a]				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,136	,716		1,585	,115
	Addicted	-,628	,456	-,104	-1,375	,171
	Female	-,077	,286	-,020	-,271	,787
	Other_gender	-1,799	1,930	-,072	-,932	,352
	Age	,573	,293	,153	1,959	,052

a. Dependent Variable: Student loan debt?

Note: *p<0,1   **p<0,05   ***p<0,01

The results show a negative, but no statistically significant relation between addiction and student loan debt (-0,628, p>0,1). Therefore, no conclusions can be drawn from this regression. Hypothesis 5 should be rejected. Students with high reported Instagram addiction do not have higher student loan debts compared to students with low reported Instagram addiction. Age is the only variable that shows a significant relation with student loan debt. This relation is positive, which means that a higher age will have a higher debt. This conclusion seems logical since students at a lower age mostly have been studying for a shorter period.

Younger students have lower loan debts, but might therefore have more problems with their monthly budget planning. To see if there is a connection between Instagram addiction and budget planning, a regression analysis is done.

Table 10. Results of the regression analysis of the effect of Instagram addiction on budget planning.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,113	,354		,320	,750
	Addicted	,726	,233	,221	3,121	,002***
	Female	,082	,147	,040	,562	,575
	Other_gender	,330	1,034	,023	,319	,750
	Age	-,109	,143	-,055	-,760	,448

Coefficients^a

a. Dependent Variable: Budget planning

Note: *p<0,1   **p<0,05   ***p<0,01

These results show that there is a statistically significant positive relation between Instagram addiction and budget planning (0,726, p<0,01). This means that respondents with self-reported Instagram addiction more often agreed with statements about spending more money relative to their monthly budget. For example, they save less money or have trouble makings ends meet at the of the month. Compared to students with low reported Instagram addiction, students with a high reported Instagram addiction do not have higher loan debts, but do have more problems with money. However, it is possible that students with Instagram addiction have more problems with their monthly budget planning, because of the lower loan debts. Another possible reason is, as showed before, that Instagram addicted students spend more money than they plan to. Therefore, they might overspend and have trouble making ends meet at the end of the month.

General discussion

Answering research questions

The goal of this research was to see if there is a connection between self-reported Instagram addiction among students in the Netherlands and a number of consumer behaviors. The consumer behaviors that were looked at are: Impulsive buying, product signaling and brand preference. In addition to that, difference in actual and planned behavior, student loan debts and monthly budget planning are looked over as well. A survey among students in the Netherlands was conducted to see if there is a relation between Instagram addiction and a number of consumer behaviors.

A factor analysis is used to create multiple regressions for each of the consumer behaviors. The first hypothesis that was tested was about impulsiveness. The relation between impulsiveness and some addiction already have been proved. However, there was no evidence for a relation between Instagram addiction and impulsiveness. The results of the regression analysis showed a positive relation between Instagram addiction and impulsiveness. Hypothesis 1 is accepted. Students with high reported Instagram addiction, compared to students with low reported Instagram addiction, are more impulsive.

Posting identity-relevant could cause a decreased interest in purchasing those items. Students with Instagram addiction might more often spend less money than planned because of this. A regression analysis is done to see if there is a difference between actual and planned behavior and to see if there is a difference between students with self-reported Instagram addiction and students without self-reported Instagram addiction. The results showed a statistically significant effect. Students with self-reported Instagram addiction seem to spend more money than planned more often than students without self-reported Instagram addiction. Therefore, the second hypothesis is rejected.

Instagram is about posting pictures and showing your life. A regression analysis is done, to see if Instagram addicted students spend more money to improve the picture they post. The results showed that Instagram addicted students attach more value to high signaling products. However, the results showed as well that Instagram addicted students, compared to non-addicted students, preferred to buy counterfeit products instead of the original ones more often. Therefore, hypothesis 3 cannot be accepted nor rejected, because buying counterfeit products is cheaper than buying original products. Instagram addicted students might spend less money.

Another consumer behavior that is tested shows if there is a relation between Instagram addiction and brand preference. Instagram addicted consumers spend more time on Instagram and might see more posts or advertisements about their favorite brands. However, the results showed no statistically significant relation between Instagram addiction and brand preference. Therefore, hypothesis 4, students with high reported Instagram addiction, compared to students with low reported Instagram addiction, have higher brand preference, cannot be accepted or rejected.

The last two regression that are done are about the spending behavior of the respondents. Since 2015, students are able to get a loan from the Dutch government to be able to pay for college. As showed before, there are some reasons why a student with Instagram addiction might spend more money than students without Instagram addiction. To test if this is true, two regressions are done. The first regression tested if there is a relation between Instagram addiction and student loan debt. However, these results showed no statistically significant relation. The second regression was to see the relation between Instagram addiction and budget planning. The results showed a statistically significant positive relation. This means that students with Instagram addiction, compared to students without Instagram addiction, have more problems with their monthly budget planning.

Academic implications

Previous research already showed the effect of different addictions on consumer behavior. However, the effect of Instagram addiction has not been investigated yet. Instagram addiction is a relative new addiction compared to for example alcoholism and drug addiction. Instagram is still growing and therefore Instagram addiction can become more of a problem as well. This research showed that Instagram addiction has a significant effect on some consumer behaviors. However, there are still a lot of other topics, that have a relation with Instagram addiction, that should be investigated.

Limitations and Further Research

In this research, only a few consumer behaviors have been tested to be effected by Instagram addiction. As mentioned before other topics can be investigated as well. There are more consumer behaviors that might be effected by Instagram addiction. Since Instagram addiction is a relative new addiction, a lot information is still unknown. Further research is needed to see more relations of Instagram Addiction, for example with other consumer behaviors.

A limitation in this research is the number of respondents with self-reported Instagram addiction. More respondents with self-reported Instagram addiction might provide more significant regression. As said before, Van den Eijnden et al. (2016) considered someone addicted to social media if they met 5 out of 9 questions. In this research a respondent is considered as Instagram addicted if they met 4 out of 9 question. If more respondents met 5 out of 9 questions, it might have been better to consider someone as addicted if he or she met at least 5 questions. The outcomes of the regression might then be a better reflection to reality.

As mentioned before in this research, two principal component analyses are done. When one principal component is done, the survey questions about impulsiveness and impulsive behavior last week are mixed into one factor. However, then it is not possible to test the effect of Instagram addiction on impulsiveness and impulsive behavior last week. In this research a separate factor is made for impulsiveness and another PCA is done for the remainder variables. When further research is done, it is best to have one Principal Component Analysis.

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Appendix

Appendix A

Component Matrix[a]	Component
	1
I often buy things without thinking.	,854
"Just do it" describes the way I buy things.	,844
I often buy things spontaneously.	,807
"Buy now, think about it later" describes me.	,797
"I see it, I buy it" describes me.	,782
Sometimes I am a bit reckless about what I buy.	,700
Sometimes I feel like buying things on the spur-of-the-moment.	,662
I buy things according to how I feel at the moment.	,638
I carefully plan most of my purchases.	,515

Extraction Method: Principal Component Analysis.
a. 1 components extracted.