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Social media and reference points: How people are affected by watching high economic status

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Abstract

This paper presents an experimental survey study investigating the potential effects of social media usage on economic perceptions and life satisfaction by influencing reference points. The prediction is that watching people with high economic status on social media raises reference points, resulting in increased preferences for consumption and salary. The theoretical prediction is that this would decrease the life satisfaction of social consumers. The study does not find significant results and cannot confirm the predicted effects of social media usage. The study contributes with a theoretical background and some empirical evidence supporting the application of reference-dependent utility models in studying the effects potential effects of social media. Considering the methodological limitations of the study, it is possible that the hypotheses in this paper can be confirmed by future research projects with greater scope and resources.

Keywords: Social media; Reference points; Desires consumption; Labor supply; Life satisfaction

Acknowledgement

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Chapter 1

Introduction

If a house of the average quality on earth were provided to a wealthy man raised in a rich environment, he would likely be disappointed and complain about the conditions. If an identical house was given to a much less wealthy man raised in a poor environment, he may appreciate it and enjoy the conditions. The difference is perhaps not that the two individuals have fundamentally different preferences for housing, but rather that they have different reference points, limiting the utility the wealthy man receives from the house. Reference points may be thought of as subjective benchmarks of comparison such as expectations and perceptions of other people, and may affect our behavior and well-being in virtually any scenario; reference points have been found to impact effort provision among marathon runners as they have revealed preferences for finishing better than rounded numbers (e.g. 3h59m instead of 4h) (Allen et al., 2017), loss aversion and status quo bias induce people to behave differently in the context of gaining and losing something (Tversky and Kahneman, 1991), and for the same reason of reference-dependency, the video game Pong would probably not be a hit had it been reintroduced today. The commonality is that people's preferences and decisions depend on measures relative to some reference.

Behavioral economics has already discovered that people value states not solely based on absolute values, but values relative to reference points, and that phe-

nomenon affects human utility and behavior in a variety of economic circumstances. For instance, Kahneman and Tversky (2013) paper on Prospect theory, an application of reference-dependency, has been cited over 75 thousand times on Google Scholar. How and where reference points are formed may be subtle and complex, but have been found to be influenced by the individual's environment such as family, neighbors, colleagues, or perceived societal averages (Kahneman, 1992). In other words, where people meet and interact with others.

The modern place where people meet and interact with others is social media. The effects social media consumption has on our well-being are particularly important since it affects a lot of people. Estimates show that over 4,5 billion people use social media globally and that number is projected to increase by another billion in three years (Statista, 2023a), and the average global amount of time spent on social media weekly is above 17 hours (Statista, 2023b). One difference between human interaction in person and online is that geographical conditions tend to homogenize people close to each other in terms of economic outcomes. Reference points formed by physical interaction should be relatively aligned with realistic expected values of economic prosperity. Wealthy people in Beverly Hills presumably mainly interact with other people from Beverly Hills and have decreasing interactions with people from other areas, states, countries, and continents with diverging economic conditions. However, these geographical constraints do not apply when reference points are formed on social media digitally, which may induce larger differences between the economic conditions and the corresponding reference points of social media consumers.

There could be a bias toward content portraying luxurious lifestyles on social media platforms, as many of the most popular accounts are celebrities with high incomes. For instance, the ten most followed personal profiles on Instagram are all public figures with annual incomes well into the millions of dollars (See Appendix B). If social media consumption raises reference points generally, the perceptions, behavior, and well-being of half of the people on Earth may be affected by the phenomenon. Apart from understanding how usage affects societies today, knowledge about social media

and reference points may help predict some behavior among people in societies that have yet to transition to broad social media usage. The impact of social media is not only an issue for today, as the younger generations are the largest group of social media consumers. OECD (2019) reports that 89% of people in their nations aged 16-24 use social media regularly.

Many previous studies have applied the concept of reference-dependent utility functions, for instance (Kahneman and Tversky, 2013) (Clark et al., 2008)(Neumann-Böhme et al., 2021), and social media usage have been found to affect economic decision-making under a variety of circumstances (Mosquera et al., 2020) (Chou and Edge, 2012) Allcott et al. (2020). Given these previous findings, one hypothesis is that social media consumption has economic implications by influencing people's reference points. By influencing reference points, social media consumption may cause people to take greater risks(Tversky and Kahneman, 1991), increase their willingness to work and consume(Kimball and Shapiro, 2008), or be less satisfied with their life in general (Verduyn et al., 2017).

This study is an investigation of such hypotheses. By surveying economic desires and perceptions and observing differences when participants are treated with social media content, conclusions can be drawn about how people in general could be affected by current and future social media usage. In particular, this paper asks the following research question:

Does popular social media content affect consumers' economic desires for consumption and salary by raising reference points?

The study investigates the research question by collecting data from a survey experiment after randomly assigning half of the participants into a treatment group presented with social media content. Social media content in this study is limited to the consumption of online content portraying the life of other people. Other forms of social media usage are disregarded since people's reference points should primarily depend on perceptions about the lives of other people. Specifically, the type of social media content used in this study is pictures and videos of currently

popular social media creators from social media platforms Instagram, Youtube, and TikTok. The content selection is based upon the narrow definition of social media consumption above, and includes videos from the most followed personal accounts. A pre-study validated the interpretations that the social media treatment is representative of social media usage and portrays human lives with high standards in terms of economic status and life satisfaction (For more details, see Appendix A & Appendix B).

The main variables of interest are consumption and salary desires, the perceived consumption of others, and the treatment effects. The study does not find significant results for any of the four hypotheses. Reference-dependent utility theory has not been applied to social media consumption in an experimental study like this before, and the economic literature may be at an early stage in the understanding of social media's effects on people since it is a quite recent phenomenon. This study contributes with a theoretical background, some empirical evidence, and a discussion about how social media might affect the economic decision-making and well-being of people.

Chapter 2

Literature review

The hypothesized effect investigated by this study is a mix of two topics: Economic reference-dependency and social media consumption. The economic literature may be at an early stage in understanding the effects social media might have on its consumers since it is a quite new phenomenon. This chapter provides a theoretical and empirical background from relevant previous research on how the theories of reference points may be applicable to social media consumption.

2.1 Reference points

It is an established view in modern economics that people's preferences are not solely explained by absolute economic conditions, but in many cases critically depend on reference points. In particular, behavioral economists Kahneman and Tversky (2013) have concluded that reference points are significant parts of people's utility functions, and their presence affects behavior because people value economic states based on relative measures compared to reference points. Reference points are perhaps subtle and complex in reality, but has found to be formed based on prior, current, or expected states, or perceptions of other people's values the individual relates to such as family members, neighbors, or national statistics (Clark et al., 2008). Reference points may be viewed as subjective perceived benchmarks people relate to when assessing economic states, with anchoring effects on utility (Kahneman, 1992).

Tversky and Kahneman (1992) developed prospect theory, implying that people behave differently when they possess lower values of a certain source than their reference point. In particular, people have been found to take greater financial risks when they unexpectedly lose money because of reference points. For instance, Engström et al. (2015) finds that more people take the risk of not complying with tax legislation when being confronted with unexpected payments. The point is that people generally are 'loss-averse', and tend to take greater risks in order to avoid being below reference points. Similar loss aversion behavior could be induced by social media consumption if it raises people's reference points.

Preferences for consuming certain products have been found to be influenced by reference groups' income and consumption levels. Using the 2005 Consumer Expenditure Survey, one study finds that expenditure ranking is the strongest substantive factor in determining clothing consumption and the number of automobiles owned. People spend money on clothing and automobiles not based on absolute spending, but on the consumer's spending relative to others (Gasana, 2009).

A literature review study on social status concluded that the utility gained from social status depends on reference points, and relative social status is more relevant than absolute values. The study refers to two different types of reference points, internal reference points as comparisons over time (e.g. getting used to something) and external reference points as comparisons with other people. The study even suggests that people in some economic conditions may depend on reference points to the degree that absolute income increases no longer increase happiness (Clark et al., 2008). Hence, if reference levels of social status are raised by consuming social media, it could increase the preferences for status, and perhaps decrease life satisfaction.

In a study from the Netherlands, participants assessed their income and health after being exposed to reference points. The study finds that income is important for subjective well-being both in absolute and relative terms (Neumann-Böhme et al., 2021). Studying panel data from survey observations on happiness and income during five years in Australia, Paul and Guilbert (2013) find that increases in reference

groups' income decrease the happiness of people. The effect is general, but strongest for those with the lowest income.

2.2 Social media

Economic applications of social media, or social networking, have been outlined in a chapter of the Handbook of Social Economics by (Jackson, 2011a). Social media may influence economic behavior due to 'peer interactions'. As described in the Handbook, people's decisions often depend on one another, and increased communication and interactions may influence game-theoretic equilibria in a variety of economic circumstances such as labor market participation (Jackson, 2011a). One example where one person's labor decisions depend on another is if desired income depends on reference levels of other people's income. If social media usage would increase human interactions generally, perhaps it also increases social comparisons and the influence of reference points.

The Handbook concludes that social networking online has economic 'tremendous potential for future application' in economics because of the fundamental role it plays in shaping human activity, and embraces future studies to utilize variation in social networking to improve the understanding of the patterns of human interaction and economic behavior(Jackson, 2011b). Although it does not mention the application of reference points explicitly, the potential connection between increased interaction with other people and social comparisons forming references makes theoretical sense.

Several studies find negative relationships between happiness or life satisfaction and social media usage. Hawi and Samaha (2017) performed an online survey with a social media usage questionnaire, and their results showed that consuming social media decreases self-esteem, which in turn decreases life satisfaction. Another study finds a positive relationship between actively using social media and subjective well-being, but a negative relationship between passive usage and subjective well-being. The reason passive usage decreases well-being is that it provokes 'social comparisons and envy' (Verduyn et al., 2017). The social media usage in this study corresponds to passive usage, since participants merely monitor the lives of others without two-

sided interaction.

Several papers have studied the effects of Facebook usage on well-being. Facebook usage may have similar effects to the social media content incorporated in this study, and provide grounds for the hypothesized effects. One study finds that Facebook usage increases feelings of depression. The authors suggest that social media usage may decrease well-being by the opportunity cost of spending time on healthy activities, or because of intrinsic features of the social media consumption itself (Mosquera et al., 2020). Another study finds that being off Facebook for four weeks increases subjective well-being and decreases future Facebook usage persistently. The interpretations are somewhat paradoxical; although people have obvious preferences for Facebook usage and had to be paid to avoid it, it reduces the well-being of the consumer (Allcott et al., 2020).

A review of studies on Facebook usage suggests that it causes feelings of envy and depression, and may decrease well-being. The paper mentions several studies connecting social comparisons to the envy brought about by social media consumption, and suggests that the way in which achievements are portrayed may on social media may explain the effects (Appel et al., 2016). In a survey study asking a state university in the United States, Facebook usage was found to impact how people assess their life relative to others. Those spending more time on Facebook said that others are happier and have better lives than themselves (Chou and Edge, 2012). This suggests the impact of reference points, and that the perceptions of others influence well-being, and perhaps also economic decision-making.

Decreased well-being caused by social comparisons on social media is an example of how individuals may be affected by reference points. The psychological state of envy may be translated into economic terms as a state in which individuals perceive themselves below their respective reference points. Hence, if there is a positive bias in the standard of living portrayed on social media, the net effect should be decreased utility and well-being, as suggested by the studies mentioned above.

There have been many papers studying certain behavioral effects of social media

consumption, such as its effects on psychological states, social comparisons, and well-being, as outlined above. However, none of the studies found integrate it directly with the economic utility theory of reference-dependency. The effects found in previous studies together with the reference-dependent literature give grounds for the hypothesis that social media consumption affects the decisions of utility-maximizing individuals through reference points, which is the purpose of this study.

Chapter 3

Theoretical Background

The core premise of the idea behind the study is that the utility functions of individuals depend on reference points. Utility-maximizing individuals value different states based on the total utility provided by a set of sources (such as consumption, income, social status, etc.), and the idea is that those partly depend on values of references, such as internal comparisons over time and external comparisons to other people. This is already established in the economics literature (for instance, see (Kahneman and Tversky, 2013).

There are two different ways to interpret the effect of reference points in the utility function. In (Tversky and Kahneman, 1991), the reference-dependent utility function is explained similarly to the following equations:

$$U = U(X_1, X_2, ..., X_n) \ (1)$$
$$\text{where } U(X_i) = u(x_i) - u(x_i^*) \ (2)$$

The general concept of reference points is described by equations (1) & (2) above. The utility of a person depends on a number of sources X_n, and the utility drawn from those sources depends on the utility of the possession of the source x_i and the negative utility from the reference point x_i^* associated with it.

A slightly different way to view the impact of reference points is that the fundamental utility an individual draws from anything reference-dependent is the difference

between their own possession and the reference point, as equation (3) below shows:

$$U(X_i) = u(x_i - x_i^*) \ (3)$$

In either case, if the utility function depends negatively on reference points, the decisions and priorities of utility-maximizing individuals will be affected if the references change. For instance, if people's preferences for consumption increase with their perceptions of others' consumption, one may expect people to sacrifice leisure in order to work more if they live in a wealthy environment, ceteris paribus. In this example, reference-dependent utility could be an explanation for why the labor supply tends to be insensitive to income increases, despite decreasing marginal utility from consumption, as discussed in (Kimball and Shapiro, 2008).

The sources of utility observed in this study are Consumption, Salary, and Social Status. Hence, in equation (2), x_i is the utility drawn from those sources. x_i^* is the reference point hypothesized to be influenced by social media usage. The effect of reference points is measured indirectly through the desires for consumption, income, self-reported social status, and total life satisfaction, but also directly through asking about the perceived level of consumption of other people. The perception of other people's consumption may only partly capture the full impact of reference points. The complexity and difficulties in observing true reference points is one of the main limitations of the study.

The concept of reference-dependent utility leads to the premise that reference points determine preferences. Due to the limitations of this experimental survey study, only desires and perceptions are observed. However, those may be assumed to correspond somewhat to the actual preferences of people under real-world circumstances. Formal hypotheses given these premises are outlined below.

3.1 Hypotheses

Four main hypotheses are derived from the theory of reference-dependency and applied to social media usage. The null hypothesis is that the distributions of the different outcome variables observed in the study are equal for the control and

treatment groups of participants. The alternative hypotheses claim that differences exist due to the randomized exogenous treatment status.

Null hypothesis: $\mu_{control} = \mu_{treatment}$

Alternative hypotheses: $\mu_{control} \neq \mu_{treatment}$

There are four outcome variables hypothesized to be affected by social media usage indirectly through unobserved reference points; desired consumption, salary priorities, relative social status, and self-reported life satisfaction. The perceived consumption level of other people observes the impact of reference points directly. The motivations behind these variables are outlined below.

Results from a lab experiment on reference points and effort provision show that people choose to work more to earn higher income when reference points are manipulated higher. Their results are interpreted in the context of labor supply, and evidence that the labor and leisure trade-off depends on expectations as reference points (Abeler et al., 2011). One example is a study on taxi drivers in New York City, whose daily labor supply corresponds to reference-dependent loss aversion utility function (Camerer et al., 1997). If the labor supply depends on reference points, social media usage may affect the priorities for future job selections and current career decisions.

Hypothesis 1: The social media treatment has a positive effect on the importance of salary when assigning probabilities to hypothetically choosing different jobs. This is tested when observing job preferences in Model 1 and Model 2 under 'Model Estimations'.

The reason increased reference points would induce people to sacrifice leisure for income to a greater extent is presumably mainly in order to consume more. Hence, observing future consumption desires is another way to understand the effects of social media usage and reference points.

Hypothesis 2: The social media treatment has a positive effect on the desired level of consumption. This is tested when estimating the treatment effects in

Model 3.

A literature review on social status concludes that people generally have preferences for relative social status, and that the utility received fundamentally depends on the social status of others (Clark et al., 2008). If the utility drawn from social status depends on the characteristics of others, it must also depend on the information about other people. Hence, studying self-reported relative social status among the treatment and control groups may be one way social media affects people through reference points.

Hypothesis 3: The social media treatment has a negative effect on self-reported relative social status. This is tested in the estimated effect of treatment in Model 5.

A literature review by Appel et al. (2016) shows a number of studies finding negative relationships between social media usage and well-being, although utility-maximizing individuals seem to continuously choose it. One reason social media usage decreases the well-being of its users is that social comparisons online increase reference levels of properties such as income, consumption, and social status.

Hypothesis 4: The social media treatment has a negative effect on life satisfaction. The estimated treatment effect in Model 6 tests this hypothesis.

These hypotheses are tested by collecting data through conducting a survey experiment. The data is estimated using regression estimates outlined under 'Results'. The data collection and methodology of the study are described in more detail in the following 'Method'.

Chapter 4

Method

To investigate the effects of social media on economic perceptions and desires, the core of the methodology is as follows. The data collection in the study was from an online survey asking a subject pool of students questions regarding their economic desires and perceptions, while treating half of the participants with social media content portraying the lives of people with high economic status. The random allocation in the treatment pooling means that the participants can be assumed to be identical in all aspects not affected by the treatment status. If the observed desires and perceptions are different for the treatment group, the effects are interpreted as evidence of the social media content's influences on consumers.

The subject pool of the study was a list of current economics students from universities in Sweden. 9586 emails were sent, out of which 327 voluntarily choose to participate. Participation was incentivized through monetary rewards based on the number of correct answers to the objective questions in the survey. These objective questions were connected to each video to incentivize participants to pay attention to the video they are watching. Incomplete survey responses were discarded, and a total of 201 observations are included in the data analysis.

The main outcome variables collected were desired future consumption and the importance of salary in the revealed preference for different hypothetical job options. The trade-off in the job selection was between monthly salary, hours per week, and

risk of getting fired, where participants assigned probabilities of choosing nine three different jobs over three scenarios.

4.1 Experimental design

The creation of the experiment may be decomposed into several successive elements. Firstly, the subject pool was based on a contact list of economics students collected from most universities in Sweden. People were notified of the survey by email. An initial email was sent, briefly describing the survey and encouraging participation while emphasizing the monetary incentives, as well as a reminder that was sent out a few days later. Secondly, half of the participants were randomly pooled into a treatment or control group with a probability of 0.5. The creation, distribution, and randomization of the survey were all made with the software Qualtrics. After two weeks of having the survey active, the data were downloaded for analysis. Finally, the monetary prize of 1 000 SEK was distributed to the winner of the participation-incentivizing lottery. The process of finding a winner was simple; each correct answer in the objective questions awarded one ticket, and one lottery ticket was randomly selected as the winner. The ticket belonged to identity #52 in the experiment, and the money was distributed through the financial service Swish.

4.1.1 Main survey

Videos including recent clips from the most followed social media accounts on the most popular social media platforms, in Sweden and globally, were selected as the content for a treatment group. To account for potential influences from watching a video in itself, other clips, not portraying the life of any person, were selected as content for a control group. After having watched their respective video content, both groups of participants were asked identical questions related to their economic desires for different sources of utility such as consumption, salary, social status, as well as life satisfaction in general. For more details on the video content for the control and treatment groups, see Appendix B.

After receiving instructions, participants started the first segment of the study consisting of a sequence of videos with a question attributed to each. Each participant

was presented with four videos and four questions. Each video is about 1 minute long. The four questions were the only objective questions contributing to the participation-incentivizing lottery, where each correct answer awarded one ticket. The content in the videos was controlled and varied between a treatment and a control group.

The treatment group was presented with videos showing a number of social media posts portraying lives with high-end economic status and life satisfaction. All content displayed was from the ten most popular accounts on social media platforms Instagram, Youtube, and TikTok either in Sweden or globally. The videos showed a series of short clips from the content of the social media profiles included. There was a mix of videos and pictures portraying the creator and his or her experiences. Oftentimes, luxury consumption was showcased through expensive cars, clothing, or vacations. The full list of social media profiles included is found in Appendix B, and the content presented in the video was intended to be representative of the content posted by the selected account at the time of the experiment.

The control group was presented with videos showing non-social media content, i.e. videos that do not portray the lives of people and are not representative of social media consumption. The videos included graphics from an animated children's movie, artistic drawings, a nature documentary, and a video describing quantum mechanics. The point was to isolate the effect of social media consumption by varying the content shown in the videos while holding all else constant. Hence, the remaining parts of the survey were identical for all participants.

The second segment elicits the main outcome variables. Participants were asked questions related to their economic desires and satisfaction in different aspects. The first questions were regarding desired consumption and the perceived level of consumption of other people. Participants also revealed job preferences in a hypothetical selection problem. The job selection problem consisted of three scenarios with three alternatives each, varying with respect to monthly salary, workload, and risk of being fired (and remaining unemployed for a year). The survey questions and data analysis of the job selection was based on the research of (Wiswall and Zafar, 2018),

with some simplifications. The survey also included questions on self-reported social status and life satisfaction.

The final segment consisted of questions for obtaining data for control variables. Participants were asked about their social media usage the week prior to the experiment, the degree of urbanization during their upbringing, as well as demographic questions about age and gender. The full questionnaire can be seen in Appendix B.

4.1.2 Pre-study

A pre-study was conducted to validate that the content used in the different experimental conditions was perceived in the intended way. Sixteen participants were asked to rate how they perceive the degree of economic standard of living and life satisfaction portrayed in all videos shown to the participants of the main study. In addition, pre-study participants answered how representative each video is of social media consumption.

The pre-study validated the interpretation of the video content presented to the two randomly selected groups of participants. Pre-study participants were asked to rate eight videos on a scale from 0-10 in terms of the degree of economic standard portrayed and how representative of social media consumption they were. Each of the treatment videos got an average of more than 7,5 in both parameters, and over 90% of the participants said that the four control videos do not portray the life of a person and that the other questions are not applicable to the video. For more details, see Appendix A.

Hence, treatment status is interpreted as being presented with four videos portraying people with a high economic standard of living from representative popular social media creators. The control status is interpreted as being presented with four videos that do not portray people, are not representative of social media consumption, and do not showcase any economic standard of living.

4.2 Econometric models

The following section variables observed in the experiment, the stated hypotheses of the study, and the main regression models estimated.

4.2.1 List of Variables

The List of Variables below summarizes the variables included in the data collection corresponding to the answers to the survey. The columns show the label, unit, and description of each variable.

Table 1: List of Variables

Variable	Unit	Description
C	SEK	Desired level of future monthly consumption
C_{ref}	SEK	Perceived average monthly consumption of other people
$Pr(Job_k)$	Prob	The probability assigned to each job
$Salary_k$	SEK	Salary for job option k
Exp.Salary	SEK	Expected level of monthly salary given job selection
SS	1 - 10	Self-reported relative social status
LS	1 - 10	Self-reported life satisfaction
Treatment	0 , 1	Treatment status. T=1 for the treatment, T=0 for the control
C_{ref}_T	Interaction	$C_{ref} \times Treatment$. Interpreted as the increased effect of reference level if treated
Salary_T	Interaction	$Salary \times Treatment$. Interpreted as the increased effect of salary if treated
SM	Hours	Hour spent on social media the week prior to the experiment
Age	Years	Self-reported age of the participant
Female	0 , 1	Gender dummy. It takes the value 1 for women and 0 for men
Urban	0 - 100	Degree of urbanization while being raised on a scale from 0 to 100
Sc.1	Dummy	Dummy variable for scenario 1 in job selection
Sc.2	Dummy	Dummy variable for scenario 2 in job selection

4.2.2   Regression models

The main models estimated in the study are found below. The study is primarily concerned with the estimated treatment effects of Model 1 on hypothetical job preferences and Model 3 on consumption desires. The models also test the impact of control variables Age, Female, and Urban. All estimations can be found in Appendix

X.

The hypotheses outlined in 'Theoretical Background' are estimated in the following models. Hypoethesis 1 says that there is a positive treatment effect in the preferences for salary when choosing a job. Model 1 below estimates this through the variable SalaryT, which is an interactive variable of Salary multiplied by the treatment status (0, 1). Its coefficient β_1 is interpreted as the increased desire for salary in choosing jobs when being treated in the experiment with social media.

Model 1: Salary in job selection

$$Probab_{ki} = \beta_0 + \beta_1 \times Salary_k + \beta_2 \times Scenario_1 + \beta_3 \times Scenario_2 + \beta_4 \times SalaryT_i + \beta_5 \times Treatment_i + \epsilon_i$$

Model 2 below is an alternative way of observing differences in preferences for jobs between the treatment and control group. In this model, the main variables of interest are RiskS and WorkS, and their coefficients are interpreted as the different effects Risk and Workload have on the desire for Salary.

Model 2: Job priorities, treatment vs control

$$Probab_{ki} = \beta_0 + \beta_1 \times Salary_k + \beta_2 \times Sc.1 + \beta_3 \times Sc.2 + \epsilon_i$$

Hypothesis 2 says that the social media treatment has a positive effect on the desired level of consumption. The determinants of consumption desires are observed in Model 3. The variable of interest is C^*T, and its coefficient is interpreted as the effect the social media treatment has on the reference variable C^* in explaining the desired level of consumption.

Model 3: Consumption

$$C_i = \beta_0 + \beta_1 \times C_{ref\_}T_i + \beta_2 \times C_{refi} + \beta_3 \times Treatment_i + \epsilon_i$$

The predictions of the effect of previous social media usage are less clear, since the content of such usage is not controlled. However, some general conclusions may be drawn by studying the effects of participants' regular social media usage.

Model 4: Previous Social Media

$$Y_i = \beta_0 + \beta_1 \times SM_i + \beta_2 \times Treatment_i + \epsilon_i$$

$$\text{where } Y_i : (C, C_{ref}, Exp.Salary, SS, LS)$$

Hypothesis 3 says that the social media treatment has a negative effect on relative social status. This is tested in Model 5.

Model 5: Social Status

$$SS = \beta_0 + \beta_1 \times C_i + \beta_{2i}^* + \beta_3 \times C^*T_i + \beta_4 \times T1_i + \beta_5 \times T_i + \beta_6 \times SM_i + \epsilon_i$$

Hypothesis 4 says that the social media treatment has a negative effect on life satisfaction. Model 6 tests this by observing the determinants of life satisfaction outlined below.

Model 6: Life satisfaction

$$LS_i =$$

$$\beta_0 + \beta_1 \times C_i + \beta_2 \times C_i^* + \beta_3 \times C^*T_i + \beta_4 \times T1_i + \beta_5 \times T_i + \beta_6 \times SM_i + \beta_7 \times SS_i + \beta_8 \times SST_i + \epsilon_i$$

The research question is whether the consumption of social media affects people's reference points. The outcome variables presented above are different methods of observing the existence of reference points indirectly through their effects. Reference points have been suggested to be important in explaining how people perceive their economic and social status, as well as self-reported life satisfaction (Clark et al., 2008). What is perceived as normal may also be manipulated by influencing reference points, such as the average salary among different groups of people. Furthermore, one implication of Prospect Theory is that people are predicted to take greater risks to achieve larger gains, particularly when below the reference level (Tversky and Kahneman, 1992). People's preexisting reference points may also depend on conventional demographic variables age and gender, as well as previous social media usage and the degree of urbanization they were brought up under.

The three platforms used for social media treatments Instagram, Youtube, and TikTok were selected because they are the three largest in terms of global users (excluding WeChat since it is only available in China, Whatsapp since it offers a different type of service, and Facebook because its content is largely informative

text content not portraying the life of a person) (Statista, 2023b). The treatment effect of interest is between no social media consumption and consuming the selected social media content. Although the treatment videos are selected and confirmed to show the participants high economic standards of living, all content is from the most popular accounts from some of the most popular social media platforms, meaning that the results are relevant in a discussion about social media consumption in general.

4.3   Ethical considerations

All participants knew that they were part of a research experiment taking about six minutes to complete, and all participation was voluntary. The processes for finding the winners of the participation lottery were transparent and accurately reflect the performance in answering the objective questions in the experiment. The purpose of the experiment was not clear to the participants, but this should not have affected the incentives or probability of winning the monetary prize. The purpose was to ensure that participants were unable to see through the questionnaire, which could affect their answers. The winner of the lottery received 1 000 SEK through the financial service Swish, according to the instructions ahead of the survey experiment.

All answers were completely anonymous, with the exception of an optional text field at the end where participants may submit a number connected to payment service Swish, with the sole purpose of distributing the monetary prizes to winners, and all email addresses were deleted two weeks after the completion of the survey. All material used in the experiment is public information and anyone could in principle treat another sample of individuals identically as this study to validate the results.

4.4   Limitations

There are a few notable limitations in the methodology of the study. Firstly, the treatment effect is short and reference points are likely to be affected by social media usage prior to the experiment if the hypotheses are true. The social media treatment is only about four minutes, and may only capture small effects of social media usage. However, Baucells et al. (2011) finds that reference points are not recursive, but

critically depend on the most recent information. This means that even a small treatment impact may have significant effects on reference points affected by social media.

As discussed in (Abeler et al., 2011), there are inherent problems in studying reference points since perceptions are difficult to observe directly. The video content shown to the treatment group, and the questions asked in the survey, probably only cover a limited part of the determinants of reference points corresponding to the complete economic perceptions of the participants. Furthermore, the subject pool of students is a limitation since the group likely has low variation in income, a variable that could be relevant to the problem. There are also core limitations to an experimental survey study. While it enables a controlled treatment effect in a lab setting, resource limitations in the data collection mean that the number of observations and variables included are limited, reducing the amount of detail the data analysis may bring. Furthermore, the study is limited to observing social media's effects on economic desires and preferences in hypothetical scenarios. Hence, there may be a gap between the findings of this study and the actual decisions of people in a real-world setting. However, there are no reasons to expect there to be fundamental diverging differences between the two.

Chapter 5

Results

This chapter presents descriptive analyses of the data collected through the conducted survey experiment and the results from the model estimates. The main interpretations of the results are whether and how the treatment status, i.e. having been exposed to social media content, affects outcome variables regarding desires and perceptions about consumption, salary, risk, social status, and life satisfaction.

5.1 Data analysis

Table 2 below shows basic general descriptive statistics of the collected data. There were a total of 201 responses included in the data, with few missing observations. Notable is that the range in age is narrow, and because the subject pool is students, most participants are concentrated around the mean of 23 years old. However, there is higher variation in many of the variables, such as the revealed consumption and salary preferences.

Table 2: Descriptive statistics

Variable	Obs.	Descriptive statiscic			
		Mean	Std.dev.	Min	Max
C	198	25 547	21 674	15	125 000
C_{ref}	196	12 236	5415	500	35 000
Treatment	201	0.527	0.500	0	1
SS	201	5.577	1.595	1	10
LS	201	6.458	1.916	1	10
Age	201	22.597	3.493	10	42
Female	198	0.449	0.499	0	1
Urban	201	56.139	28.602	0	100
SM	201	16.203	11.645	0	60

The following Figures 1, 2, & 3 show the distribution in social media usage the week prior to the experiment, age, and degree of urbanization. There is relatively low variation in the social media usage and age variables, while data for the urbanization variable is almost evenly spread out.
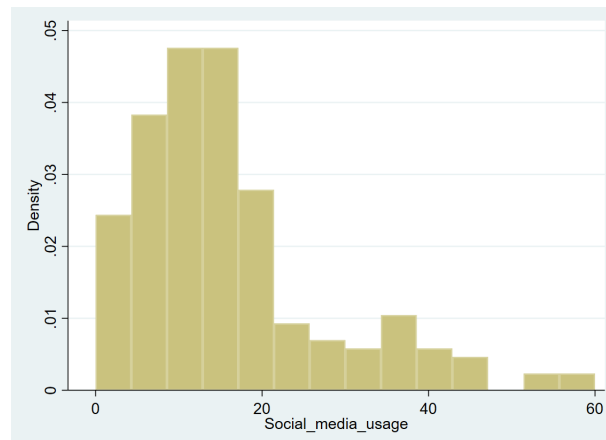

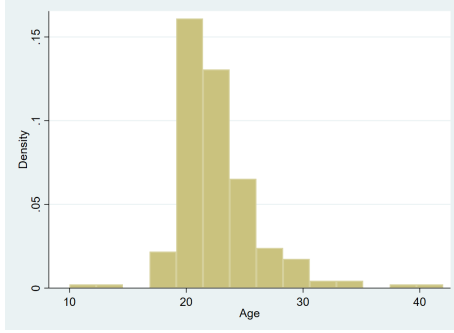Figure 1: Hours of social media usage the week before the experiment
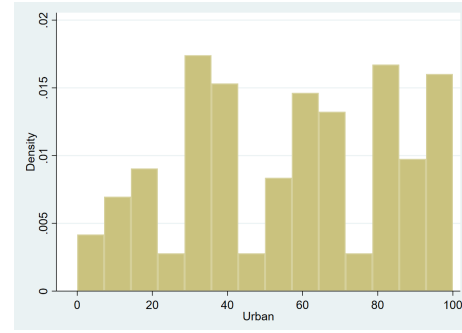
Figure 2: Distribution of Age

Figure 3: Distribution of Urban

5.2   Model estimations

The following section presents regression tables analyzing the estimated effects of Models 1-6 sequentially. In addition to the main models related to the stated hypotheses, a few supporting models and graphs are included to provide additional information to the research question of social media usage and reference points.

Job selection

One of the main effects studied is how social media usage might affect people's preferences for jobs. The prediction is that the treatment increases the importance of salary when choosing a job by raising reference points for income and consumption. Data was collected by letting participants assign probabilities of accepting three different jobs over three scenarios, varying with respect to Salary, Risk (of being fired), and Workload. More details of the observed in the experiment are found in Appendix B.

Table 3 below presents the estimations of Model 1 and Model 2 with the probability assigned to job k as the outcome variable, investigating hypothesis 1 stating that the treatment increases the positive effect of salary in the hypothetical job selection. The primary estimation is presented in Model 1 to the left. The effect of interest from the interactive variable Salary_T. Model 2 to the right estimates the effect of salary on the probability assigned to job k for the treatment and control groups

separately.

Table 3: Preferences for jobs

$Pr(Job_k)$	Model 1	Model 2	
	All	Treatment	Control
Salary	5.4e-4***	6.4e-4***	4.8e-4***
	(0.7e.4)	(0.8e-4)	(0.9e-4)
*Sc.*1	20.592***	23.370***	17.488***
	(2.726)	(3.373)	(3.990)
*Sc.*2	18.192***	20.651***	15.444***
	(2.519)	(3.450)	(3.687)
Salary_T	4.51e-5		
	(6.62e-5)		
Treatment	−1.978		
	(3.140)		
Constant	−2.866	−8.899	1.668
	(4.492)	(5.711)	(6.110)
Observations	1809	955	854

t statistics in parentheses

$^{*}\,p < 0.10$, $^{**}\,p < 0.05$, $^{***}\,p < 0.01$

Note: Robust standard errors in parentheses

Model 1 estimates Salary_T to be a positive but insignificant determinant of the probability assigned to a certain job option in the three different scenarios. The other variables do not have meaningful interpretations, as Sc.1 & Sc.2 merely account for the different job scenarios, and Salary & Treatment are effects of those variables outside of the predicted effect of Salary_T.

Model 2 to the right shows that both groups' job selection positively depends on the Salary in the job, which is achieved through sacrificing leisure and the risk of

being fired in the hypothetical job selection problem. The effect of higher salaries is slightly stronger for the treatment group, but with insignificant differences as shown in Model 2 above and Figure 4 below.

Figure 4 below shows the effect salary has on the probability of choosing a certain job. The blue line represents the estimated relationship for the treatment group, the green line is the same for the control group, and the grey area is the estimated 95% confidence interval. While the graph suggests that salary is slightly more important after being treated with social media, the differences are way smaller than required for significant results.
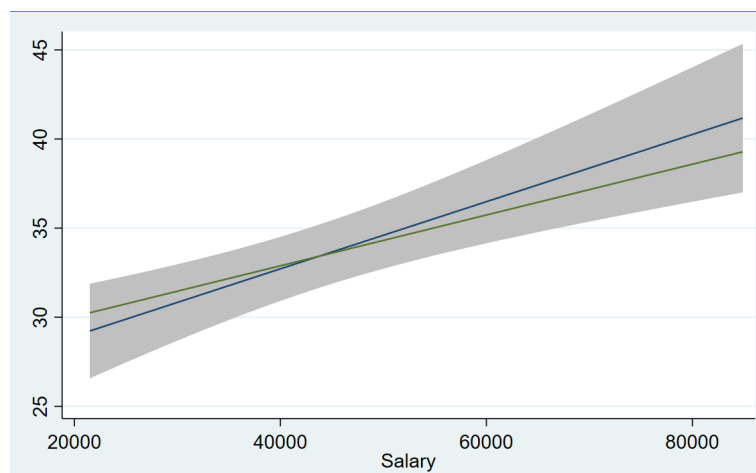

Figure 4: Probability assigned and the Salary of job options

Figure 5 below shows the differences in the average probability assigned to each job for the treatment and control group. The differences are relatively small, but the participants in the treatment group generally had slightly greater preferences for jobs with greater risk and higher salaries compared to the control group.

Job selection: Treatment vs Control

Figure 5: Job selection: Treatment vs Control

Figure 6 below shows a graph of a fitted line on the relationship between deciles of the expected salary chosen in the job selection (x-axis) and the portion of people receiving social media treatment (y-axis). The relationship seems weak for low levels of expected salary, but as the salary levels increase, the ratio of people in the treatment group increases. In particular, about 2/3 of the people with the 20% greatest hypothetical revealed preferences for salary in the hypothetical job selection were in the treatment group.
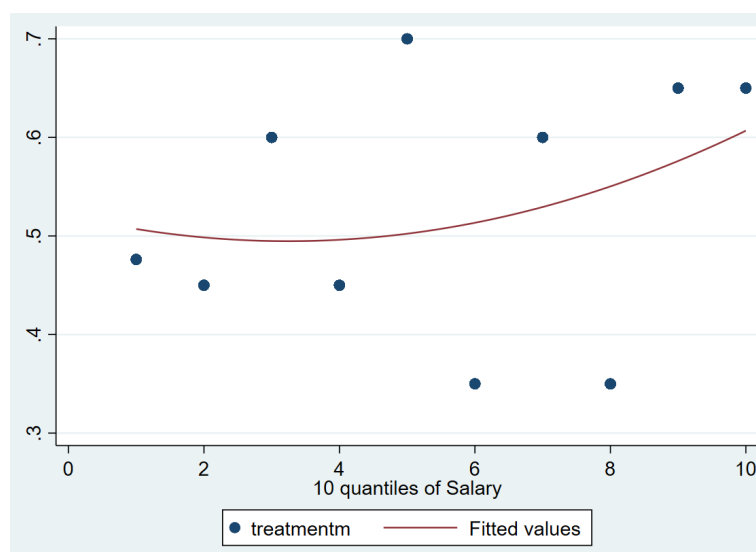

Figure 6: Treatment and consumption

Consumption and references

The second way this study observes the effects of social media usage on reference points is by surveying the desired level of future consumption and the perceived consumption levels of other people. The prediction is that desired consumption depends on the perceived consumption level of others, and that the treatment has a positive effect on both variables.

Table 4 below shows estimations of Model 3 with desired consumption as the outcome variable, with and without control variables. The variable of interest is C_{ref}_T, an interactive variable capturing the increased effect of C_{ref} on desired consumption when being treated with social media.

Both models in Table 4 estimate the effect of C_{ref}_T on desired consumption to be negative but insignificant. None of the control variables were found significant either. Desired consumption is highly correlated with reference consumption (C_{ref}) independently of the effects of the treatment, as shown in the coefficient to the C_{ref} variable and Figure 7 below.

Table 4: Consumption and Reference

Consumption	Model 3	
	Simple	With Controls
C_{ref_T}	−0.598	−0.428
	(0.541)	(0.561)
C_{ref}	1.747***	1.732***
	(0.401)	(0.416)
Treatment	8181.153	6134.156*
	(7250.441)	(7494.991)
Age		−711.223
		(432.830)
Female		−2272.247
		(2973.0)
Urban		64.983
		(52.593)
Constant	3874.69	17 630.61
	(5409.664)	(11 234.5)
Observations	196	193
Adjusted R-squared	0.118	0.121

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Robust standard errors in parentheses

Figure 7 below shows the estimated non-linear relationship between perceptions about others' consumption (x-axis) and own consumption desires (y-axis). The fitted line shows that the relationship is estimated to be nonlinear and positive with decreasing marginal effects. Removing outliers in the data does not affect the estimated fitted line to any meaningful extent.
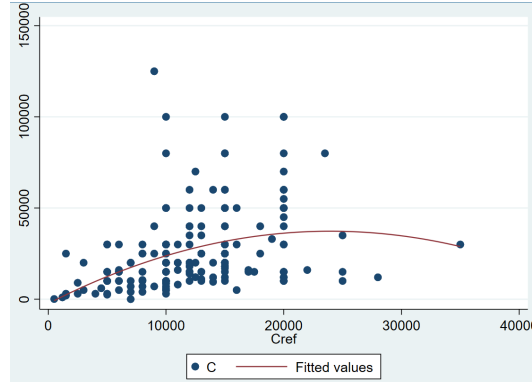
Figure 7: Nonlinear reference-dependence

5.3   Secondary findings

The following results are found and analyzed inductively and were not hypothesized in advance. Additionally, the interpretations of variables other than the treatment effect may be disturbed by sample biases. However, they may still provide some information on human behavior in the context of social media and reference points.

Previous social media usage

One of the main limitations of the study is that the treatment effect of social media consumption is small in comparison to the amount of time participants have spent on social media before taking the survey. To provide grounds for a discussion about this, data on social media using the week prior to the experiment was collected and analyzed. Since the content of this social media usage is not controlled, it is less clear what the predictions would be. The type of social media consumed by the subject pool of Swedish students may be unrepresentative of social media consumption generally.

Table 5 below shows presents estimations results of models observing the treatment effects on all relevant outcome variables collected through the experiment. The effect of the treatment status can be interpreted as causal due to the randomized pooling, while previous social media usage (SM) is not exogenously varied, but may provide some indications of the effects of social media usage in general.

Table 5: Previous Social Media Consumption

	Model 4				
	C	C_{ref}	Exp.Salary	SS	Asat
Treatment	585.937	−147.563	13 366.94	0.152	0.205
	(3144.967)	(762.027)	(17 904.45)	(0.227)	(0.263)
SM	−234.740*	−32.492	−1763.904**	−0.009	−0.028**
	(135.248)	(34.332)	(774.183)	(0.010)	(0.011)
Age	−185.622	389.220***	−4610.216**	−0.083**	−0.155***
	(446.375)	(107.882)	(2551.34)	(0.032)	(0.038)
Female	−2598.383	490.782	−61 415.06***	−0.248	0.087
	(3151.359)	(770.039)	(17 950.39)	(0.228)	(0.264)
Urban	89.308	13.814	345.459	0.006	0.007
	(54.722)	(13.232)	(311.605)	(0.004)	(0.005)
Constant	29 617.03**	3120.914	1 637 539***	7.268***	9.858***
	(11 957.15)	(2894.179)	(68 426.16)	(0.869)	(1.007)
Observations	195	193	198	198	198

* $p < 0.10$,   ** $p < 0.05$,   *** $p < 0.01$

Note: Robust standard errors in parentheses

None of the models above estimates a significant effect of being treated in the experiment, although it is weakly correlated with desired consumption, expected salary in the job selection, relative social status, and life satisfaction. The opposite trends are estimated for previous social media usage. The models find desired consumption, expected salary, and life satisfaction to be negatively correlated with previous social media usage with significance.

Relative social status & Life satisfaction

The utility of social status has been found to be relative in nature and depend on

reference points (Clark et al. 2008). Since the pre-study validated that the social media videos portrayed high social status, one may expect that treatment has a negative impact on self-reported relative social status.

The core problem of this study is to understand the preferences and utility functions of people. To get knowledge about the general impact of social media on human well-being, the study also estimates determinants of life satisfaction. The effects of a short social media treatment on life satisfaction are not predicted to be large, but if the hypothesis of reference-dependency is correct, one would predict that life satisfaction decreases for treated participants.

Table 6 below presents estimation results from models 5 & 6 with relative social status & life satisfaction as outcome variables. Both variables are estimated with a model of reference-dependency and a model of the total treatment effect, separated by columns. In the reference-dependent models, C_{ref}_T is the variable of interest, similar to in Table 4. In the direct treatment models to the right, treatment is the variable of interest, capturing the effects of social media usage in the experiment.

The hypothesized effect of the social media treatment is again found insignificant in all models in Table 6. Apart from that, the models find consumption desires to be highly correlated with relative social status, while the age and previous social media usage of participants are estimated with significant negative relationships to life satisfaction.

Table 6: Relative Social Status & Life Satisfaction

Social Status / Life Satisfaction	Social Status (5)		Life Satisfaction (6)	
	Reference	Direct	Reference	Direct
C	1.67e-5***		1.41e-6	
	(5.58e-6)		(6.88e-6)	
C_{ref}	-3.62e-6		-1.05e.5	
	(3.25e-5)		(4.01e-5)	
C_{ref_T}	-2.77e-5		-2.34e-5	
	(4.20e-5)		(5.18e-5)	
Treatment	0.483	0.152	0.426	0.205
	(0.563)	(0.227)	(0.694)	(0.263)
SM		−0.009		−0.028**
		(0.010)		(0.011)
Age		−0.083		−0.155***
		(0.032)		(0.038)
Female		−0.2482		0.087
		(0.228)		(0.264)
Urban		0.006		0.007
		(0.004)		(0.0046)
Constant	5.112***	7.268***	6.471***	9.858***
	(0.420)	(0.915)	(0.516)	(1.007)
Observations	196	198	196	198

$^{*} p < 0.10, \quad ^{**} p < 0.05, \quad ^{***} p < 0.01$

Note: Robust standard errors in parentheses

In summary, the null hypothesis of no treatment effect cannot be rejected for any of the four alternative hypotheses. The estimations provide some indications that the social media treatment induces people to have increased preferences for salary

when choosing jobs and positively affects consumption desires, but not through raising the reference points observed in the study, since some models suggest negative relationships between variable C_{ref} and the treatment status. Previous social media usage seems to negatively affect consumption desires, salary preferences, and life satisfaction.

Chapter 6

Discussion

The study cannot confidently answer the research question of whether social media usage affects consumers through raised reference points since it cannot reject the null hypothesis of no effects between the exogenous social media treatment and desired consumption, salary, social status, or life satisfaction. There are two possible explanations for this: either the effect does not exist in reality, or the study's methodology was insufficient to observe it. This chapter explores both of those possibilities and discusses possible interpretations of the indications provided by the results of this study. Considering the theoretical background, the indications found, and the methodological limitations of the study, there are reasons to remain curious about the hypotheses outlined, despite the insignificant estimation results.

The results of the study are relevant in a discussion about global social media usage in general. As validated by a pre-study, all treatment videos were interpreted as highly representative of social media usage in general (see Appendix A). However, given the large variation in social media content available online, it is important to note that the social media content used in this experiment was limited to the most followed accounts (in Sweden and globally), which naturally portrayed the lives of relatively wealthy people.

As outlined in the introduction, the core premise of the study is that the utility individuals draw from economic activities depends on reference levels. This study

investigates whether those reference points are affected by social media consumption. The predicted effects from being treated with social media content, portraying the lives of people with high economic status, is that reference points increase, resulting in raised desires for future consumption and salary. If this effect is sufficiently strong, one would expect total utility and life satisfaction to decrease as a result. These predictions originate from previous studies on reference points (Kahneman and Tversky, 2013) (Paul and Guilbert, 2013), and social media (Abeler et al., 2011) (Appel et al., 2016).

Findings

Although none the null cannot be rejected in any of the four alternative hypotheses as all relevant treatment effects were found insignificant, the study consistently finds positive correlations between consumption and salary desires in Model 1, 2, 3. However, nothing suggests that this potential effect is caused by changed perceptions about others' level of consumption.

There are opposite trends regarding the effects of previous social media usage. The models on consumption and salary preferences in Table 5 show significant negative effects from previous social media usage (although this variable is not exogenously varied). One explanation for this is that the social media content used in the experiment differs from the content the participants usually watch. Although the pre-study confirmed that all treatment videos were highly representative of social media consumption, the treatment was biased in the sense that it was limited to content from the most followed social media accounts. Since there are no clear geographical constraints in interacting with people digitally, social media usage may bring new information about the lives of people far away from the user. The subject pool of Swedish students is presumably relatively wealthy and has in general relatively high reference points in terms of economic standards of living compared to the rest of the world, based on the economic conditions of Sweden. Hence, general social media usage may have the net effect of lowering reference points for Swedish people, given that they would consume social media content portraying the lives of

people with lower economic statuses on average.

The variable capturing the reference point of perceived consumption levels of other people, C_{ref}, was not found to be significantly affected by the social media treatment in Model 3. One explanation is that the survey question regarding the perception of others does not capture the true reference people's preferences really depend on. However, there was a strong significant relationship between desired consumption and the perception of others' consumption shown in Model 3 and Figure 6, suggesting that the effect of reference-dependency corresponds to the theoretical predictions. Another explanation is simply that people's perceptions about others' consumption are not affected by watching the type of social media content included in the treatment, and that connection may be flawed. It is possible that social media usage influences people through reference points not captured in the question about the perception of others' consumption. People may be affected by social media usage through other forms of internal expectations and perceptions not directly linked to external information about other people.

Studying the determinants of life satisfaction may give insights into the properties of the utility functions of people. The estimations of Model 6 do not find any significant relationship between self-reported life satisfaction and being treated in the experiment, but previous social media usage is found to have a negative effect. This difference may be due to the short time of treatment compared to other a full week of previous social media usage. The difference in effects from the treatment and previous social media usage may also be explained by differences in the type of social media content consumed before and during the experiment. If social media consumption, in certain situations or generally, decreases life satisfaction, it would correspond to the core hypothesis that it affects utility by raising reference points.

No effect?

One possible explanation for why the study does not find clear predicted effects is that Swedish students, or people in general, are not influenced as predicted by

watching the lives of popular social media creators. Although those social media profiles are disproportionally popular in terms of followers, it is not certain their effects on consumers' reference points are as effective as when the interaction is between people with more similar lives. For instance, it may be the case that reference points are more sensitive to the interaction with people one relates to or identifies with. Many of the most popular people on social media showcase the life of a celebrity, who may have little in common with the average consumer.

There could also be a fundamental difference between interacting with people online digitally compared to meeting people in person physically regarding the formation of reference points. It may be the case that watching other people on social media, independently of what their content portrays, does not translate to the perceptions in our own lives. The experience of consuming social media may have more similarities to watching a movie than meeting with people in this regard.

Finally, consumers may be aware of the bias in wealth portrayed on social media and rationally account for it when shaping their own perceptions and desires. If people are sufficiently aware of the distribution of income and form their economic references rationally, consuming social media would not be affected by watching the lives of people with high-end economic lifestyles.

Methodological limitations

There were limitations in the method of the study noted prior to the experiment, such as participants only being treated with social media for a few minutes, the possibility that a large part of the effect already occurred by previous social media consumption, and that reference points and its effects are subtle and difficult to observe in a short survey. For instance, the average participant consumed over 16 hours of social media the week prior to the experiment (see Figure 1), meaning that the ratio of social media consumption in the experimental treatment is small. One of the difficulties in observing reference points is that they seem to be influenced by a complex set of determinants of the environment one is surrounded with. It

is not clear whether people themselves know what references their preferences are influenced by, meaning that a study like this may only capture part of the impact of reference points. Taking the methodological limitations into consideration, there is a possibility that another study with a similar research question but greater scope and resources would find significant results corresponding to the theoretical predictions outlined in this study.

First-person experience

The findings of this study raised a potential alternative hypothesis about the fundamental effects of social media consumption. The experience of watching social media content portraying the lives of other people may be a first-person experience as opposed to a third-person experience. While interacting with other people physically, we naturally perceive the event from our own perspective and clearly distinguish between ourselves and others. Pictures and videos on social media are often captured from a first-person view, with the camera pointed away from the creator to showcase the environment the person is in. Hence, it is possible that the social media consumer partly perceives the content as themselves experiencing it in first-person. As an example, when really captured by a horror movie, the scary scenes filmed in first-person cause the viewer to be afraid, perhaps because parts of us interpret it as if we were in the dangerous situation ourselves. There are many instances where people react to video content as if they were present in the experience of the content, sad events in movies may induce us to cry, the atmosphere at sports events transfers through the TV screen, and the demand for pornography makes it clear that we are not always good at distinguishing between the event we watch digitally and our situation in the real world.

The potential impact of reference points is applicable even if this hypothesis is true. Rather than the perception about other people's economic statuses, reference points may affect the utility function through expectations, as discussed and found in (Abeler et al., 2011). Expectations do not need to originate from the external perceptions of others, but rather from internal comparisons between experiences

over time, as distinguished in (Clark et al., 2008).

This hypothesis is consistent with the theoretical predictions on reference-dependent utility, with reference points as expectations and comparisons over time, as opposed to external comparisons to the characteristics of other people. Verduyn et al. (2017) distinguishes between passive versus active social media usage, and they observe positive experiences of active usage (i.e. posting something), but negative effects from social comparisons attributed to passive usage (monitoring the lives of others), which is found to have more persistent effects over time. The difference may be that there is a clear distinguishment between the subject and others when actively communicating through social media posting, while the passive monitoring of the lives of other people may affect us more similar to a first-person experience.

Distinguishing between active and passive social media usage could explain the ambiguity in the findings on social media's effects on life satisfaction. Several studies, for instance (Mosquera et al., 2020) & (Allcott et al., 2020), find positive effects on well-being from pausing social media usage over several weeks, while consumers showcase the positive utility it brings in their continuous demand for social media. Social media consumption through active usage may increase life satisfaction through the present experience, while passive usage induces negative effects over time due to reference points of expectations.

Implications and Contribution

Taking the theoretical and empirical background, the findings, and the methodological limitations into consideration, this study provides grounds for future studies to apply reference-dependent utility models to social media consumption. This paper contributes to the literature by providing background and some indications in support of the hypothesis that social media usage affects reference points in reference-dependent utility models. In particular, this study finds some evidence of a positive effect between certain social media usage increases desires for income and consumption, although this paper alone is insufficient to confirm the predicted effects of social

media usage.

Future research

Social media is a global phenomenon and its potential effects on human well-being would be affecting billions of people across the world. This study and previous findings justify further attention on social media and its effects on the decision-making and well-being of people. Given the diversity of social media consumption it is important to control and decompose different effects from different types of usage. To draw conclusions about the aggregate effects of social media usage, future studies mapping the type of content presented on social media would be helpful for future studies.

One topic for future studies is to further understand the experience of social media consumption in detail. In order to capture the potential effect of reference points formed on social media fully, one needs to correctly define how reference points are affected. Does social media increase reference points by providing new knowledge about the characteristics of other people, or by affecting internal expectations based on one's experiences on social media?

This study is limited to observing social media's effects on perceptions and hypothetical economic decisions. Future studies could study the effect in a real-world setting, where actual economic decisions are observed while treating with controlled social media content.

6.1 Conclusions

In investigating the research question of social media's impact on reference points and economic desires, the study cannot reject the null hypothesis of no treatment effect in any of the models. Being treated with popular and representative social media content portraying lives with high economic status is consistently linked with higher consumption and salary desires, although the estimated effects are weak and few of the variables are significant in the models. There is no evidence that those effects arise from affected reference points in terms of perceived consumption among other people. It remains unclear how social media affects other reference points in

other aspects, but this study may contribute as a ground for future hypotheses about how social media usage might affect the economic perceptions, decision-making, and well-being of people.

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Appendix A

Pre-study

The table below summarizes the questions and answers from the pre-study. The columns Treatment and Control show the average answer across all videos in the two respective groups. 94% of the answers regarding the four treatment videos portray the life of a person, while only 11% said the same about the control videos. The treatment videos were found to be representative of social media content to a much greater extent than the control videos. The pre-study confirms the study's interpretations of the videos.

Questions for each video			
Question	Unit	Treatment	Control
Does this video portray the life of a person?	Yes, No	0.94	0.11
Please rate the following videos based on the economic standard of living they portray.	0 - 10	8.50	-
Please rate the following videos based on the relative social status they portray.	0 - 10	8.24	-
Please rate the following videos based on the life satisfaction they portray.	0 - 10	7.96	-
How representative is this video's content of what people consume on social media?	0 - 10	8.19	2.39

Appendix B

Main survey

B.1 Creation and Distribution

The survey was created and distributed using the online services of Qualtrics. An email was sent to the subject pool of 9586 students. The email read as follows:

//

Hi!

I have created a survey for my Master's project consisting of a few short videos and questions, and every respondent has a chance of winning 1 000 SEK. The money will be paid out through Swish within 15 days of completing the survey. The survey takes about 6 minutes to complete and does not require any preexisting knowledge.

Follow this link to the Survey:

Or copy and paste the URL below into your internet browser:

Follow the link to opt out of future emails:

By spending a few minutes to complete the survey, you give yourself a chance of winning money, contribute to research about people's behavior, as well as helping me out personally. Thanks in advance!

Elias Filhage Wahlström,

University of Gothenburg

//

An additional email reminding people of the experiment was sent one week later, with similar content.

B.2 Survey instructions

The following statement was presented at the first page when entering the survey.

//

This is an experiment about the interaction between people and different types of video content. The survey consists of a few videos and questions, and is expected to take about 6 minutes to complete.

On the following pages, you will be presented with four videos you should watch. Each video is followed by a question. For each correct answer, you are awarded one ticket to a lottery where the winner receives 1 000 SEK. The video experiment is followed by a few questions about you. The prize will be paid out through Swish, and the objective questions that are part of the lottery are marked with '[P]'.

All answers are completely anonymous, with the exception of an optional text field at the end of the survey where you may submit a Swish number to receive the prize. All numbers will be deleted within 15 days after completing the survey.

//

B.3 Treatment and control effects

The videos shown to the treatment group at the beginning of the experiment was selected based on three simple parameters.

Popularity. All treatment videos are from the 15 most popular social media accounts, in Sweden and globally, on each respective platform. *Recency.* All videos are among the most recent videos from the social media creator at the time of the experiment. *Content.* All videos fit with the definition of social media consumption, i.e. videos portraying the life of other people.

The following is a list of all social media accounts that were included in the treatment effect. The selection of videos is arbitrary to some degree, hence all interpretations are confirmed by a pre-study.

Table 7: Social media accounts

Account	Followers	Popularity rank
Instagram		
annanystrom	8.3Millions	5th[*]
zaralarsson	8.2Millions	6th[*]
koenigsegg	4.4Millions	9th[*]
kyliejenner	391Millions	3rd
cristiano	584Millions	1st
Youtube		
Familjen Lundell	1Million	2nd[*]
Bianca Ingrosso	0.41Million	10th[*]
therese lindgren	1Million	1st[*]
TikTok		
charlidamelio	150.6Millions	2nd
therock	70.8Million	10th
addisonre	88.7Million	4th

* In Sweden

Note: Sources: XXX

The videos shown to the control group are defined solely by not portraying people's lives and not being representative of social media consumption, as confirmed by a pre-study. The four videos were clips from animals, artistic scenery, an animated movie, and a video explaining quantum mechanics.

B.4   Survey questions

Survey questions	
What is your desired level of monthly consumption in the future? [1]	SEK
What is the average level of monthly consumption among people your age in Sweden? [1]	SEK
What is the percent chance you would choose each of the following jobs? [2]	
Job A: Wage: 32600 Hours: 33 Risk: 5%	Probability
Job B: Wage: 21500 Hours: 29 Risk: 2%	Probability
Job C: Wage: 34700, Hours: 40 Risk: 1%	Probability
What is the percent chance you would choose each of the following jobs? [2]	
Job A: Wage: 28700 Hours: 36 Risk: 1%	Probability
Job B: Wage: 37400 Hours: 44 Risk: 4%	Probability
Job C: Wage: 35500 Hours: 41 Risk: 3%	Probability
What is the percent chance you would choose each of the following jobs? [2]	
Job A: Wage: 43700, Hours: 39 Risk: 2%	Probability
Job B: Wage: 70000, Hours: 46 Risk: 7%	Probability
Job C: Wage: 84900, Hours: 54 Risk: 8%	Probability
Please answer the number on the ladder where you think you stand at this time in your life, relative to the other people in Sweden. [3]	1 - 10
How satisfied are you currently with the following areas of your life?	
Personal income	1 - 10
Leisure time	1 - 10
All things considered	1 - 10
Approximately how many hours did you spend on the following social medias in the last week?	
TikTok	Hours
Youtube	Hours
Instagram	Hours
Which of the following responses best describes the area in which you mostly lived in or were raised in while growing up? [4]	0 - 100
How old are you?	Years
What is your gender? [5]	1, 2, 3
A number connected to Swish of your choice, for receiving monetary prizes.	Number

[1] The following definition was included: Consumption should be interpreted as the amount of money spent in total the average month, in SEK.

[2] Additional instructions: You will now be shown hypothetical job offers. Each job offer is characterized by: (1) Annual earnings when working full-time, (2) Full-time work hours per week, and (3) Probability of being fired (and unemployed for a year). These jobs are otherwise identical in all other aspects. Imagine you are 30 years old. You have been offered each of these jobs, and now have to decide which one to choose. In each scenario, you will be asked for the percent chance (or chances out of 100) of choosing each of the alternatives. The chance of each alternative should be a number between 0 and 100 and the chances given to the three alternatives should add up to 100 in total. This is based on Wiswall and Zafar (2018).

[3] Additional instructions: Think of this ladder as representing where people stand in Sweden. At the top of the ladder are the people with the highest social status. At the bottom are the people who are the people with the lowest social status. The higher up you are on the ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.

[4] The interval 0 - 100 was described as ranging from rural to urban.

[5] A third option "Prefer not to say" was included. Three participants chose this option which counts as missing observations.