# Master Thesis

*Unrealistic optimism in career decision-making:*

*"Maintaining a biased view of your future career, in the face of reality."*


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## Abstract

**Unrealistic optimism provides both enormous benefits to society, as well as it provides great challenges. In past research, it is shown that students are often unrealistically optimistic about future career-related events. Unrealistic optimism has significant negative financial consequences on a personal level and on a society level. This research has attempted to demonstrate this degree of unrealistic optimism for a very specific group: journalism students (n=96). Furthermore, it is tested whether providing students with information about the highly challenging labour market situation for journalists the treatment group (n=50) helps in reducing unrealistic optimism. The results have shown that students are indeed unrealistically optimistic about future career-related events. Then, a gender difference is measured with respect to the impact of the information intervention: the degree of unrealistic optimism with male students in the treatment group is significantly, positively impacted by the intervention, whereas female students aren't impacted at all. The first result fits the hypothesis, but the second result is somewhat surprising. A number of possible explanations for these results and corresponding policy recommendations will be outlined in the conclusion of this study.**

## Introduction

Due to technology advancements, institutional restructuring, the economic crisis and more global developments, labour market dynamics are evolving rapidly. As a result, there is a great excess supply of labour in some sectors of the labour market (Brynjolfsson & Mcafee, 2012; Frey & Osborne, 2013; Mack, 2014). One of these sectors is the sector for journalists. It has been found that in the Netherlands, the number of registered unemployed, graduated journalists has recently hit a record high (Kivits, 2015; Rijken, 2012). However, at the same time, there are more than a handful of study programs nationwide that are taking in new applicants each year, even with a ballot system, because the demand for these study programs greatly exceeds the supply. This is a worrisome trend. Next to this, there is a conflict of interest between the educational institutions providing these study programs and the prospective journalism students. The interest of the educational institutions in the Netherlands is to let as many students as possible go through the program and graduate, because the government funds them based on a per-student fee (Witlox, 2013). The interest of the students is different: students want to pursue a career in which they will do a job that fits their skillset, their passion and which gives them the economic means to lead a stable and happy life. What currently happens, is that educational institutions keep accepting new students into their study programs, because of the interest previously described, while at the same time knowing that the majority of the students will most likely experience serious difficulties with pursuing their first interest (as previously described) after graduation.

Additionally, students seem to be either unaware of the prospective labour market situation in their sector (and its associated challenges), or they seem to misestimate the possible impact of this situation on their future lives (Kivits, 2015; Rijken, 2012). The latter can also be labelled as 'unrealistic optimism'. What role does unrealistic optimism play in the worrying situation that many (journalism) students will find themselves in after their graduation? What can and should educational institutions and policy makers do to mediate the possible negative effects of unrealistic optimism for graduates in many different sectors? These are questions that will hopefully be answered in this study, by looking at a specific case of a sector that clearly finds itself in a challenging situation.

In this research, the focus will be to measure the degree of unrealistic optimism in career decision-making, by looking at the specific case of the journalism sector. Furthermore, the effectiveness of providing students with information about the future labour market in intervening with their degree of (unrealistic) optimism will be explored.

There has been much research on unrealistic optimism in the domain of behavioural economics, which has explored the degree of unrealistic optimism for health-related affairs and business ownership. Some studies have looked into unrealistic optimism related to job perspectives, future salaries and other career-related issues. (Cohn, Macfarlane, Yanez, & Imai, 1995; Dawson & Henley, 2013; Gerrard, Gibbons, Benthin, & Hessling, 1996; Gerrard, Gibbons, & Bushman, 1996; Greening & Chandler, 1997; Hampson et al., 2000; Lench & Bench, 2012; Shalev, Keil, Lee, & Ganzach, 2014; Tali Sharot, Korn, & Dolan, 2012; Van der Velde & Van der Pligt, 1991; N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995). Though, there hasn't been found one study so far in the behavioural economics field, which was entirely focused on career decision-making (past studies generally had a more widespread research interest) and which used a research sample of subjects from a focused job sector (past studies generally used subjects from a very wide number of fields), which has very insecure and unfavourable future labour market perspectives. The described gap is filled by this research. The findings of this research can be used by policy makers and educational institutions, not only in the journalism domain, to become aware of the problem of unrealistic optimism among students and to design measures which can prevent or reduce the effects of unrealistic optimism among students in the future.

## Literature review

### Definition of unrealistic optimism

Unrealistic optimism is a phenomenon in which people tend to overestimate their own probability to avoid being unfortunate in different matters in life. Examples of these matters from previous research are disease, criminality or accidents (N. D. Weinstein, 1980, 1982). Another definition is: an underestimation of the likelihood of experiencing negative events, or an overestimation of the likelihood of experiencing positive events (Campbell, Greenauer, Macaluso, & End, 2007; D. M. Harris & Guten, 2010; Kirscht, Haefner, Kegeles, & Rosenstock, 2015; Otten & Pligt, n.d.; Running, Ligon, & Miskioglu, 1999; Tali Sharot et al., 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995). The misjudgement of the occurrence these future events, can have harmful consequences on people's lives and society in general. However, unrealistic optimism can also have widely positive consequences on the outcome of events in people's lives. In this case, they are mostly called 'self-enhancing biases', where optimism in many cases leads to positive outcomes on personal health and achievement (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996).

### Relevance of unrealistic optimism

#### *Upsides of a high degree of (unrealistic) optimism among students*

People who possess a higher degree of optimism tend to think (either justly or unjustly) that positive outcomes of certain future events are more likely to happen to them than negative outcomes of the same future event. This brings forward many positive features for society and is in fact one of the main drivers of capitalism. Most inventors, innovators, entrepreneurs and other important figures in our society are real optimists (Kahneman, 2012). Therefore, it is on the one hand very promising to see that unrealistic optimism is present in most of the current generation youngsters when it comes to their view on their future lives and successes (Arnett, 2000).

It is even shown in several studies in the past, that unrealistic optimism is a requisite for being a happy person (Taylor & Brown, 1988). These and other studies have revealed that people suffering from chronic depression didn't possess an optimism bias, while people who didn't suffer from depression were mostly unrealistically optimistic (Chambers & Windschitl, 2004; Helweg-Larsen & Shepperd, 2001a; Korn, Sharot, Walter, Heekeren, & Dolan, 2014).

Findings like these show us that a natural degree of (unrealistic) optimism is crucial, even for the mental health of society.

Then, there are also many upsides of (unrealistic) optimism more on the personal level. Unrealistic optimism reduces stress and anxiety associated with negative expectations and it enhances explorative behaviour (Tali Sharot et al., 2012). Besides, it has been found that MBA students who are unrealistically optimistic experience significantly better job search outcomes than pessimists with a similar skillset. They are more picky and they are more likely to receive a promotion (Robinson, Massey, & Kaniel, 2010).

### *Downsides of a high degree of (unrealistic) optimism among students*

Paradoxically, the same unrealistic optimism that is driving our capitalistic society to thrive, is also causing the young generation to be in trouble and this generation therefore should be encouraged to be very wary about their degree of unrealistic optimism (Arnett, 2000; Kahneman, 2012). The following few societal matters illustrate the possible consequences of unrealistic optimism in specific circumstances. At the same time, these matters underline the relevance of this research and in the next section the literature relating unrealistic optimism directly to career decision-making will be reviewed.

A small body of research has been done on the degree of unrealistic optimism and the dynamics of business ownership (which could essentially be labelled as a form of career decision-making). The results of these studies show that unrealistic optimism is strongly associated with a higher transition into business ownership. Furthermore, a higher degree of unrealistic optimism is associated with lower rates of subsequent duration of business ownership (Dawson & Henley, 2013). In other words, individuals who are to a higher degree unrealistically optimistic are more likely to start a business and more likely to quickly go out of business. What is also a very interesting finding, is that business owners with previous experience(s) in business failure aren't reducing their optimism bias with respect to future business success (Ucbasaran, Westhead, Wright, & Flores, 2010). So even in the face of reality, entrepreneurs seem to still be biased when it comes to future success prospects. Going out of business often carries significant financial risks and therefore confirms the finding that unrealistic optimism carries risks for an individual's (financial) well being.

Next to the issue of independent business ownership, unrealistic optimism also affects individuals who run into unemployment. Policy makers should carefully take unrealistic optimism into account when designing systems for unemployment benefits and private firms should equally take it into account when designing unemployment insurance packages. A recent study has showed that unemployed job seekers greatly overestimate the pace in

which they will find a new job. If unemployment benefits partly become privatized, consumers themselves (who are optimistically biased) have to evaluate their chances of becoming unemployed by themselves (in order to determine the private unemployment insurance package) and will be likely to be very much in trouble as a result, because their predictions are biased (Spinnewijn, 2010). In this case, policy makers have to find a solution to get their citizens out of trouble. The latter will be needed, but very costly.

There has been a small number of studies on the relationship of unrealistic optimism and the magnitude and seriousness of student debts. One thing is for sure: student debts are and will be a serious problem in the near future for (almost) graduates of a university education. The average student debt in the Netherlands currently is around €15.000 for each student and has been increasing in the last couple of years (Rusman, 2014). Since the government has decided to impose the new borrowing system, in which the student will only get study financing as a loan, instead of as a gift, this figure will likely become larger in the upcoming few years. According to several studies, this problem is mainly caused by a high degree of unrealistic optimism about future career prospects among university students. Students turn out to substantially underestimate the time in which they will pay back the student debt and students also overestimate their salary, relatively to other students. Next to this, students continually overestimate their chances to get full-time, study-related employment, immediately after their graduation (Seaward & Kemp, 2000; Tali Sharot et al., 2012; Simpson, Smith, Taylor, & Chadd, 2012). Furthermore, students also show an optimism bias with respect to their credit card spending, as they turn out to spend way more than they are actually able to afford, representing an unrealistically optimistic stance towards paying off their credit card debts (Norvilitis et al., 2006). Due to the relatively challenging labour market conditions in many sectors in the current economy, this unrealistic optimism among students poses a real challenge. If students would be less optimistically biased, they would perhaps be more careful in terms of finances and they would be more rational in making decisions for their future career. These findings underline the relevance of this research, because it attempts to verify the unrealistic optimism amongst students in the specific area of career decision-making, for an accurately specified target group in an extremely challenging sector in the economy. If there is one group of students who should be very wary in planning their future career and keeping track of their finances, it should be the target group of this research (journalism students). This approach hasn't been taken in previous studies.

## Discovering unrealistic optimism

### *Factors that affect unrealistic optimism*

#### Desired end states of comparative judgment

It is found in previous research, that the degree of perceived desirability related to a future event strongly influences the degree of (optimism-) biasedness around this event. In other words, if the future event is judged as 'very negative', a person's perceived probability of this event happening to him/her will be underestimated more than if an event is judged as 'a little bit negative'. People tend to view their risks for future events as less than others, because they think that this is what the world around them likes to see. A second factor besides perceived desirability of a future event is the perceived probability of an event. For this factor holds the same dynamic as for perceived desirability. A third factor concerns previous experiences of people. If people previously have had experience with a certain positive event, they tend to overestimate the probability of this event happening to them again. A fourth factor influencing the phenomenon of unrealistic optimism is perceived controllability over the future event. If people have larger perceived control over the outcome of a future event, they tend to overestimate their chances of succeeding (or avoiding the negative consequences) of a certain event, more when they have lower perceived control. The fifth factor influencing the severity of unrealistic optimism is the existence of a stereotype person. If there is a certain stereotype to whom a negative event is likely to happen, people will tend to believe that their own chances for this event to happen are less than average. Another name for this cognitive mechanism, impacting unrealistic optimism, is the 'representativeness heuristic' (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). The above factors are related to 'desired end states of comparative judgment' and are said to be important factors causing unrealistic optimism. These five factors mainly have to do with phenomena such as 'self-enhancement', self-presentation and 'perceived control' (Shepperd, Carroll, Grace, & Terry, 2002).

#### Cognitive mechanisms

There are some other important cognitive mechanisms impacting unrealistic optimism as well. These mechanisms are guiding judgments and decision-making processes in the brain of human beings. One of them is called 'singular target focus'. This mechanism is about the fact that people know more about themselves than they know about other people. People think about and judge other people as a single group and are insufficiently able to understand the group they are comparing themselves to. Therefore, people mostly ignore the average person in the group and primarily focus on their own feelings and experiences about

certain future events, which leads to biased judgments on future prospects (Shepperd et al., 2002).

Another cognitive mechanism contributing to the arousal of unrealistic optimism is 'interpersonal distance'. Interpersonal distance refers to the perceived risk differences that occur depending on how far or close the compared target (group) is to an individual subject in making risk estimates. The greater this perceived difference is for a subject, the larger it will estimate the perceived difference in risk between him/her and the associated target group. It is also argued that the more concrete a comparison target group is (so the less vague, for example a family member) the less biased the risk comparisons between the individual and the group tend to be. So, decreasing social distance for an individual subject from the comparison group will diminish the degree to which the person shows an optimism bias ( Gouveia & Clarke , 2001; P. . Harris, Middleton, & Joiner, 2000; Shepperd et al., 2002).

An alternative explanation to the phenomenon of unrealistic optimism is the degree of egocentrism of people. It is said that due to egocentrism, all the characteristics that influence our thoughts about our risk probability could introduce errors into our comparative risk judgments (N. D. Weinstein, 1982). This is a very relevant point, as it is important for people to objectively and accurately be able to assess the risks of future events, especially when it's about life and death. Relating to this research, it is very important that students are able to determine whether doing a certain study program gives them a reasonable opportunity for a financially stable career path.

The last factor impacting the optimism bias is 'underlying affect'. It has found in previous research that people who are in a positive mood show a higher degree of unrealistic optimism than people who are in a negative mood. Overall negative moods, like depression, will generate higher personal risk estimates but a lower degree of unrealistic optimism in general (Helweg-Larsen & Shepperd, 2001b). This is consistent with the findings about the relationship between mental health, depression and unrealistic optimism (Chambers & Windschitl, 2004; Helweg-Larsen & Shepperd, 2001a; Korn et al., 2014).

### *Measuring unrealistic optimism: Assessing the probabilities of future events*

In N. D. Weinstein (1980) and N. D. Weinstein (1982), it is mentioned that the most obvious way in which unrealistic optimism would present itself, is through an underestimation of the likelihood of experiencing a negative event. So, the actual risk of this event would be higher

than the personal estimate of this risk. There are two main problems in assessing unrealistic optimism, by this definition. Firstly, people are not able to accurately assess the personal risk for a future event, because it's very challenging for people to accurately collect and weigh the information on all the variables that influence the risk of the future event. Secondly, people have great difficulties in understanding and providing risk probabilities to events. The following research methodologies can avoid these two problems:

- Unrealistic optimism should be looked at on a group level. This means that one should ask individuals in a group to give a probability estimate of their personal risk for the future event relative to the risk of the other members of the group. An individual might be quite correct in estimating his chances of experiencing a favourable event as above average. However, if all people in a group claim that their chances are higher than average, it can be interpreted as a clear evidence of unrealistic optimism. That is why unrealistic optimism is investigated on a group level.
- Comparative, rather than absolute risk estimates is the most common research strategy in assessing unrealistic optimism. In this method, one researches whether people think their risk is lower (or higher) than that of their peers' risk, not whether it is higher (or lower) than the actual risk. This is the preferred method, because it is in general very difficult to assess the actual probabilities of future events.

This research method, which is comparative judgments of subjects about the perceived likelihood (in %) of future events, relative to the likelihood of this event happening to others, is also used as a methodology to detect unrealistic optimism in several other studies (N. D. Weinstein,1980,1982).

## Research question and hypotheses

At this stage, it is evident that students are to a large extent unrealistically optimistic about future events, also with respect to career related future events. It has also been concluded that previous attempts to intervene with unrealistic optimism by means of information provision about the likelihood of future events, have largely failed. The reason for this is that if students would be aware of the likelihood of future events, it is well known from literature about unrealistic optimism that they are likely to ignore challenging signals about their future, because of the phenomenon of unrealistic optimism (Greening & Chandler, 1997; Tali Sharot et al., 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980).

However, there hasn't been found a previous study, which attempted to test a specific group of students, which is in the face of bad labour market conditions. All target groups in past research have generally been very diverse and unspecific (students from all sorts of backgrounds). Will this very specific group of students still be unrealistically optimistic about their future career? Will information provision to these students indeed not help intervene their degree of unrealistic optimism, even with this very specific target group? Will different ways to intervene with the degree of unrealistic optimism be needed in the future? The findings from previous research in the 'literature review' lead us to the following to hypotheses for this study:

*Hypothesis 1: Journalism students exhibit unrealistic optimism towards positive and negative future events in career decision-making.*

*Hypothesis 2: The debiasing intervention, implemented in the questionnaire of the treatment group, will not influence the optimism bias relatively to the control group.*

## Methodology

### Methodological requirements for assessing unrealistic optimism

As has been mentioned in the literature review, research by Weinstein & Klein (1996) shows two clear methodological requirements for assessing unrealistic optimism. These methods have been used in a number of other important studies in the area of unrealistic optimism (N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). Therefore, these two requirements have been used in this thesis.

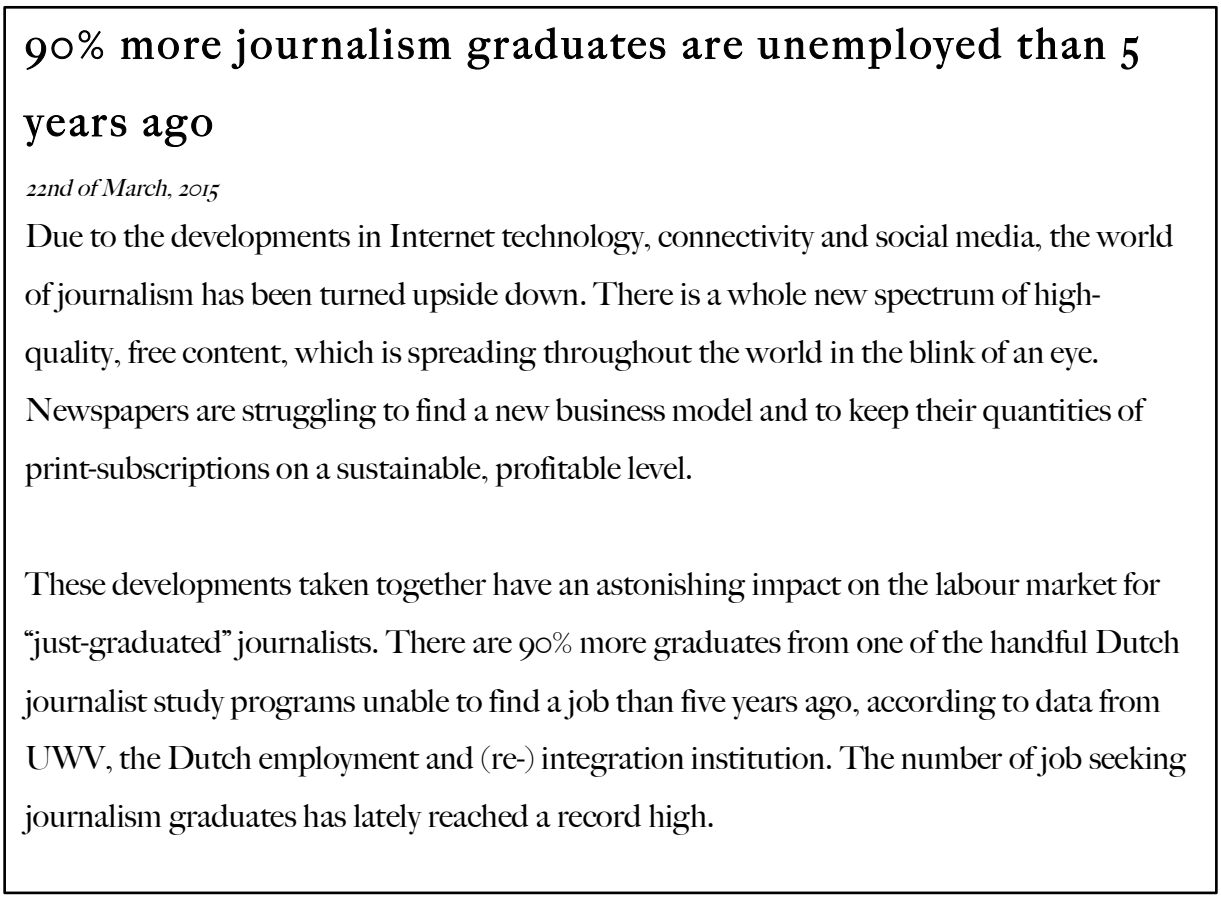
- Unrealistic optimism should be looked at on a group level.
- Comparative, rather than absolute risk estimates should be used.

### Participants and procedure design

First and second year journalism students from the different study programs in the Netherlands have been approached through an online questionnaire, using the web software 'Qualtrics' (www.qualtrics.com). Firstly, the student associations of these study programs have been contacted. Via the study associations, the students e-mail addresses have been obtained and they have been e-mailed with the survey. Furthermore, Facebook groups have been used to distribute the survey and reach the target group of subjects.

In this research, the sample has been divided into two groups: the treatment group (n=50) and the control group (n=46). The respondents (total n=96) have been randomly assigned from the sample to be either in the treatment or the control group. The treatment group will be confronted with a debiasing intervention in its questionnaire, while the control group will be asked to only answer the 8 questions, without the debiasing intervention. The intervention that is chosen in the research, is focused on taking away one of the drivers of unrealistic optimism: a lack of information about future events and a flaw in the information handling capabilities of human beings (N. D. Weinstein, 1980). Figure 1 below shows the debiasing intervention used to present to the control group.

*Figure 1: debiasing intervention used for the treatment group*



90% more journalism graduates are unemployed than 5 years ago

*22nd of March, 2015*

Due to the developments in Internet technology, connectivity and social media, the world of journalism has been turned upside down. There is a whole new spectrum of high-quality, free content, which is spreading throughout the world in the blink of an eye. Newspapers are struggling to find a new business model and to keep their quantities of print-subscriptions on a sustainable, profitable level.

These developments taken together have an astonishing impact on the labour market for "just-graduated" journalists. There are 90% more graduates from one of the handful Dutch journalist study programs unable to find a job than five years ago, according to data from UWV, the Dutch employment and (re-) integration institution. The number of job seeking journalism graduates has lately reached a record high.

### The research questionnaire

A questionnaire consisting of sixteen questions will be conducted. There will first be six introductory questions. Subsequently, there will be ten main questions. In each of these

questions, participants are asked to rate their chance of experiencing specified future events on a seven-point Likert scale (-3 = much below average, +3 = much above average), divided in positive and negative future events. The answers of the respondents to the main questions can be interpreted as 'relative to their colleague students'. This method and the associated survey questions have also been used in N. D. Weinstein (1980).

*Table 1: the preliminary questions in the research questionnaire*

**Please answer each of the following questions, 1 - 6:**

*(give an open answer to each of the questions 1 -6)*

Question 1: At which institution are you studying?
*Answer:*

Question 2: Which stage of your study are you in: bachelor or master?
*Answer:*

Question 3: Which study year are you in?
*Answer:*

Question 4: What is your gender? (male/female)
*Answer:*

Question 5: What is your age?
*Answer:*

Question 6: Do you want to a future career related to journalism? (Yes/No)
*Answer:*

*Table 2: the key questions in the research questionnaire*

## For each of the following questions, 7-16:

Compared to my colleague journalism students, what are the chances that the following events will happen?

*(Indicate your chances by answering one of the numbers, with -3 meaning 'my chances are much below average' and 3 meaning 'my chances are much above average')*

### Positive questions

Question 7: I get a job as journalist within 3 months after graduation.

*Answer:* -3 -2 -1 0 1 2 3

Question 8: I will get a full-time job in any sector within 3 months after graduation.

*Answer:* -3 -2 -1 0 1 2 3

Question 9: I will work my first job in the branch that I have studied for.

*Answer:* -3 -2 -1 0 1 2 3

Question 10: I will have an annual starting salary above €30.000,-.

*Answer:* -3 -2 -1 0 1 2 3

Question 11: I will repay my student debt within 7 years.

*Answer:* -3 -2 -1 0 1 2 3

Question 12: I will get a job offer in journalism before graduation.

*Answer:* -3 -2 -1 0 1 2 3

### Negative questions

Question 13: I will not repay my student debt within the time limit (15 years).

*Answer:* -3 -2 -1 0 1 2 3

Question 14: I will get fired from a job as journalist at least once during my career.

*Answer:* -3 -2 -1 0 1 2 3

Question 15: I will not get a job as a journalist within 6 months after graduation.

*Answer:* -3 -2 -1 0 1 2 3

Question 16: I will not get a full-time job in any sector within 6 months after graduation.

*Answer:* -3 -2 -1 0 1 2 3

## Statistical Analysis

In this section, the statistical methods with which the analyses have been carried out will be outlined and explained, for each of the two main research hypotheses. For a general description of the research sample Appendix 1 can be consulted.

*Hypothesis 1: Journalism students exhibit unrealistic optimism towards positive and negative future events in career decision-making.*

In order to test the first research hypothesis, a Wilcoxon signed-rank test and a one-sample T-test have been used. In doing the first test, the null hypothesis has been that the population mean ranks are equal to zero. If the first hypothesis completely holds, the outcomes (p-values) of this test will be significant for all of the questions (7-16) in the survey, at a 5% significance level. The Wilcoxon signed-rank test is the correct test to use in order to test the first hypothesis, since the data is non-parametric, it consists of repeated measurements on one sample and the Likert scale (ordinal data) has been used in the research survey (Lowry, 2014; McCrum-Gardner, 2008). For detailed results of the Wilcoxon signed-rank test, table 2.1 and 2.2 in the appendix can be used as a reference. In order to see whether, if indicated that the outcomes are significantly different from zero, the outcomes are above or below zero, it is sufficient to look at the sample means and see if the values are above zero or below zero (N. Weinstein & Klein, 1995). For example, in 2.1 in the appendix it can be seen that the journalism students are pessimistic on average when it comes to future annual starting salary (see column 'total sample means', question 10 = -0,66).

In the past research about unrealistic optimism, the two-sample T-test has been widely used as a tool to measure the significance of the effect of a debiasing intervention on the subjects' outcomes (N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995). Although theoretically (as described in the previous paragraph) there is a more robust test to compare the data of this kind, it is still decided to take past research as a benchmark in the statistical analysis. Therefore, the results of both methods (Wilcoxon signed-rank test and T-test) will be carefully compared in the 'Results' section. As will be seen next sections, the results are almost identical in both tests.

*Hypothesis 2: The debiasing intervention, implemented in the questionnaire of the treatment group, will not influence the optimism bias relatively to the control group.*

In order to test the second research hypothesis, a Wilcoxon rank-sum test (Mann-Whitney U test), a two-sample T-test and a Fisher Exact test have been used in the statistical analysis. In doing the Wilcoxon rank-sum test, the null hypothesis has been that the two samples (treatment group and control group) come from the same population. If the second hypothesis completely holds, the outcomes (p-values) for all of the questions will be significant, at a 5% significance level. The Wilcoxon rank-sum test is the correct procedure to test this hypothesis, since two independent samples are being compared, the data is non-parametric and the Likert scale (ordinal data) has been used in the research survey (Lowry, 2014; McCrum-Gardner, 2008). For detailed results of the Wilcoxon rank-sum test, the first table 3.1 to 3.3 (test for the entire sample, males and females) can be used as a reference.

For the same reason as with testing the first hypothesis, it has been chosen to do a two-sample T-test as a supporting verification to the first statistical test. Again as will be seen next, the results are robust in different tests.

The Fisher Exact test can be a very useful addition to the first two statistical tests that have been performed to test the second hypothesis of this research. The Fisher Exact test allows for testing outcomes in two different dimensions at the same time. More specifically, it allows a researcher to examine the significance of the association between two kinds of classifications. Furthermore, this test is more suitable to carry out with small sample sizes. In the case of this research that is not directly a challenge, but more valuable findings can be drawn from the data if small groups distribution of outcomes (for example: gender) can be compared (Yates, 1984). In the case of this research, the responses on each of the questions have been transformed into binomial data, by classifying responses above zero as 1 and responses below zero as 0. The latter procedure was needed in order to be able to do a Fisher Exact test. Then, the Fisher Exact test has been carried out for treatment/control group and above zero/below zero responses (conditional on gender, and bachelor/master level). It can be of large value to be able to extrapolate if gender or study level has a significant effect on the distribution of above zero/ below zero answers, because it can expand and possibly enhance the analysis of the first two statistical tests for hypothesis 1. The disadvantage of this analysis is that some of the responses are not included in the analysis, since the transformation caused the zero responses to be left out.

## Results

**Hypothesis 1:** Journalism students exhibit unrealistic optimism towards positive and negative future events in career decision-making.

### *Explanation*

The first priority of this research has been to discover whether journalism students exhibit unrealistic optimism towards (negative and positive) future events related to their career decision-making. Participants have filled out 10 questions in an online survey, about job perspectives after graduation, starting salary, the possibility to get fired from a job and about the repayment of their student debt. Table 2 in the 'Methodology' section gives a precise overview of how the questions looked like. The expectation has been that journalism students, as a group, would be overly optimistic with regards to positive events and negative events in their future career. In other words, it is expected that the subjects will underestimate downside risks and that they will overestimate upside prospects.

### *Results and discussion*

In this research, it has been found that journalism students are unrealistically optimistic when it comes to positive and negative future career-related events. This result can be clearly seen when looking at table 2.1 in the appendix. The first hypothesis can thus be confirmed. Table 2.1 shows that after conducting a one-sample median test (Wilcoxon signed-rank test) on the entire sample (n=96) for each of the relevant survey question outcomes, most of the p-values are below 0,05 and thus $H_0$ (sample median is equal to zero, in case of this research) can be rejected for the greater majority of the questions, except for question 10. These findings are consistent with the findings from the one-sample T-test, as can be indicated in table 2.3 and 2.4 in the appendix. There are no p-values, which are differing between the two different statistical tests, to such an extent, that our results should be debated. This underlines the robustness of the analysis in this research.

Though, the results regarding the first research hypothesis don't all point in the same direction. There are a number of important points that are worthwhile to mention. Firstly, the twelfth question, which asks the subjects to estimate their chances of getting offered a job as a journalist before graduation, gives a p-value of 0,9247 in the Wilcoxon signed-rank test on the total sample and a p-value of 0,2343/0,2755 on the treatment group/control group test.

This means that we can safely conclude that journalism students are very realistic (or modest) in their estimation with respect to optimism about a possible job offer before graduation. This finding is consistent with the findings from the corresponding T-test (see table 2.3 and 2.4) which show a p-value of 0,9525 and 0,2343/0,2976 respectively. It seems that they are very much aware of the challenging labour market situation in their sector, which might cause their neutral stance towards their perceived about a job offer before graduation. This explanation is related to perceived probability of the future event: the lower the perceived probability of the future event, the lower the degree of unrealistic optimism for subjects (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). Next to this explanation, it could at the same time be the case that the notion of 'getting offered a job before graduation' doesn't seem realistic to the respondents. The subjects are students and expect to be studying till after graduation. Therefore, the journalism students might have had difficulties with answering or understanding this question, which caused that the outcomes could be subject to a response bias and do not represent the actual outcomes (Furnham, 1986). Besides, the results indicated significant unrealistic optimism in a similar job related question (Q7), which is apparently a more realistic scenario (getting a job after graduation).

Secondly, the outcomes regarding the tenth question (e.g. I will have an annual starting salary above €30.000,-) are somewhat remarkable. Although, this question has been posed as one of the positive questions of the survey, the outcomes suggest otherwise. The respondents are relatively pessimistic with regards to their annual starting salary, as can be seen in table 2.1, where the sample mean is -0,66 and the $H_0$ hypothesis of a median equal to zero can be rejected, with a p-value on the Wilcoxon signed-rank test of 0,0001 (for the test on the entire sample, see table 2.1). The result from the first statistical test is consistent with the results from the T-tests. This means that with respect to future financial compensation, journalism students turn out to be significantly more conservative and even pessimistic about the chances of a positive event (in this case: an annual starting salary of €30.000,-) that will happen to them in the future. First, this result is most likely attributed to the students 'perceived probability' of the future event (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). If journalism students, because of the fact that they are aware of the challenging labour market conditions in their sector, don't expect to receive an annual salary (or even an annual starting salary higher than €30.000), the perceived probability of this event will be very low for most of the subjects. This may cause the absence of unrealistic optimism in the outcome for this question. This result might as well be driven by construal level theory. It has been found that abstract, high-level construal display of a future event induces greater optimism about this future event, whereas

concrete, low-level construal induces a lower level of optimism about future events (Shalev et al., 2014). The tenth question in this research is posed on a much lower construal level than the other questions, because a concrete annual salary value and a timeframe is mentioned. Whereas, in the other questions, the construal level is much higher, with formulations such as “after graduation” or “within 7 years”. These formulations are both less concrete and with a higher temporal distance and could therefore alter the perceived likelihood of this specific future event for the subjects. What should be mentioned with respect to the results of the tenth question, is that the outcomes in both of the statistical tests indicate that the subjects within the control group are significantly more pessimistic than the subjects in the treatment group, who are essentially neutral with respect to the future prospect of receiving an annual starting salary of €30.000. This is a counterintuitive finding that can’t be directly explained in this research. Another argument for the counterintuitive outcome for the tenth survey question could again be a result of response bias, since the questionnaire has been conducted in English (Graeff, 2003). Subjects predominantly didn’t have English as their mother language, which could have leaded to misinterpretation of the word ‘annual’ in the tenth question. For example, if a significant percentage of the subjects interpreted the word ‘annual’ as ‘monthly’, due to imperfect knowledge of the English language, this could have severely biased the outcomes of question 10.

Thirdly, in the control group outcomes (table 2.2) question 8 has a p-value of 0,6195 and a mean outcome of 0,02, which means $H_0$ can’t be rejected. In the treatment group outcomes for the same question, the p-value is equal to 0,0079 and the mean outcome is 0,54, which means $H_0$ should be rejected. This is consistent with the T-test outcomes on both control group and treatment group. These results firstly imply that students in the treatment group are not neutral (but optimistic) with respect to their chances of a job in any sector, within 3 months after graduation. Furthermore, it could imply that the debiasing intervention has had an influence here. It might have been the case that through reading the text excerpt with data on record unemployment in the journalist labour market, students became more optimistic about getting full-time employment in a different sector. This result can partly be explained through the perceived desirability of the future event (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). The subjects who were part of the treatment group most likely had an even higher perceived desirability of getting a certain job after graduation, as a result of the intervention. This might have increased the magnitude of their degree of unrealistic optimism. However, this can’t be proven by means of this paper and will therefore stay speculative.

It is still very remarkable, that the subjects in the treatment group seem more optimistic as can be seen from the mean outcomes (although not in each case statistically significant) than the subjects in the control group. Intuitively, the opposite outcome would be expected, namely that the subjects in the control group would be more optimistic.

**Hypothesis 2:** The debiasing intervention, implemented in the questionnaire of the treatment group, will not influence the optimism bias relatively to the control group.

### *Explanation*

The second goal of this research was to find out whether providing journalism students with information on the labour market circumstances in the sector significantly changes their degree of (unrealistic) optimism, relative to students who didn't get to see this information. The hypothesis has been that students who received the debiasing intervention (see figure 1 in the 'methodology' section) in the treatment group (n=50) would provide significantly less optimistic answers to the positive questions and significantly more pessimistic answers to the negative questions, relative to the students in the control group (n=46).

### *Results and discussion*

In table 3.1 to 3.3 in Appendix 3, the p-values of the Wilcoxon rank-sum test (Mann-Whitney U test) is shown for each of the survey questions, for the entire sample and for males and females separately. When comparing the control group and the treatment group, with all independent variables included (while separately controlling for gender and bachelor/master in separate tests), it turns out that all the questions except one signal an insignificant difference in the degree of optimism and pessimism between the control group and the treatment group of the research. This finding is consistent with the findings from the two-sample T-test and the Fisher Exact test, as can be seen in table 3.4 to 3.9 in Appendix 3. In all of the three statistical tests it becomes evident that the debiasing intervention provided to the subjects in the treatment group, for a large part, didn't have a significant effect on the degree of unrealistic optimism. The provision of information about labour market circumstances to journalism students seems to have very little effect on the self-reported degree of optimism towards future career-related events. We can conclude that the second research hypothesis can thus be confirmed. This finding does also underline the conclusions from the research of Weinstein (1980), where it has also been found that information provision has no significant effect on the optimism bias. Though, the research of Weinstein was substantially different, since the scope of the questions was much broader, also

considering health related issues and other questions. Furthermore, the target group of this research was less specific, as it concerned students from a very diverse set of courses at a university. In this research, it has been chosen to involve students from a very specific study field (journalism), with very specific survey questions, only considering career decision-making. The study field of journalism has been shaping the main hypotheses of this study, as the labour market situation in this field is especially challenging and therefore a relatively low level of optimism was expected among the subjects. However, these alterations don't seem to cause a substantial change in the results compared to the Weinstein (1980) study.

However, there are a few interesting findings when comparing the effect of the debiasing intervention in the entire control group with the treatment group. The p-value of question 10 is equal to 0,0173 and in this case the $H_0$ (the control group and the treatment group come from the same population) can be rejected. This finding is again consistent with the results from the two sample T-test and the Fisher Exact test. This means that the degree of optimism with respect to the annual starting salary after graduation differs (statistically) significantly between the treatment group of subjects and the control group of subjects. When looking at the means of the treatment group in table 2.2, it turns out that journalism students in the treatment group are more optimistic about their future annual starting salary than students in the control group. This is a very remarkable finding, as it is quite counterintuitive. One would expect that providing journalism students with information on the challenging situation in the labour market for journalists would trigger a response of less optimism relative to the case where the students were not provided with this information. Furthermore, it should be noted that the significant difference in optimism between control group and treatment group on the tenth question could be mainly attributed to a number of male subjects in the control group, since the comparison of females in both sample groups gives an insignificant outcome (see table 3.3, p-value for females, Q10 = 0,7086). According to this study, it seems that male journalism students are triggered to be less realistic (more optimistic) with respect to their optimism about future annual starting salary than female journalism students, when they are provided with an excerpt of text with information about the challenging labour market situation. This gender effect, triggered by the debiasing intervention, can be found in two more survey question outcomes.

The same pattern can be observed when looking at the outcomes of question 7, which is about if journalism students will get a job within 3 months after graduation. Male participants in the treatment group seem to be significantly influenced by the debiasing intervention, with the p-value for the three statistical tests being below 0,05. When considering the means for males in question 7; -0,067 in the control group and 1,105 in the treatment group, and

considering the fact that this difference is statistically significant (also for the medians), it can carefully be argued that the debiasing intervention makes the male subjects significantly less realistic and more optimistic about the prospects of getting a job within three months after graduation. This is especially remarkable when considering that the means for female subjects are insignificantly different from each other and carry the following values: 0,677 in the control group and 0,516 in the treatment group. The pattern found with comparing female subjects in both groups is much more logical and intuitive: the debiasing intervention seems to slightly negatively impact their optimism in answering question 7.

In question 9, which is about if students will get a job in the branch that they have studied for (journalism branch), remarkably again the same pattern is observed. Male subjects are significantly triggered to answer the question more optimistically when being presented with the debiasing intervention. This can be seen when looking at the test outcomes of the two most important statistical tests, with a p-value of 0,0389 in the Wilcoxon rank-sum test and a p-value of 0,0291 in the two-sample T-test. This indicates that both the medians as well as the means of observations of male subjects in the treatment/control group are significantly different. When looking at the values of the means (male mean CG Q9 = 0,133/TG Q9 = 1,316), it again shows males answer the question a lot more optimistically when they are part of the treatment group.

This basically means that the male subjects in the treatment group are significantly impacted by the intervention in the opposite way that was hypothesized, when self-reporting their optimism about getting a job within 3 months after graduation (Q7), when self-reporting their optimism about the chances relative to other students to get a job in the journalism field (Q9) and when self-reporting their optimism about receiving an annual salary higher than €30.000 (Q10). What could cause this somewhat surprising pattern?

First, an explanation for the surprising observation that subjects in the treatment group respond more unrealistically optimistic to three out of four of the first questions than subjects from the control group. The increased degree of unrealistic optimism as a result of giving the students risk information about future events is consistent with findings from past research (N. Weinstein & Klein, 1995). The explanation for this pattern comes from the prominent research on unrealistic optimism in the field of behavioural economics. Several important studies have found (and it has been described in the literature review under the category ‘desired end states of comparative judgment’) that defensive processing, also called ‘defensive denial’, of undesired risk information is highly associated with unrealistic optimism and seems to be (at least partially) responsible for triggering unrealistic optimism in some

cases (Radcliffe & Klein, 2002; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1982). In the observations in this research, it seems that subjects in the control group (especially males) are using defensive processing, at the same time stimulating them to be even more unrealistically optimistic when confronted with the debiasing intervention.

Then, an explanation is needed for the fact that male subjects in the treatment group seem to show a larger degree of unrealistic optimism than female subjects. In previous research, it has been shown that women indeed tend to be less optimistically biased compared to men and that men are in general less resilient when it comes to adjusting their judgments as a result of base rate information (such as the debiasing intervention) (Dejoy, 1992; Lin & Raghubir, 2005). However, it should still be noted that the debiasing intervention makes male subjects more unrealistically optimistic for some of the questions in this research. An explanation for this could have to do with self-enhancement. The debiasing intervention could trigger a higher degree of self-enhancement with the male participants. For this reason In previous research it is shown that males expose more self-enhancement than females (Kurman, 2004). Another explanation for the surprising sub-results of this research could have to do with a social, inter-generational issue. In a previous study with around 1500 subjects, it has been found that males perceive environmental health risks significantly smaller and more acceptable than females. The socio-political explanation given in the study is that males are optimistically biased about environmental health risks, because they have historically created, managed, controlled and benefited for large part of their greater power and control in this world (Flynn, Slovic, & Mertz, 1994).

As a last argument, the research field of evolutionary psychology can be of good use. According to research in this field, human beings have seven fundamental motives to live for (Griskevicius & Kenrick, 2013). With males, the motives of mate acquisition, mate retention, status and social affiliation are very strongly present. Having a positive future career perspective is an important feature for satisfying these fundamental motives with males, significantly more than with females, because females are from the evolutionary point of view not the wage earners within the family. For this reason, the desirability of the future event that male journalism students would not get proper employment (and would therefore not be able to satisfy the fundamental evolutionary motives) will probably be lower for males than for females. As we know from the research of behavioural economics, the lower desirability of the future event means a higher degree of unrealistic optimism for the subjects (Lench & Bench, 2012; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982). The prospect of an undesirable future event (e.g. not getting employment after graduation) is especially triggered with the debiasing intervention, which might explain the increasing degree of

unrealistic optimism for male subjects in this research, supported by the argument from evolutionary psychology. From a certain degree of pride and protectionism towards their social status, family and romantic partner, since these motives are by evolution more present in men than in women, male subjects are more inclined to engage to a larger degree in unrealistic optimism when it comes to future job prospects, especially in the face of reality (when presented with the debiasing intervention) (Griskevicius & Kenrick, 2013).

Although the latter result is worth further exploration in future research, one should be very careful with using and interpreting this result. The reason for this is that the sample size, especially for the male part, is very small (n=15 in control group and n=19 in treatment group). This could be an explanation for the counterintuitive result of the tenth question, since a very few outliers could cause this outcome to be found.

## Conclusion

Unrealistic optimism greatly impacts the decisions of individuals, in many areas in life. In the past couple of decades, a large body of research, mostly with students as subjects, has demonstrated that in the domain of health, entrepreneurship and professional careers, groups of people often are unrealistically optimistic in evaluating the likelihood of future events for themselves, relatively to other members of a group (Gerrard, Gibbons, Benthin, et al., 1996; Greening & Chandler, 1997; Lench & Bench, 2012; Tali Sharot et al., 2012; Stankevicius, Huys, Kalra, & Seriès, 2014; N. D. Weinstein, 1980; N. Weinstein & Klein, 1995). This unrealistic optimism embodies an interesting paradox. On the one hand, optimism (in many cases unrealistic) in itself is an important driver of the success of our current capitalist system and even seems to be a predictor and requisite for human health, both on the physical and the mental level. On the other hand, unrealistic optimism also seems to be a driving force in many challenges in our current society. Students, unemployed and business owners often get into deep financial trouble as a result of their high degree of unrealistic optimism (Arnett, 2000; Seaward & Kemp, 2000; Simpson et al., 2012; Spinnewijn, 2010; Ucbasaran et al., 2010). It seems that unrealistic optimism clearly is a two-sided coin and decision makers in our society should take both sides of this coin equally seriously.

### Main findings

This study has looked at the challenging side of the coin of unrealistic optimism for a very specific target group: journalism students in the Netherlands. In past research, it has already become evident that students tend to be unrealistically optimistic with respect to their future career prospects, in terms of salary, job opportunities and repayment of their student debts (Arnett, 2000; Norvilitis et al., 2006; Seaward & Kemp, 2000; Simpson et al., 2012; N. D. Weinstein, 1980). However, past research has not yet verified this for a specific group of students in a single sector, where it is clear that the current and future labour situation pose significant challenges for the future financial well-being and career success of graduates. The goals of this research have been to discover whether current journalism students in the Netherlands are unrealistically optimistic with respect to their career after graduation (hypothesis 1) and whether providing students with concrete information about the challenging labour market situation helps in mitigating the degree of unrealistic optimism (hypothesis 2), if the latter is found.

The main finding of this research is that journalism students in the Netherlands are indeed unrealistically optimistic with respect to future career-related events. The first hypothesis could therefore be confirmed. The research sample, consisting of 96 journalism students, has displayed unrealistic optimism about positive future career-related events (getting a job within 3 months after graduation, working in the branch that is related to the study program, repayment of student debt within 7 years and a job offer as a journalist before graduation). Unrealistic optimism has persisted among the subjects when looking at negative future career-related events (not getting a job in any sector within 6 months after graduation, not getting a job as a journalist within 6 months after graduation, no repayment of student debt within 15 years and being laid off from a job as a journalist once in their career). These findings are consistent with previous research on the topic of unrealistic optimism (Gerrard, Gibbons, Benthin, et al., 1996; Greening & Chandler, 1997; Lench & Bench, 2012; Tali Sharot et al., 2012; Stankevicius et al., 2014; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995).

Only one finding in testing the first research hypothesis did not display unrealistic optimism, which was about the chances of getting offered a job as a journalist before graduation. This could either have to do with the fact that the subjects perceived the probability of this event as very small and are therefore less unrealistically optimistic or the lack of reality in the

outcome of this question could have leaded to a response bias (Furnham, 1986; Graeff, 2003; N. D. Weinstein, 1980).

The second important finding of this study is that information provision about the challenging labour market situation in the field of journalism does only partly impact the degree of unrealistic optimism for the subjects. Therefore, the second research hypothesis couldn't entirely be confirmed. The cause for this is a small, but remarkable and possibly important nuance in the findings surrounding the second research hypothesis. According to the findings in this study, male journalism students seem to be significantly influenced by information on the labour market conditions of the journalism sector, when it comes to positive future career-related events. More specifically, male journalism students display a significantly higher degree of unrealistic optimism about their chances of getting a job as a journalist within three months after graduation, about their chances of getting a job in the study-related field and about their chances of receiving a starting salary of €30.000 or more after graduation, when first presented with information on the challenging labour market conditions in the domain of journalism. Female journalism students are not significantly influenced by the same information. This finding is in one part consistent with previous research on unrealistic optimism in other domains (e.g. health), where it has also been found that men tend to show a larger degree of unrealistic optimism than women (Dejoy, 1992; Flynn et al., 1994; Lin & Raghubir, 2005). Also the finding that information provision, meant as a debiasing intervention to decrease the optimism bias, has the complete opposite effect (for male subjects) isn't a new finding (N. Weinstein & Klein, 1995). Explanations for the increase in unrealistic optimism, due to the intervention, most likely have to do with the phenomenon of defensive processing (also called 'defensive denial') of undesired risk information, as have been described in previous literature (Radcliffe & Klein, 2002; Tali Sharot et al., 2012; Shepperd et al., 2002; N. D. Weinstein, 1980; N. Weinstein & Klein, 1995). However, the reason behind the fact that male students seem to be significantly more subject to the phenomenon of defensive processing than female students remains unclear from the past literature on unrealistic optimism. In this study, a few possible explanations have been brought up, reaching beyond the field of behavioural economics. First, the provision of information on the challenging labour market could trigger a higher degree of self-enhancement feelings for male students, which could lead to disproportionally high degrees of optimism. This would be consistent with previous research, which found that self-enhancement is found more within males than females (Kurman, 2004). Secondly, the increasing degree of unrealistic optimism as a result of the information provision could be attributed to an argument from evolutionary psychology. In short, it could be argued that males are by evolution more protective and inherently motivated towards sustaining their

(and their social surroundings') financial well being than females, because males have always had the task of taking care of their mate and families (Griskevicius & Kenrick, 2013). Making the link to related research, the activated evolutionary motives in male journalism students could have triggered a higher tendency of self-preservation/-enhancement or defensive processing of undesirable information of future prospects, compared to the female students and could therefore have lead to increased unrealistic optimism (Kurman, 2004; Lench & Bench, 2012; Radcliffe & Klein, 2002; N. D. Weinstein & Klein, 1996; N. D. Weinstein, 1980, 1982).

### Recommendations

First, this study has found that journalism students are indeed unrealistically optimistic about future career-related events. Then, this study has not completely confirmed past research findings (N. D. Weinstein, 1980; N. Weinstein & Klein, 1995) that information provision has no effect on the degree of unrealistic optimism is very interesting on itself. The measured positive significant effect of being a male on the degree of unrealistic optimism in the treatment group of this study hasn't been found before, to our knowledge. The finding that information provision is either not having a significant impact on students in a sector that has a very challenging future prospects, or has the opposite effect (at least for male students) should have direct implications for educational institutions and policy makers in the educational body of our government. Next to this, we now know that even in the face of the hard reality, students are still unrealistically optimistic with respect to their future career. This research has shown this for a specific group like journalism students, who have all the reasons (in terms of labour market conditions) to at least be careful in planning their future careers. Just providing students with the right information does not seem like the right solution to direct them into another study direction.

What do governments and educational institutions currently do to support students making the right choices for their future careers? At high school, students can visit the school's dean to get a personal advice for a future study program. The dean can, based on what the student likes the most, give the student an advice about its study choice. Other than that, at high school, students have to rely on their own en their parents' evaluative capacities to make a study choice that makes economic sense for the future. Afterwards, when students have chosen a program, they are left alone when it comes to making choices about their future careers and evaluating their possibilities on the job market. This is of course a problem. Students are individually not well able to evaluate probabilities and risks for future events (N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995) in their career and educational institutions will not do this for them, because it's not in their best interest.

Governments should step in to fill this gap, by creating a mechanism in which students get sufficient support in making a wise (in terms of future economic prospects) study choice and they can overcome their degree of unrealistic optimism, before it will cause them serious (financial) trouble.

So, what should this mechanism incorporate? What could be more successful debiasing interventions in preventing students to be unrealistically optimistic about their future career? In (N. Weinstein & Klein, 1995), it has been found that providing subjects with individually tailored risk information about future events, in a relative ranked standing to the risk of other specific subjects, did have a significant effect on decreasing the optimism bias. The effectiveness of using reference information of other people who are relevant to the subject, as a way to decrease the optimism bias, has been verified in another past study (Flyvbjerg, 2008). In the case of (journalism) students and their future career choices, this would be challenging, as the educational institutions together with the students are the only parties who would be able to provide the students with the correct information to determine the individual risk information and reference information on future career-related decisions. However, with the availability of data on the labour market situation in the specific sector, course grades, high school grades, extracurricular activities and student debt, a more individually tailored presentation of risk information (including relative ranking) could surely be provided. Especially with the help of current technology, educational institutions would surely be able to provide this to students. In more recent work from neuroscience by (T. Sharot et al., 2012), it has been shown that unrealistic optimism can be successfully intervened using brain stimulation techniques on individual subjects. The possibilities for universal application of these techniques in daily life are yet to be explored and implemented, but in the future these sorts of techniques might be a feasible way to intervene with unrealistic optimism.

To a certain extent, it is clear that regulators do have a responsibility to facilitate that young people make economically beneficial choices for their respective futures, as educational institutions will not do it for them. Next to this, labour market figures clearly show that many (journalism) students run into financial trouble as a result of not being able to find a job or not being able to pay-off their student debts (Kivits, 2015; Rijken, 2012). At last, it is evident that individuals themselves don't have the capabilities to sufficiently evaluate probabilities for future negative events in society to affect them individually (N. D. Weinstein, 1980, 1982; N. Weinstein & Klein, 1995). Different experiments with the previously mentioned (or other) methods need to be done by regulators in order to test which measures work in successfully intervening with unrealistic optimism. Optimism has obvious benefits for society and should

always be embraced and encouraged. However, when optimism (whether in career decision-making or not) becomes unrealistic, it can have serious consequences on people's individual welfare and well-being. The consequences of unrealistic optimism should therefore continue to be prevented.

### Future research

The finding regarding unrealistic optimism for the entire sample group seems robust in this research and has been found quite some times before. It seems to be evident that students are unrealistically optimistic when it comes to future career-related events. However, care should be taken in interpreting the second main finding of the study: the effect of information provision about labour market conditions on the degree of unrealistic optimism on especially male students. As can be seen in Appendix 1, the sample largely consists of female subjects and it is therefore challenging to draw separate conclusions from the outcomes of males in the sample. Although the effect of the debiasing intervention on the degree of optimism with male journalism students is significant, future research is surely needed to verify this effect with a larger sample size. It is very relevant to dedicate future research to this effect, because if it turns out that male students are to a larger degree unrealistically optimistic and actually respond differently to debiasing interventions than female students, different policy recommendations should be used for dealing with unrealistic optimism with both genders.

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## Appendix

### Appendix 1:

Summary statistics on samples of journalism students

| | **Treatment group (n=50)** | **Control group (n=46)** |
|---|---|---|
| *Age (years, mean)* | 22,1 | 22,0 |
| *Male (nr. of students)* | 19 | 15 |
| *Female (nr. of students)* | 31 | 31 |
| *Bachelor (nr. of students)* | 34 | 34 |
| *Master (nr. of students)* | 16 | 12 |

### Appendix 2:

**Table 2.1**

Hypothesis 1: Wilcoxon signed-rank test for both samples together (P-values, means)

Green = significant at a 5% level  Red = significant at a 5% level

| | **Total sample (TG+CG): p-values** | **Total sample (TG+CG): means** |
|---|---|---|
| *Question 7* | 0,0000 | 0,59 |
| *Question 8* | 0,0249 | 0,29 |
| *Question 9* | 0,0002 | 0,59 |
| *Question 10* | 0,0001 | -0,66 |
| *Question 11* | 0,0045 | 0,55 |
| *Question 12* | 0,9247 | 0,01 |
| *Question 13* | 0,0000 | -1,07 |
| *Question 14* | 0,0011 | -0,51 |
| *Question 15* | 0,0000 | -0,70 |
| *Question 16* | 0,0000 | -0,94 |

**Table 2.2**

Hypothesis 1: Wilcoxon signed-rank test for control/treatment group (P-values, means)

Green = insignificant at a 5% level Red = significant at a 5% level

| | Treatment group: p-values | Treatment group: means | Control group: p-values | Control group: means |
|---|---|---|---|---|
| *Question 7* | 0,0001 | 0,74 | 0,0232 | 0,43 |
| *Question 8* | 0,0079 | 0,54 | 0,6195 | 0,02 |
| *Question 9* | 0,0003 | 0,86 | 0,1190 | 0,30 |
| *Question 10* | 0,1749 | -0,32 | 0,0000 | -1,02 |
| *Question 11* | 0,0241 | 0,58 | 0,0819 | 0,52 |
| *Question 12* | 0,2343 | 0,26 | 0,2755 | -0,26 |
| *Question 13* | 0,0000 | -1,16 | 0,0003 | -0,98 |
| *Question 14* | 0,0082 | -0,56 | 0,0562 | -0,46 |
| *Question 15* | 0,0003 | -0,74 | 0,0020 | -0,65 |
| *Question 16* | 0,0000 | -1 | 0,0007 | -0,87 |

**Table 2.3**

Hypothesis 1: One-sample t-test for both samples together (P-values, means)

Green = insignificant at a 5% level Red = significant at a 5% level

| | Total sample (TG+CG): p-values | Total sample: means |
|---|---|---|
| *Question 7* | 0,0000 | 0,59 |
| *Question 8* | 0,0449 | 0,29 |
| *Question 9* | 0,0002 | 0,59 |
| *Question 10* | 0,0000 | -0,66 |
| *Question 11* | 0,0055 | 0,55 |
| *Question 12* | 0,9525 | 0,01 |
| *Question 13* | 0,0000 | -1,07 |
| *Question 14* | 0,0002 | -0,51 |
| *Question 15* | 0,0000 | -0,70 |
| *Question 16* | 0,0000 | -0,94 |

**Table 2.4**

Hypothesis 1: One-sample t-test for control/treatment group (P-values, means)

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: p-values | Treatment group: means | Control group: p-values | Control group: means |
|---|---|---|---|---|
| *Question 7* | 0,0001 | 0,74 | 0,0314 | 0,43 |
| *Question 8* | 0,0079 | 0,54 | 0,9212 | 0,02 |
| *Question 9* | 0,0003 | 0,86 | 0,1766 | 0,30 |
| *Question 10* | 0,1749 | -0,32 | 0,0000 | -1,02 |
| *Question 11* | 0,0241 | 0,58 | 0,0915 | 0,52 |
| *Question 12* | 0,2343 | 0,26 | 0,2976 | -0,26 |
| *Question 13* | 0,0000 | -1,16 | 0,0001 | -0,98 |
| *Question 14* | 0,0082 | -0,56 | 0,0226 | -0,46 |
| *Question 15* | 0,0003 | -0,74 | 0,0010 | -0,65 |
| *Question 16* | 0,0000 | -1 | 0,0004 | -0,87 |

## Appendix 3:

**Table 3.1**

Hypothesis 2: Wilcoxon rank-sum (Mann-Whitney U) test, grouped by control/treatment group (means, mean differences, P-values) → FOR ENTIRE SAMPLE

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means | Control group: means | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 0,74 | 0,43 | 0,33 | 0,3288 |
| *Q8* | 0,54 | 0,02 | 0,52 | 0,1853 |
| *Q9* | 0,86 | 0,30 | 0,56 | 0,1166 |
| *Q10* | -0,32 | -1,02 | -0,70 | 0,0173 |
| *Q11* | 0,58 | 0,52 | 0,06 | 0,9583 |
| *Q12* | 0,26 | -0,26 | 0,52 | 0,1405 |
| *Q13* | -1,16 | -0,98 | -0,18 | 0,6342 |
| *Q14* | -0,56 | -0,46 | -0,10 | 0,5995 |
| *Q15* | -0,74 | -0,65 | -0,09 | 0,6161 |
| *Q16* | -1 | -0,87 | -0,13 | 0,8127 |

**Table 3.2**

Hypothesis 2: Wilcoxon rank-sum (Mann-Whitney U) test, grouped by control/treatment group (means, mean differences, P-values) → FOR MALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means males | Control group: means males | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 1,11 | -0,07 | 1,18 | 0,0222 |
| *Q8* | 0,63 | -0,33 | 0,96 | 0,1373 |
| *Q9* | 1,32 | 0,13 | 1,19 | 0,0389 |
| *Q10* | 0,11 | -1,6 | 1,71 | 0,0012 |
| *Q11* | 0,37 | -0,13 | 0,50 | 0,4933 |
| *Q12* | 0,47 | -0,27 | 0,74 | 0,2115 |
| *Q13* | -0,89 | -0,87 | 0,02 | 0,9012 |
| *Q14* | -0,42 | -0,47 | 0,05 | 0,8993 |
| *Q15* | -1,32 | -0,53 | 0,79 | 0,0993 |
| *Q16* | -1,10 | -0,53 | 0,57 | 0,2280 |

**Table 3.3**

Hypothesis 2: Wilcoxon rank-sum (Mann-Whitney U) test, grouped by control/treatment group (means, mean differences, P-values) → FOR FEMALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means females | Control group: means females | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 0,52 | 0,68 | -0,16 | 0,4986 |
| *Q8* | 0,48 | 0,19 | 0,28 | 0,5713 |
| *Q9* | 0,58 | 0,39 | 0,19 | 0,8169 |
| *Q10* | -0,58 | -0,74 | 0,16 | 0,7086 |
| *Q11* | 0,71 | 0,84 | -0,13 | 0,8795 |
| *Q12* | 0,13 | -0,26 | 0,39 | 0,3302 |
| *Q13* | -1,32 | -1,03 | -0,29 | 0,4442 |
| *Q14* | -0,65 | -0,45 | -0,19 | 0,4157 |
| *Q15* | -0,39 | -0,71 | 0,32 | 0,5142 |
| *Q16* | -0,94 | -1,03 | 0,09 | 0,6245 |

**Table 3.4**

Hypothesis 2: Two sample t-test (2-sided), grouped by control/treatment group (P-values, means) → FOR ENTIRE SAMPLE

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means | Control group: means | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 0,74 | 0,43 | 0,33 | 0,2383 |
| *Q8* | 0,54 | 0,02 | 0,52 | 0,0710 |
| *Q9* | 0,86 | 0,30 | 0,56 | 0,0678 |
| *Q10* | -0,32 | -1,02 | -0,70 | 0,0153 |
| *Q11* | 0,58 | 0,52 | 0,06 | 0,8818 |
| *Q12* | 0,26 | -0,26 | 0,52 | 0,1362 |
| *Q13* | -1,16 | -0,98 | -0,18 | 0,5690 |
| *Q14* | -0,56 | -0,46 | -0,10 | 0,7020 |
| *Q15* | -0,74 | -0,65 | -0,09 | 0,7327 |
| *Q16* | -1 | -0,87 | -0,13 | 0,6571 |

**Table 3.5**

Hypothesis 2: Two sample t-test (2-sided), grouped by control/treatment group (means, mean difference, P-values) → FOR MALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means | Control group: means | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 1,11 | -0,07 | 1,18 | 0,0158 |
| *Q8* | 0,63 | -0,33 | 0,96 | 0,0457 |
| *Q9* | 1,32 | 0,13 | 1,19 | 0,0291 |
| *Q10* | 0,11 | -1,6 | 1,71 | 0,0008 |
| *Q11* | 0,37 | -0,13 | 0,50 | 0,4832 |
| *Q12* | 0,47 | -0,27 | 0,74 | 0,2334 |
| *Q13* | -0,89 | -0,87 | 0,02 | 0,9635 |
| *Q14* | -0,42 | -0,47 | 0,05 | 0,9286 |
| *Q15* | -1,32 | -0,53 | 0,79 | 0,0903 |
| *Q16* | -1,10 | -0,53 | 0,57 | 0,2258 |

**Table 3.6**

Hypothesis 2: : Two sample t-test (2-sided), grouped by control/treatment group (means, mean difference, P-values) → FOR FEMALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Treatment group: means | Control group: means | Mean difference TG-CG | P-values |
|---|---|---|---|---|
| *Q7* | 0,52 | 0,68 | -0,16 | 0,5902 |
| *Q8* | 0,48 | 0,19 | 0,28 | 0,4233 |
| *Q9* | 0,58 | 0,39 | 0,19 | 0,5994 |
| *Q10* | -0,58 | -0,74 | 0,16 | 0,6430 |
| *Q11* | 0,71 | 0,84 | -0,13 | 0,7810 |
| *Q12* | 0,13 | -0,26 | 0,39 | 0,3681 |
| *Q13* | -1,32 | -1,03 | -0,29 | 0,4329 |
| *Q14* | -0,65 | -0,45 | -0,19 | 0,5466 |
| *Q15* | -0,39 | -0,71 | 0,32 | 0,2867 |
| *Q16* | -0,94 | -1,03 | 0,09 | 0,7988 |

**Table 3.7**

Hypothesis 2: Fisher exact test (1-sided)*, grouped by control/treatment group AND by responses** (above zero/ below zero) → FOR ENTIRE SAMPLE

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Number of observations | Treatment group: means | Control group: means | P-values | OUTCOME |
|---|---|---|---|---|---|
| *Q7* | 66 | 0,74 | 0,43 | 0,083 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q8* | 56 | 0,54 | 0,02 | 0,174 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q9* | 73 | 0,86 | 0,30 | 0,134 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q10* | 59 | -0,32 | -1,02 | 0,044 | **TG MORE ABOVE ZERO RESPONSES** |
| *Q11* | 71 | 0,58 | 0,52 | 0,533 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q12* | 75 | 0,26 | -0,26 | 0,095 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q13* | 66 | -1,16 | -0,98 | 0,421 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q14* | 53 | -0,56 | -0,46 | 0,438 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q15* | 63 | -0,74 | -0,65 | 0,617 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q16* | 67 | -1 | -0,87 | 0,354 | **TG/CG EQUAL DISTRIBUTION OF +/-** |

*= $H_0$ hypothesis is that distribution of below zero responses and above zero responses in control and treatment group is equal.
**= only responses above/below zero are counted

**Table 3.8**

Hypothesis 2: Fisher exact test (1-sided)*, grouped by control/treatment group AND by responses** (above zero/ below zero) → FOR MALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Number of observations | Treatment group: means | Control group: means | P-values | OUTCOME |
|---|---|---|---|---|---|
| *Q7* | 27 | 1,11 | -0,07 | 0,016 | **TG MORE ABOVE ZERO RESPONSES** |
| *Q8* | 20 | 0,63 | -0,33 | 0,175 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q9* | 31 | 1,32 | 0,13 | 0,084 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q10* | 22 | 0,11 | -1,6 | 0,002 | **TG MORE ABOVE ZERO RESPONSES** |
| *Q11* | 28 | 0,37 | -0,13 | 0,500 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q12* | 28 | 0,47 | -0,27 | 0,391 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q13* | 25 | -0,89 | -0,87 | 0,363 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q14* | 20 | -0,42 | -0,47 | 0,612 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q15* | 22 | -1,32 | -0,53 | 0,705 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q16* | 21 | -1,10 | -0,53 | 0,189 | **TG/CG EQUAL DISTRIBUTION OF +/-** |

*= $H_0$ hypothesis is that distribution of below zero responses and above zero responses between males in control and treatment group is equal.
**= only responses above/below zero are counted

**Table 3.9**

Hypothesis 2: Fisher exact test (1-sided)*, grouped by control/treatment group AND by responses** (above zero/ below zero) → FOR FEMALES

Green = insignificant at a 5% level  Red = significant at a 5% level

| | Number of observations | Treatment group: means | Control group: means | P-values | OUTCOME |
|---|---|---|---|---|---|
| *Q7* | 39 | 0,52 | 0,68 | 0,650 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q8* | 36 | 0,48 | 0,19 | 0,454 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q9* | 42 | 0,58 | 0,39 | 0,521 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q10* | 37 | -0,58 | -0,74 | 0,612 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q11* | 43 | 0,71 | 0,84 | 0,608 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q12* | 47 | 0,13 | -0,26 | 0,155 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q13* | 41 | -1,32 | -1,03 | 0,645 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q14* | 33 | -0,65 | -0,45 | 0,307 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q15* | 41 | -0,39 | -0,71 | 0,538 | **TG/CG EQUAL DISTRIBUTION OF +/-** |
| *Q16* | 46 | -0,94 | -1,03 | 0,589 | **TG/CG EQUAL DISTRIBUTION OF +/-** |

*= $H_0$ hypothesis is that distribution of below zero responses and above zero responses between females in control and treatment group is equal.
**= only responses above/below zero are counted