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OVERCONFIDENCE & CAREER DEVELOPMENT
EVIDENCE FROM AN ONLINE EXPERIMENT

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Abstract

This paper studies the influence of work-experience and professionalism on general overconfidence. An online experiment has been conducted to compare the level of overconfidence between 5 different subject groups of a total sample of 270 individuals from 35 different countries. Socioeconomic control variables have been used to better clarify the unique influence of experience on the overconfidence level. The findings of this quantitative study suggest that even high levels of work experience do not significantly reduce overconfidence. This generates some major implications and tasks for businesses and organizations to be able to reduce the most damaging of existing heuristics.

Keywords: Overconfidence, Work-Experience, Professionalism, Miscalibration

Introduction

Self-confidence is a crucial tool to be successful at the job, in sports or in life in general. It helps to be perceived by others as competent, attractive and successful. Individuals in high positions at the job or in politics would probably not be in such a position if they had a lack of confidence in their own abilities. People may not vote for a politician who appears not confident and thus, unsecure. However, behavioral economists and psychologists show that overconfidence is far more common than underconfidence, a natural human bias that leads to overestimations of one's own abilities (De Bondt & Thaler, 1995). Overconfidence has been blamed as most damaging heuristic, leading to speculative bubbles, decision failures, bankruptcies and even wars (Johnson & Fowler, 2011). The role of work experience and its influence on overconfidence in the financial world has been heavily discussed (Korniotis & Kumar, 2011; Menkhoff et al., 2013; Deaves et al., 2010). This paper aims on finding a broader view by examining the influence of work-experience on general overconfidence, which is explicitly not connected with task-related experiences. Does increasing work-experience lead to lower levels of overconfidence in terms of a better self-estimation or are people that are more advanced in their career automatically in an even higher extent overconfident, also in job-unrelated tasks? Besides this question, it will be studied if higher levels of confidence lead to better decision making or not. Thus, eventually positive effects of confidence can be quantified.

This thesis is structured as follows. Firstly, some theoretical framework will be covered. Overconfidence will be defined, considering state-of-the-art research. The role of overconfidence in businesses and organization will be illuminated, as well as factors with influencing power on that heuristic with a focus on the role of work-experience. In the following, the experimental procedure will be explained in detail, before illustrating the results. Calibration curves, as well as

correlation and regression analysis serve as statistical tools. Based on these results, major findings will be discussed, experimental limitations will be pointed out and an outlook for possible future research will be provided.

Theoretical Framework & Literature Review

Overconfidence – Definition & General Overview

Especially in the Western world, confidence in general is seen as a helpful trait. Confident people are admired, treated with respect and often appear to be more successful. A lack of confidence on the other side is mostly seen as throughout negative and disadvantageous. Kahneman & Tversky (1982) define confidence as subjective probability about the belief that a certain action may occur. Too much confidence, so called overconfidence, has been seen as negative and the threshold to "healthy" confidence can often not be clearly defined. Furthermore, an excess of confidence within the behavior of individuals often has side effects or implies other negative traits, such as arrogance and dishonesty (Kahneman, 2011). Overconfidence can occur in different forms. A very common form is the better-than-average effect, where people estimate their own abilities better than those of the average population (Alicke & Govorun, 2005). Another common form states the planning fallacy, in which people underestimate the time they need to fulfill a certain task (Buehler et al., 1994) or the control illusion as people ignore control deficits to avoid negative feelings (Langer, 1975). They are "blind of their own blindness" (Kahneman, 2011). The definition may appear very broad, the existence of that heuristic is not. According to De Bondt & Thaler (1995), the existence of overconfidence is within individuals the most robust finding of psychologies of judgment. Overconfidence is in literature often measured via general knowledge test questions where it can be calculated by subtracting the proportion of correct answers (the

accuracy) from the average confidence (Cesarini et al., 2009). This method has also been used in this study.

Overconfidence in Business & Organizations

Overconfidence has been blamed in literature for the failure of business decisions or even of organizations as a whole. It is described as most damaging of all heuristics, leading potentially to stock market bubbles or even wars (Johnson & Fowler, 2011). Typically, entrepreneurs overestimate the chances of having success with their business strategy and fail (Moore & Healy, 2008). Venture Capitalists on the other side are getting too enthusiastic about a certain business and loose huge amounts of money (Zacharakis & Shepherd, 2001). Overconfidence leads to the introduction of high risk but unprofitable products (Simon & Houghton, 2003). As overconfidence is perceived to be a very common human bias (Ebering, 2005) it is very likely reaching every part of the society in a higher or lower extent. Thus, also every level within big organizations or companies is affected from this natural human bias. Confidence is a crucial trait for managers or leaders. It increases motivation of leaders to be successful and the ability of removing obstacles (Luthans & Avolio, 2003) while enhancing the followers' commitment to achieve targets (Luthans & Peterson, 2002). Leaders that are confident set more likely higher expectations, higher goals and are more open-minded to welcome new challenges (Luthans et al., 2001). Underconfident leaders on the other side may be perceived as incompetent and lose authority when facing their subordinates. As confident decision makers are having a higher attitude towards risk-taking, organizational growth can be achieved (Black & Porter, 2000). In the case of overconfidence, the risk can reach an irresponsibly high dimension that leads to problems and ignorance of errors (Dorner & Schaub, 1994). Shipman & Mumford (2011) state that overconfidence within leaders leads to several serious failures, as overestimated expectations and less effective strategies.

Furthermore, CEO overconfidence leads to irresponsibly higher leverage in company's capital structures and is, as consequence, reason for several bankruptcies (Antoncyk & Salzmann, 2014).

Influencing factors on Overconfidence – The Role of Experience

A wide range of factors are perceived to have the power of increasing or decreasing overconfidence within individuals. However, literature often provides contradictory results. Menkhoff et al. (2013) were conducting a study with financial markets traders, finding out that trade experience is reducing overconfidence. Korniotis & Kumar (2011) support that hypothesis, but point out that age surprisingly increases overconfidence in trading. Other studies brought opposite results (Deaves et al., 2010). Chen at al., (2007) state that experience within investors does not have the power to always decrease overconfidence. However, it can be stated that overconfidence and financial risk-taking are strongly connected, excessive trading and stock market bubbles are blamed to be the result of that heuristic (Scheinkman & Xiong, 2003). That even experienced traders still fail quite often may give support for the assumption that experience and familiarity with tasks increases overconfidence. Hansson et al. (2008) point out that overconfidence can be rapidly reduced via additional task experience, in the case of measuring overconfidence with probability judgments. Measuring overconfidence with intuitive confidence intervals on the other side could only be minimally reduced by excessive task experience. Thus, the way of measuring the level of overconfidence in experiments plays a big role and influences the results heavily (Klayman et al., 1999). However, experience has been throughout different research methods one of the main factors influencing overconfidence. Especially in the field of finance, extensive studies tried to find out general relationships of overconfidence with experience, without a clear answer. This paper aims to guide the focus away from the influence of experience only on overconfident trading and investment practices towards a more general level, raising the

question if work-experience, independently from a specific area, is able to reduce general overconfidence or not. Thus, the following hypothesis will be tested.

Hypothesis 1: A higher level of work-experience/professionalism is reducing general (over)-confidence

Socioeconomic control variables, such as gender differences, are used in the experiment to be more able to determine the unique influence of work experience. The area in which people are working has not been taken into account on purpose to bring results on a general, overall valid level.

Confidence is often described as helpful trait for success and performance. Some researchers even state that overconfidence can be positive and leads to higher personal success as it is able to increase morals and ambitions, as well as credibility (Johnson & Fowler, 2011). Thus, it will also be tested if higher confidence levels will lead to a better quality of decisions, a higher proportion of correct answers in this specific experiment. Therefore, the following hypothesis will be tested as well:

Hypothesis 2: Higher confidence levels lead to better decision making and more correct answers.

Experimental Design

Quantitative research has been conducted via a behavioral online experiment to test the hypotheses. For this purpose, a set of 15 general knowledge questions with two possible answers has been used. After each question, the participant has to state his individual level of confidence of having chosen the correct answer. This methodology states a typical approach to measure overconfidence within individuals, used in a wide range of studies, for instance from Griffin &

Tversky (1992).

I collected a sample with subjects that have different levels of work-experience to test the influence of that factor on general overconfidence. The online experiment has been conducted by people from different countries, with a different age structure and different levels of education. I mainly used my own personal network to distribute the questionnaire. For that reason, answers are mainly concentrated on subjects with German or Portuguese nationality. I mainly used social media, especially Facebook, as distribution channel to achieve a high number of participants quickly. The data has been collected within November and December 2016. Participants with different levels of work experience could been reached which has been a crucial contribution for the overall findings of the research purpose. The survey was build up on the online survey platform Qualtrics and set up completely in English. I used this online method to be able to gather more data and to get answers from different countries in a convenient time. The general knowledge questionnaire consists of questions from different areas, such as sports, history, geography, science and biology. Thus, I tried to avoid that subjects which possibly work in a certain area will have advantages and achieve "better" results in terms of a better self-estimation. Hansson et al. (2008) point out that task related experience has a significant influence on the level of confidence/overconfidence. Therefore, the mentioned bias could be avoided without the need of asking participants about their profession.

Within the questionnaire, the participants always had to choose between two alternatives and in the following state their level of confidence. The scale of confidence levels ranged from 50% to 100%, as there were only two possible answers for each question. A chosen confidence level of 100% means that the participant is completely sure about his answer whereas a chosen confidence level of 50% implies that the participant completely guessed his answer. Thus, by

guessing the answer, the subject is statistically in 50% of the cases right, which explains the range of the scale. A chosen confidence level of 60% indicates that the participant thinks that the chance of having chosen the correct answer between the 2 possibilities is with a chance of 6/10 correct. To avoid confusion, the procedure has been explained to all participants. Furthermore, the survey program forced participants to only be able to choose one possible level of confidence which is the closest to their subjective self-estimation. The general knowledge questions were designed as partly very tricky to stimulate overconfidence within the participants and therefore make as consequence differences between the subject groups more clear. Some questions may be perceived as more difficult for certain participants than for others, regarding their different educational background or their general interests, as well as their different areas of work experience. However, the proportion of correct answers was anyway only used to calculate the level of overconfidence, not to determine the general knowledge of people. I calculated for each participant his individual level of overconfidence by subtracting the average level of confidence from the proportion of correct answers. Thus, the bias score of each participant could be determined. Nevertheless, as research shows that more difficult tasks are more likely subject to overconfidence than easy tasks (Griffin & Tversky, 1992) that may even be subject to under-confidence, I tried to find questions that were not straight forward and not easy to answer to avoid possible underconfidence. The questions were designed by myself, adapted from experiments with similar structures, except of one question (Q14, cf. appendix) which has been adopted due to its, in my opinion, high quality (Atanasov, 2012; Arkes et al., 1987).

The questionnaire consists of 2 parts. After providing some personal details that are later used to test the influence of socioeconomic control variables, the 15 questions as explained above

were presented. There was no time limit to answer the questions. In the following you find two exemplary questions that were asked in the survey:

1. How many countries were founding members of the OECD?

A) 10   B) **20**

Confidence: 50%   60%   70%   80%   90%   100%

2. Which country has the higher absolute GDP?

A) Russia   B) **Japan**

Confidence: 50%   60%   70%   80%   90%   100%

All 15 questions are listed in Appendix A. In the examples above, the correct answers have been marked bold. For instance, the first question aimed to generate associations within people to connect the amount of founding members automatically with the lower number and thus, create extensive overconfidence. As Russia is by far larger than Japan, the purpose was to guide people towards the wrong answer, thinking that Russia has due to its bigger size also a higher GDP.

Method

Descriptive Statistics

A total amount of 270 subjects were participating in this online experiment, of which 53.3% were female and 46.7% were male. Participants had an average age of 30.47 years, ranging from 19 to 78 years ($\sigma = 11.8\ years$). People from 35 different countries on all continents participated in the experiment. However, the biggest part had the German (65.6%) or Portuguese (11.1%) nationality. The data has been analyzed with IBM SPSS Statistics 23. To create the calibration curves Microsoft Excel 2013 has been used. The participants have been divided into five different

subject groups regarding their level of work experience: No work experience, less than 3 years, 3 to 7 years, 8 to 15 years, and more than 15 years.

Variables

To test the first hypothesis, <u>Work Experience</u> states the independent variable testing the influence on general <u>(Over)-Confidence</u> that is indicating the dependent variable. In the second hypothesis, the variable <u>Confidence</u> is the independent variable for the dependent variable <u>Accuracy</u> (the proportion of correct answers). Participants were further asked to provide information regarding their <u>Gender</u>, <u>Age</u>, their <u>Highest Achieved Degree </u>and their <u>Nationality</u>. These factors were used as control variables to test possible impacts on the level of overconfidence and accuracy and furthermore, to better see the unique influence of work-experience. For instance, a higher achieved degree may also influence the level of self-estimation (Bhandari & Deaves, 2006). People with a PhD degree may be more confident in their own knowledge or, on the other way around, be able to estimate more accurately their knowledge level. Cross-cultural differences have a huge impact on the level of overconfidence in the area of finance (Antonczyk & Salzmann, 2014) and also on general overconfidence (Burns & Luo, 2006) where significant differences exist for instance between the western culture and the East-Asian culture (Yates et al., 1998). Furthermore, gender and age may influence overconfidence in both directions, as research shows (Bruine de Bruin et al., 2012; Bengtsson et al., 2005; Pliske & Mutter, 1996).

Results

Calibration Curves

Via so called calibration curves, an aggregated overview of the different levels of calibration/miscalibration of each subject group could be build up. This approach states a typical

method used in overconfidence-experiments (Griffin & Tversky, 1992). The curves show a graphical comparison between the different subject groups that are clustered regarding every individual's level of work-experience. However, as the graphs are not sufficient to confirm or reject the hypotheses, further statistical analysis had to be conducted. Every graph compares each group's level of confidence (horizontal axis) with its accuracy, the proportion of correct answers (vertical axis), at the specific confidence level that has been indicated in the online survey. For instance, the yellow line at the 60% confidence level (x-Axis) shows the average accuracy (y-Axis) for all the individuals within the subject group (3 to 7 years of work experience) that were indicating a level of 60% confidence on a certain question. The red line indicates the perfect calibration line. If an individual or a group is located on this line, it is perfectly calibrated. For instance, if subject group A had in average 60% of their answers correct whenever individuals within the group indicated their level of confidence as 60%, the group were perfectly calibrated. Thus, they had a perfect level of self-estimation. Consequently, if a group lies in certain confidence levels below the perfect calibration line, it is overconfident. The higher the difference between the group's calibration curve and the perfect calibration line, the higher the level of overconfidence. On the other hand, a group's calibration curve that lies above the perfect calibration line indicates that this specific group is underconfident. Thus, the individuals within this hypothetical group underestimate in average the probability of having chosen the correct answer. The following figure shows the calibration curves for the different subject groups of the experiment.

Figure 1. CALIBRATION CURVES OF THE SUBJECT GROUPS
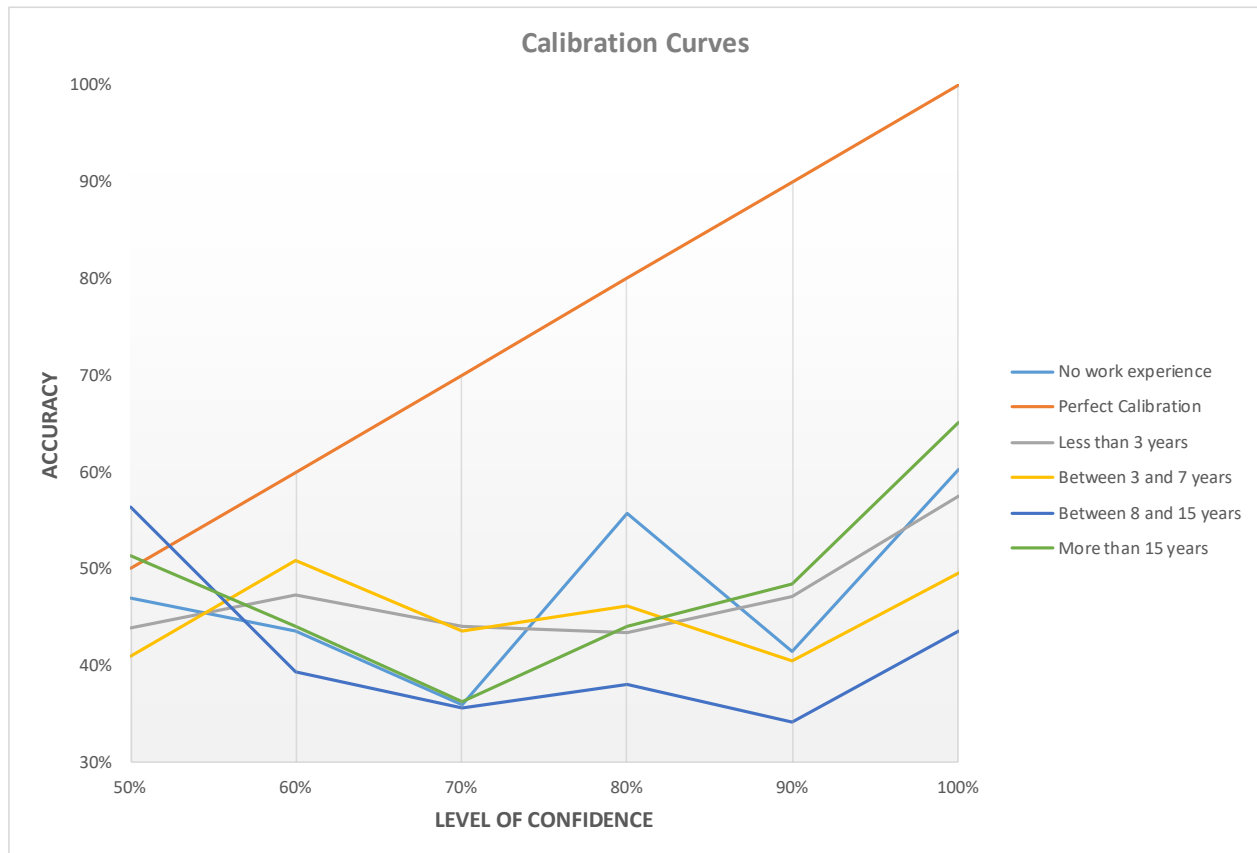
The calibration curves in Figure 1 above clearly show that all different subject groups are consequently overconfident along all indicated levels of confidence, except on the 50% confidence level where the "between-8-and-15-years-experience" group and the "more-than-15 years-experience" group were slightly underconfident. This could give first hints to support the hypothesis that work-experience has the power to reduce general overconfidence. The outcome of the calibration curves makes it difficult to determine a clear ranking of overconfidence within the different subject groups. The "more-than-15-years-experience" group had the most accurate self-estimation in the 90% or 100% confidence level area, which could give hints for supporting the first hypothesis. However, in the 70% confidence level region, the "more-than-15-years-experience group" had one of the worst calibrated values. Taking out the "more-than-15-years-experience

group" from the 90% and 100% confidence level area would create a clear ranking of increasing miscalibration with higher levels of work experience. It can also be seen that the bias score is in average the highest at the 80% and 90% indicated confidence levels. The following table shows the average values for each subject group:

Table 1. AVERAGE BIAS SCORE FOR THE SUBJECT GROUPS

Work Experience	Bias Score
None	26%
Less than 3 years	25%
3 to 7 years	27%
8 to 15 years	29%
More than 15 years	25%

Table 1 indicates that the "more-than-15-years-experience" group and the "less-than-3-years-experience" group have on average the most accurate calibration. The worst calibration has the 8-to-15-years-experience group. However, as a clear hierarchy cannot be determined so far, further statistical analysis has been conducted.

Correlation

As the independent variable work experience is an ordinal scaled variable I used the Spearman-Rho Correlation instead of the Pearson-Product-Moment Correlation to determine the correlations (cf. Table 2). It shows that work experience is only weakly correlated with both, the confidence and the overconfidence variable, giving further reasons to reject the first hypothesis. It seems that even high levels of work-experience and career development are not able to reduce this damaging heuristic. However, the correlation table brought out other interesting findings. The variable gender therefore has a significant impact on the proportion of correct answers, the accuracy, and also on the level of confidence. Women had significantly (Sig. = 0.001) more

answers wrong and lower levels of confidence (Sig. = 0.000). The level of overconfidence on the other side does not change significantly with gender. Furthermore, confidence is significantly positive correlated with the accuracy variable, confirming the second hypothesis that high confidence leads to better decision making and therefore to higher level of success and specifically to more correct answers in my experiment.

Table 2. CORRELATION

		Gender	Level of Work Experience	Highest Achieved Degree	Age	Accuracy	Overconfidence	Confidence
Gender	Correlation coefficient	1,000	-,029	,115	-,084	-,199**	,060	-,255**
	Sig. (2-tailed)		,641	,060	,168	,001	,329	,000
	N	270	270	270	270	270	270	270
Level of Work Experience	Correlation coefficient	-,029	1,000	,114	,703**	-,021	,051	,041
	Sig. (2-tailed)	,641		,062	,000	,731	,404	,504
	N	270	270	270	270	270	270	270
Highest Achieved Degree	Correlation coefficient	,115	,114	1,000	,292**	,047	-,071	-,051
	Sig. (2-tailed)	,060	,062		,000	,445	,245	,404
	N	270	270	270	270	270	270	270
Age	Correlation coefficient	-,084	,703**	,292**	1,000	,048	-,015	,076
	Sig. (2-tailed)	,168	,000	,000		,434	,802	,213
	N	270	270	270	270	270	270	270
Accuracy	Correlation coefficient	-,199**	-,021	,047	,048	1,000	-,824**	,158**
	Sig. (2-tailed)	,001	,731	,445	,434		,000	,009
	N	270	270	270	270	270	270	270
Overconfidence	Correlation coefficient	,060	,051	-,071	-,015	-,824**	1,000	,366**
	Sig. (2-tailed)	,329	,404	,245	,802	,000		,000
	N	270	270	270	270	270	270	270
Confidence	Correlation coefficient	-,255**	,041	-,051	,076	,158**	,366**	1,000
	Sig. (2-tailed)	,000	,504	,404	,213	,009	,000	
	N	270	270	270	270	270	270	270

** highly significant on the 0.01 level (2-tailed)

Regression Analysis

To specify the influence of the independent variables on the dependent variables regression analysis has been used. The first regression tested the impact of work experience on general confidence. For statistical reasons I used confidence instead of overconfidence as dependent variable. The second regression measures the impact of the levels of confidence on the accuracy variable. I used hierarchical multiple regressions to be able to test the influence of socioeconomic

control variables before introducing the "main" independent variable. Thus, the influence of this variable can be more clearly determined and observed on a "stand-alone-basis". To avoid multicollinearity, the independent control variable age has not been used for the regression, as it is highly correlated with work experience and thus, would not bring any additional value to the statistical analysis. Furthermore, the control variable nationality has not been used as well. Taking a deeper look into the descriptive statistics shows that the number of participants is highly concentrated in Germany and Portugal. To be able to focus on cross-cultural differences a higher number of participants with different cultural backgrounds would have been needed. To run the regressions in SPSS, I recoded the control variables via dummy variables as they are all used as categorical variables. This leads also to a better understanding of the influence of each sub-variable.

Work Experience on Confidence Regression

The first regression introduces the main independent variable work experience (Model 2) after having introduced the control variables (Model 1). The results from Model 2 clearly show that a higher level of work experience is not able to reduce confidence. The only variable with a significant influence is the female dummy variable which has a highly significant (Sig. = 0.000) negative influence (Beta = -0.234) on the level of confidence. Work experience does not contribute to the explanation of the model. Thus, the first hypothesis has to be rejected. As I used dummy variables for each subject group it can furthermore be stated that none of the subject groups with different experience levels is significantly influencing the level of confidence. The R-square change after introducing the work-experience variable is very small (1.6%) and insignificant (Sig. > 0.05).

Table 3. MULTIPLE HIERARCHICAL REGRESSION – WORK EXPERIENCE ON CONFIDENCE

Model		Not standardized coefficient	Standardized Coefficient	Sig.
		Regression Coefficient B	Beta	
1	(Constant)	,739		,000
	FEMALE	-,044	-,234	,000
	Highschool or less	,019	,079	,219
	Master/Diploma	,002	,009	,892
	Doctor/PhD	,000	,000	,996
2	(Constant)	,738		,000
	FEMALE	-,044	-,233	,000
	Highschool or less	,019	,078	,258
	Master/Diploma	-,002	-,011	,869
	Doctor/PhD	-,009	-,016	,808
	No Experience	,015	,047	,457
	Between 3 and 7 Y experience	,002	,008	,908
	Between 8 and 15 Y experience	-,029	-,083	,200
	More than 15 Y experience	,021	,082	,236

Table 4. MODEL SUMMARY – WORK EXPERIENCE ON CONFIDENCE REGRESSION

Model	R-Square	Change in R-Square	Sig. Change in F
1	,063	,063	,002
2	,079	,016	,326

Confidence on Accuracy Regression

Running this regression, it can be again observed that the socioeconomic control variables have already a significant impact, this time on the dependent variable accuracy. This effect comes mainly from gender differences. The female dummy variable has a statistically significant (Sig. =

0.001) negative influence (Beta = -0.196) on the accuracy. Adding the "main" independent variable to the model, in this case the level of confidence, makes the model further significant (Sig. = 0.006). All results can be observed in the table below. We can confirm the second hypothesis, emphasizing that higher levels of confidence contribute significantly to a better accuracy and thus lead to better decision making.

Table 5. MULTIPLE HIERARCHICAL REGRESSION – CONFIDENCE ON ACCURACY

Model		Not standardized coefficient	Standardized coefficient	Sig.
		Regression Coefficient B	Beta	
1	(Constant)	,501		,000
	FEMALE	-,059	-,196	,001
	Highschool or less	-,027	-,070	,312
	Master/Diploma	-,015	-,048	,493
	Doctor/PhD	,098	,104	,105
	No Experience	,016	,032	,615
	Between 3 and 7 Y experience	-,007	-,018	,784
	Between 8 and 15 Y experience	-,053	-,094	,145
	More than 15 Y experience	,020	,049	,483
2	(Constant)	,300		,000
	FEMALE	-,047	-,156	,012
	Highschool or less	-,032	-,084	,224
	Master/Diploma	-,014	-,046	,505
	Doctor/PhD	,100	,107	,093
	No Experience	,012	,024	,703
	Between 3 and 7 Y experience	-,007	-,019	,766
	Between 8 and 15 Y experience	-,045	-,080	,211
	More than 15 Y experience	,014	,035	,614
	CONFIDENCE	,272	,172	,006

Table 6. MODEL SUMMARY – CONFIDENCE ON ACCURACY REGRESSION

Model	R-Square	Change in R-Square	Sig. Change in F
1	,071	,071	,012
2	,098	,027	,006

General Discussion

Implications

This paper sets a highlight on overconfidence in general without setting a focus on a specific part of societies. Unlike overconfidence in investments and financial decision making, the overall effect of work experience on general overconfidence did not receive that much attention. Contradictory to experimental results in the financial area where experience has the power to decrease or increase overconfidence, this study suggests that general overconfidence cannot be reduced by increasing work experience. Once again, this shows how robust this heuristic is and how hard it is to reduce. Thus, how difficult it is to minimize its damaging effects in societies and businesses. But it also sets the clear incentive to decision makers and organizations to find ways to overcome this damaging heuristic. Integrating workshops in the leadership education to improve self-estimation and reduce overconfidence could illustrate first measures to manage and reduce this heuristic. However, this exceeds the scope of this research and could be subject for further investigation. Calibration curves, correlation and regression analysis were not able to define clear differences of overconfidence between the different subject groups that were clustered regarding work experience. It was interesting to see that significant gender differences exist, in terms of women having less confidence and less correct answers. The lower accuracy of women could be explained by gender specific questions that may be part of the questionnaire and which could also have affected the indicated confidence level. For instance, 75% of males, but only 67% of females knew the correct answer to the question which team won more titles in the first Spanish football division. As consequence, the mentioned gender differences must be interpreted cautiously. Research often points out higher levels of overconfidence of men (Bengtsson et al., 2005). This paper could not confirm this assumption. Furthermore, the study points out that higher levels of

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confidence correlate strongly with better decision making. This suggests that high levels of confidence are important to reach better results not only in knowledge tests but potentially also in tasks of the daily life.

Limitations and Outlook

There are some further limitations that must be addressed concerning this study. As the experiment has been conducted online by the participants, it was not possible to observe how each individual filled out the questionnaire. Participants may have used sources of help like the internet, others may have filled it out in a group and not individually, others may have filled out the questionnaire completely randomly. Furthermore, the circumstances and the environment of the experiment could also have affected the results. Participants with a tight time schedule may have answered differently than people that did a high level of due diligence for every answer. Drug abuse also has the potential to change levels of overconfidence. Research shows that drugs like cocaine and alcohol increase the level of overconfidence (Russo & Schoemaker, 1992). The time of the day or the mood of each individual in terms of emotions that were existing in the time the subject filled out the survey could state further influences that could not been controlled. However, as I used mainly my own personal network and asked people I know and trust, negative violations due to a big part of the mentioned problems can be assumed to be very small. Nevertheless, the use of the own network also bears risks of further influence. The major part of people I addressed the questionnaire to, were friends of mine. It can be assumed that these friends have certain things in common as they are somehow connected to me. This fact could also push the overall results in a certain, unknown direction. Furthermore, as the experiment was completely conducted in English, some participants with minor English knowledge may have misunderstood certain aspects. As the biggest part of answers were German speakers, this factor could have indeed a significant aspect.

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Others may have stopped or not even have started the survey due to language problems. Thus, some participants with minor education may be naturally excluded. Answers could have been collected from a wide range of countries. However, due to my extended network in Germany, most of the participants were German. Thus, valuing the results as generally valid in a cross-cultural context may be difficult. I did not take the work field or the field of study into account. Even though I know, due to my personal connection I have in most of the cases, that people who answered this study have a wide range of different backgrounds, a big group of participants were business students. This fact may also have affected overall results to a certain level.

A major goal of this study was to find overall implications of the influence of work experience and professionalism without focusing on a certain area. For that reason, certain influencing variables, as the area of experience, have been ignored on purpose. However, these influencing variables are partly very significant, as examples in the financial area show. Therefore, a focus on specific aspects that have not been deeply researched yet is an important issue to face in the future. This includes also setting a further focus on fields that are not explicitly part of Economics or Psychology. The field of neurophysiology could be crucial to understand more deeply that heuristic from a medical point of view with implications also on economics. A controlled field experiment instead of the conducted online experiment could help to eliminate undesirable influencing factors.

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Appendices

Appendix A

General Knowledge questions of the Online Experiment – Correct answers in bold

1. Which country is larger (in sq. km)?
   A) China   B) **Canada**

Confidence: 50%   60%   70%   80%   90%   100%

2. How many countries are founding members of the OECD?
   A) 10   B) **20**

Confidence: 50%   60%   70%   80%   90%   100%

3. Which country has the higher population?
   A) Peru   B) **South Korea**

Confidence: 50%   60%   70%   80%   90%   100%

4. Which movie won more Oscars?
   A) Forrest Gump   B) **Slumdog Millionaire**

Confidence: 50%   60%   70%   80%   90%   100%

5. Which team won the most titles in the first Spanish football league Primera Division?
   A) **Real Madrid**   B) FC Barcelona

Confidence: 50%   60%   70%   80%   90%   100%

6. What length has the European river Rhine?
   A) **1230 km**   B) 1580 km

Confidence: 50%   60%   70%   80%   90%   100%

7. Which is the MORE widely spoken language in the world?
   A) **Arabic**   B) Portuguese

Confidence: 50%   60%   70%   80%   90%   100%

8. What city has a higher population?
   A) **San Jose**   B) San Francisco

Confidence.   50%   60%   70%   80%   90%   100%

9. Which fruit has a higher proportion of Vitamin C?
   A) Orange   B) **Strawberry**

Confidence.   50%   60%   70%   80%   90%   100%

10. Which country has a higher birth rate?
    A) India   B) **Iraq**

Confidence.   50%   60%   70%   80%   90%   100%

11. Which Religion has a higher proportion within the population in India?
    A) **Christendom**   B) Buddhism

Confidence: 50%   60%   70%   80%   90%   100%

12. Which is the 5th planet from the sun?
    A) **Jupiter**   B) Saturn

Confidence: 50%   60%   70%   80%   90%   100%

13. Which country has the higher absolute GDP?
    A) Russia   B) **Japan**

Confidence: 50%   60%   70%   80%   90%   100%

14. Which company is selling more beer?
    A) **Anheuser-Busch** B) Heineken

Confidence: 50%   60%   70%   80%   90%   100%

15. Which American Newspaper is ranked higher by circulation (2016)
    A) The New York Times B) **USA Today**

Confidence: 50%   60%   70%   80%   90%   100%