

Gender Differences, Risk-Taking and Self-
Monitoring in the Creative Process

Tair Tager-Shafir

Interdisciplinary Studies Unit

Gender Studies Program

Ph.D. Thesis

Submitted to the Senate of Bar-Ilan University

Ramat-Gan, Israel

May 2022

This work was carried out under the supervision of

Prof. Michal Lavidor

Department of Psychology, Bar Ilan University

Acknowledgments

First, I would like to thank my supervisor, Prof. Michal Lavidor for outstanding guidance. Thank you for supporting, encouraging, teaching, and believing in me. I couldn't have asked for a better mentor.

I would also like to thank Itamar Lavidor and Adi Hoorvitch-Lavi for their contribution to this work.

I would like to thank the amazing women, my sisters in the Gender Studies program. To Orit Kandel, thank you for welcoming me with open arms to the program, for supporting me step by step, and for the good advice and friendship. To Dr. Ronit Irshai, Dr. Miri Rozmarin, and Dr. Gilly Hartal for your critical support during the challenging times along the way.

And finally, I want to thank my family. To my dear and beloved partner, for endless support, love, and faith. And to my parents, and especially my mother, for the hard work you put in to give us a better future, for being a role model and inspiration.

Table of Contents

Abstract	I
Introduction	1
Creativity	3
The creative process	5
Gender differences in creativity	6
Entrepreneurship, creativity, and gender	8
Chapter 1: Judgment and gender inequality: the effect of anticipated evaluation on creativity test performance of women and men	11
1.1 Introduction	11
1.1.2 Creativity, judgment, and gender	14
1.1.3 Creativity, gender, and self-monitoring	15
1.1.4 Research overview	16
1.2 Method.....	17
1.2.1 Participants and design.....	17
1.2.2 Measures	18
1.2.3 Procedure.....	19
1.3 Results	19
1.3.1 Self-monitoring	20
1.3.2 Judgment ,creativity ,and gender	20
1.4 Discussion.....	23
1.4.1 Limitations	26
1.4.2 Summary and conclusions.....	26
Chapter 2: Exploring the interactive influence of risk taking and gender on creativity	28
2.1 Introduction	28
2.1.1 Creativity and risk-taking.....	28
2.1.2 Risk-taking and gender	29
2.1.3 Risk-taking ,gender, and creativity	30
2.2 Method.....	32
2.2.1 Participants	32
2.2.2 Measures	32
2.2.3 Procedure.....	34

2.3 results.....	34
2.3.1 Risk taking – manipulation validation	35
2.3.2 Risk-taking ,gender, and AUT creative performance	35
2.3.3 Risk-taking ,gender, and the Creative Foraging Game performance...	36
2.4 Discussion.....	38
2.4.1 Limitations	40
2.4.2 Conclusion.....	40
Chapter 3: When stereotypes do not predict discrimination: An integrated research paradigm for gender bias assessment of entrepreneurs and technological ventures	42
3.1 introduction.....	42
3.1.1 Venture vs entrepreneur evaluation	43
3.1.2 Gender role congruity theory and entrepreneurship.....	45
3.1.3 The stereotype index	46
3.1.4 Evaluator's gender	47
3.1.5 Research overview	48
3.2 Method.....	50
3.2.1 Participants	50
3.2.2 Measures	50
3.2.3 Procedure.....	53
3.3 Results	53
3.3.1 The effect of entrepreneurs’ gender (the experimental manipulation) and participants’ gender on project evaluation	54
3.3.2 Entrepreneurial gender-related characteristics	56
3.3.3 The relationship between stereotypical thinking and gender bias in project evaluation	57
3.4 Discussion.....	58
3.4.1 Limitations	61
3.4.2 Conclusions	62
General discussion.....	64
References.....	69
Appendix 1.....	91
Self-monitoring scale.....	91
Appendix 2	93
risk-taking questionnaire	93
Appendix 3	96
Entrepreneurial traits selection task.....	96

List of Figures

<u>Figure 1</u> . Illustration of the research plan to examine three variables (judgment, risk taking, discrimination) at three time points in the process where a creative idea becomes a product that undergoes evaluation (creation, presentation and evaluation).....	3
<u>Figure 2</u> : Illustration of The Creative Foraging Game.....	19
<u>Figure 3</u> : Mean creativity test scores and standard errors in the fluency index in men and women in the different experimental conditions-- with judgment and without judgment.....	22
<u>Figure 4</u> : Mean creativity test scores and standard errors in the originality index in men and women in the different experimental conditions-- with judgment and without judgment (scores are in reversed scale, higher score=less originality).....	23
<u>Figure 5</u> : Mean creativity test scores and standard errors in the AUT fluency index in men and women in the different experimental conditions-- with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.....	36
<u>Figure 6</u> : Mean creativity test scores and standard errors in the AUT fluency index in men and women in the different experimental conditions-- with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.....	37
<u>Figure 7</u> : Average time taken to create shapes in the CFG in men and women in the different experimental conditions-- with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.....	38
<u>Figure 8</u> : Entrepreneurial characteristics selection.....	57

List of Tables

<u>Table 1</u> : Gender distribution, mean age and self-monitoring scores in the experimental conditions.....	20
<u>Table 2</u> : Post-hoc analyses: Interaction of gender and experimental conditions.....	22
<u>Table 3</u> : Gender distribution and mean age in the experimental conditions.....	35
<u>Table 4</u> : Venture's description.....	52
<u>Table 5</u> : Gender distribution and mean age in the experimental conditions.....	54
<u>Table 6</u> : Means for subject's evaluation of entrepreneurial projects.....	55
<u>Table 7</u> : Means for entrepreneurial projects according to entrepreneur's gender.....	56

Abbreviations

ANOVA	Analysis of Variance
AUT	Alternative Uses Test
CFG	Creative Foraging Game

Abstract

Creativity is a key component in entrepreneurship and innovation, which in turn, contribute to social and economic growth. But while women and men have equal performance on standard creativity tests, women have fewer opportunities and more barriers on their way to fulfill creative and entrepreneurial accomplishments. This inequality is mostly due to sociological and cultural reasons, which, among other things, make women more sensitive than men to judgment and criticism and take fewer risks (Jin, Chua & Bledow, 2017). In addition, women are discriminated against due to gender biases in some organizations, which impair their chances of implementing creative ideas as expressed, for example, in entrepreneurship.

The work presented below describes the findings from three research sets constructed to examine three factors found to be related to gender differences in creativity and entrepreneurship. The first factor we examined was **judgment** and its impact on creative performance. In this study, participants took a test to measure creativity under conditions in which we emphasized that the creative products would be judged and given a score. The main finding in this study showed that women and men were affected differently from our manipulation so that women were not affected at all, and men were positively affected, and their performance was significantly higher. The second factor we examined was **risk-taking**. In this study, we encouraged women and men to take risks and then tested their performance on creativity tests. We found that risk-taking had a positive effect on women's performance and a negative one on men's performance, but the findings were partial and limited. Finally, the third factor we examined was **stereotypical thinking** and bias towards ventures led by women and men. In this study, we found that there is prevalent stereotypical thinking among both men and women, who see the ideal entrepreneur as a male figure. Surprisingly, this stereotypical thinking was not expressed in a bias towards women-led ventures as seen in explicit venture evaluations.

The aim of the research was to contribute to the body of knowledge about gender differences, barriers and biases related to creativity and entrepreneurship and to

examine the effects of judgment processes, risk taking and stereotypical thinking on the creative and entrepreneurial potential of women and men.

Our conclusions are that gender gaps appear in a complex and often unexpected way in the areas of creativity and entrepreneurship. It seems that in some cases gender differences in performance can be easily produced, by changing slightly the test instructions for example, and in other cases the gap can be somewhat "corrected" by encouraging risk-taking. However, different interventions can vary in their impact on men and women, and this should be taken into account when evaluating performances. In a similar way, stereotypical thinking towards women and men, as entrepreneurs, still exists and is expressed in all sorts of ways in the labor market, but it may not be manifested in empirical research. We discuss possible explanations for this gap.

As some of the processes in which gender differences are created and preserved are not entirely clear, we believe that these intersections between gender, creativity and entrepreneurship should be further explored. A better understanding of the relationship between gender, creativity and entrepreneurship could contribute to women being able to realize their creative potential more easily, and to a more egalitarian and just society.

Introduction

In October 2018, German Chancellor Angela Merkel visited Israel. During the visit, she met with the Prime Minister and a number of leading entrepreneurs in the high-tech industry in Israel. The meeting was recorded in an unforgettable picture: Merkel is in the center, surrounded only by men.

This picture is, perhaps, a reflection of an existing reality in Israel. A reality in which women entrepreneurs are few and are not recognized for their achievements and do not get an equal opportunity to meet people in key positions like Merkel. The reasons for this inequality are complex and often depend on the observer's perspective, but it is clear that there is a need for social and cultural change in order to create a reality different from that in the picture. It is also clear that changes must occur in the education system and in the labor market where gender differences and inequality can be seen prominently (Subrahmanian, 2005; Aslam, 2008; Aragonés-González et al., 2020)

Today's labor market includes many aspects of entrepreneurship and innovation, which require creativity (Zhao, 2012). The growing need for entrepreneurial projects, brings along a parallel need for talented and creative people, and one of the ways to nurture, encourage and understand the nature of creative people and their creative expressions is by using creativity tests designed to assess and estimate the creative potential of individuals (Grant & Ashford, 2008; Shalley, Zhou, & Oldham, 2004). These tests are highly used in many fields, including the education system and the labor market (Kanli, 2020). In Israel, for example, there are quite a few organizations that specialize in sorting and evaluating employees for employment purposes, and in all of them, creativity tests are routinely used (Israeli employment service).

Creativity tests are designed to measure creative potential under the assumption that the tests performance can predict creative achievement (Kim, 2008). However, creativity tests do not show any gender difference in *creative potential* (Abraham, 2016; Baer & Kaufman, 2008) while there are major gender differences in *creative performance* (Chavez-Eakle et al., 2006; Dul et al., 2011; Martin-Brufau & Corbalan, 2016) and

creative achievements in many fields that are considered "creative" such as theater ('She knows' gender index, 2020) and Entrepreneurship (Israel Innovation Authority report, 2019).

A number of factors, including the fact that women encounter fewer opportunities and additional barriers on the way to attain creative and entrepreneurial achievements (Baer, 1997, 1998; Jennings & Brush, 2013; Piacentini, 2013), explains this gap. In addition, it is commonly assumed that the gender differences in creative achievements are caused by sociological and cultural reasons, which make women more sensitive to the way their peers and friends evaluate them and seek less risks, compared to men (Jin, Chua & Bledow, 2017) and at the same time being discriminated against by investors and venture capital funds (Guzman & Kacperczyk, 2019; Malmström *et al.*, 2017). Another perspective suggests that gender gaps actually begin already in the creative process in which creative ideas arise and undergo a process of judgment and evaluation (Jin, Chua & Bledow, 2017)..

In the current study, we sought to focus on the gap between creative potential and creative achievements and to examine three variables and their relationship to gender at three time points in the creative process as illustrated in figure number 1. The first time point is the process of creating the creative products, where we examined how the knowledge that at the end of the process comes judgment, affects creative performance. The second time point is the selection of the most successful products or ideas among all those created, where we examined how encouraging the tendency to take risks will affect the selection of the most original products. Finally, the last time point we examined is the evaluation phase, where we examined whether there is gender discrimination at the stage when the creative products are evaluated by judges.

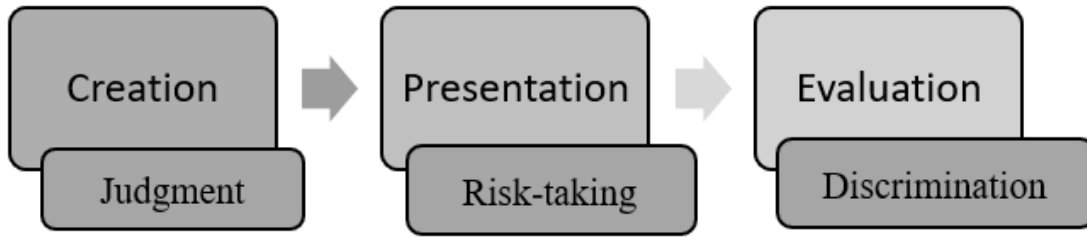


Figure 1. Illustration of the research plan to examine three variables (judgment, risk taking, discrimination) at three time points in the process where a creative idea becomes a product that undergoes evaluation (creation, presentation and evaluation).

Next, we will briefly review the main topics of the dissertation - creativity, entrepreneurship and gender in preparation for the presentation of the empirical studies.

Creativity

Creativity is a term that refers to human ability to generate new ideas and express oneself uniquely (Runco & Pritzker, 2011; Sawyer, 2012). Creativity is undoubtedly a necessary component of our ability to innovate and improve the quality of our lives as individuals and as a society. As a society, our progress depends on our motivation to innovate and the creativity of our people, both of which contribute to a collective sense of well-being, stable economic growth and the ability to provide answers to financial, environmental and social crises (Villalba, 2009). In the last two years for example, we have seen how creative ideas have been developed to deal with the covid-19 pandemic, from making homemade masks to developing new ventilating machines (Cohen et al., 2021).

The importance and necessity of creativity leads to rich and extensive literature and research. Different studies bring with them different approaches towards creativity, including philosophical, cultural, linguistic, personality, cognitive and environmental aspects. Throughout history, the study of creativity has expanded and changed, and alongside studies of creativity in art and the focus on artists and their creative personality, studies have begun to examine the components of creative output and the cognitive components of creativity (Rhods, 1961).

The approach that focuses on the personality component of the creative person attempts to determine the qualities that allow the person to act creatively and / or to

produce a creative product. In these studies, for example, creativity is associated with characteristics such as high internal motivation, high energy, tendency to take risks, high self-confidence, curiosity, and independent decision-making (Barron & Harrington, 1981; Iszaj, Griffiths & Demetrovics, 2017). In addition, other studies are seeking to find the environmental factors such as socioeconomic status and religion that encourage and nurture the creative personality potential (Wallas & Gardner, 1986) as well as the motivation for creative performance (Csikszentmihalyi, 2014).

The product-oriented approach defines a creative product as having both originality and usability and measures it according to these parameters (Runco & Jaeger, 2012; Stein, 1953). Similarly, **the approach that focuses on the cognitive aspect** sees the creative cognitive process as being directed at producing a new and original product that has value for the creative person and the society around it. Cognitive studies seek to characterize creative thinking and compare it to other cognitive abilities such as intelligence and memory, as well as to examine whether there are variables that may affect creative ability to solve problems (Kandler et al., 2016).

In many cases, the type of thinking that characterizes creative performance is considered "divergent thinking" and is described as flowing in different directions and leads to finding many possible solutions. Divergent thinking is contrary to convergent thinking, which is defined as seeking to find a single, acceptable, and precise solution to a particular problem (Guilford, 1959). According to Guilford, divergent thinking is part of the creative process that leads to innovative solutions and ideas. The divergent creative thinking is a complex phenomenon in which there are secondary processes, the main ones being: fluency, flexibility and originality. Fluency refers to the amount of ideas, flexibility refers to the ability to think outside the box of familiar thinking patterns, or to switch between different patterns of thought, and originality is measured by comparison to familiar ideas (Torrance, 1974).

Guilford's model enabled an empirical examination of creative thinking using measuring tools, which led to the development of creative tests such as those of Getzels & Jackson (1962) and Torrance (1974). These and other tests are designed to measure divergent thinking and have become central and highly common both in empirical studies and in many work and education fields.

In recent decades, many labor organizations have used tests to assess and measure the potential and creative performance of job candidates and employees, in part because of the shift from production-focused work processes to knowledge-related processes. These processes have led to the understanding that creative workers are needed in order to remain in the competitive labor market (Grant & Ashford, 2008; Shalley, Zhou, & Oldham, 2004). At the same time, creativity research attempts to trace factors related to the creativity of employees to evaluate and encourage creative abilities. Many times, creativity studies use the same creativity tests aimed at measuring creative performance (Amabile et al., 2005). However, only a small part of the research has focused on **the creative process** in which creative products are created (Caniëls et al., 2014; Henker et al., 2015) or in actions that precede creative performance (Caniëls et al., 2014). In fact, the process that leads from identification and definition of problems to the creation of ideas, until almost a decade ago, has been hardly explored. (Binnewies, 2007; Shalley et al., 2004).

The creative process

The creative process can be examined by two theoretical models that divide it into a number of stages - the three-stage model and the two-stage model. **In the three-stage model**, the creative process can be divided into three stages: the first is the problem identification phase (Mumford et al., 1997; Zhang & Bartol, 2010). At this stage, the person is required to map the problem and identify goals, procedures, limitations, and other relevant information to solve the problem (Reiter-Palmon & Illies, 2004). In the second stage, the person is required to process the collected information to further understand the problem, collect additional information from a variety of sources, and save it for subsequent use (Mumford et al., 1997; Zhang & Bartol, 2010). Finally, in the third stage, the person is required to produce ideas. Thus, the information collected is rearranged into new insights and these may produce new ideas to solve the problem (Mumford, 2000).

In the two-stage model, the production of ideas is the first stage in the creative process. It is characterized by divergent thinking, in which people tend to bring up a variety of ideas on a continuum of originality and usability. **The second stage of the**

model is the evaluation of ideas, which is characterized by convergent thinking, in which people assess the feasibility and applicability of their ideas by the type of problem or task assigned to them (Campbell, 1960; Dailey & Mumford, 2006).

The ideas production stage characterizes tasks such as research and development, while the evaluation stage serves the task of implementing solutions and ideas in a practical way (Basadur, 1995).

The theoretical models of the creative process, in particular the two-stage model, demonstrate that creativity has practical aspects expressed in the organizational world. The paucity of research on the creative process, therefore, leads to a gap in both the theoretical understanding of creativity and the ability to apply it in a variety of fields. Precisely because of this, research involving the creative process will make a significant contribution both to the empirical body of knowledge about creativity and to creativity's different applications.

In addition, observing the creative process and its stages allows different factors to be examined for different parts of the process (Shalley et al., 2004; Unsworth et al., 2000). It also allows to explain and map interpersonal and intergroup differences that emerge during the creative process and may explain, for example, gender gaps and their implications in the labor market.

Gender differences in creativity

Literature in the field of creativity and gender is very broad and has various attempts to measure gender differences, explain them, find variables related to them, and examine whether they change over time. These areas have been explored in various ways, the main ones being: a. Empirical studies examining differences in creative potential in children and adults, b. Measurement of creative achievement in adults over a period of time and c. Measuring creative achievement in adults over different periods (Abraham, 2016).

Empirical studies of creative ability are inconclusive with regard to gender differences (Baer & Kaufman, 2008; Hora et al., 2021; Pagnani, 2011; Runco et al., 2010). About half found no significant differences between men and women. In the second half, on average there is a slight tendency for women's superiority in creative potential, a finding that remains consistent even when monitored by test type (verbal, nonverbal, etc.) and age (preschool, elementary, high school, etc.). From these data, it is likely that there are no significant differences in creative potential between women and men of all ages (Abraham, 2016).

However, some of the data indicate gender differences that are not expressed in creative potential, but more in creative performance and achievements for the benefit of men (Hora et al., 2021). In addition, there are studies that point to external variables that have a certain effect on gender differences in creativity, including the use of external incentives such as reward (bonus points to score) and assessment (score for creativity evaluation). These studies suggest that when it comes to boys, the incentive does not make any difference, while girls are negatively affected by it (Baer, 1997, 1998).

Abraham (2016) suggests that these gender differences in creative performance are related to the degree of intrinsic motivation used for creative performance, which is different from gender and may even explain the increasing differences between women and men in areas that require creativity as art, entrepreneurship, etc. Other explanations discussed in the literature are genetic, hormonal and brain structure related, but due to their inability to pinpoint the particular relationship between gender differences and cognitive performance, and specifically, differences in creativity performance, the more prevalent explanations are sociological and cultural (Abraham, 2016).

It is generally assumed that cultural-social influences are the ones behind gender differences in creativity, including different standards of success, inequality, discrimination, and different access to resources that may affect achievement and success in some areas (Simonton, 1994). Also, gender labeling, expectations and perceptions towards boys and girls and increased socialization of girls also influence the development of creative thinking, and differences in women and men's expectations regarding career and family. In fact, it can be seen that gender difference in the fulfillment of creative abilities is observed from the post-college age, which may

indicate that women are influenced by their societal conventions, based on expectations from this age, and do not express the commitment required to achieve creative achievements (Baer, 1999; Matud et al., 2007; Stoltzfus, 2011).

In addition, the culture has a great deal of impact on creativity performance. For example, when measuring differences between women and men in creativity in the Middle East, a moderator of modernization is found. As the level of modernization increased, women's creativity scores also rose (Mar'i & Karayanni, 1983). In this context, it is interesting to note that cultural differences, regardless of gender, were found to be related to differences in creative performance. For example, Ivancovsky et al., (2018) found that East Asian cultures show low creativity compared to Western cultures, probably due to strict self-judgment of their creative output.

It seems, then, that women have more obstacles in their path to creative performance and the realization of creative ideas, which may, among other things, explain the gender gap in entrepreneurship.

Entrepreneurship, creativity, and gender

Entrepreneurship is considered a key component that contributes to economic and social growth (Phipps & Prieto, 2015). The establishment of small businesses contributes to job creation and business competition that has a positive impact on the local economy (Baptista et al., 2008). In addition, entrepreneurship contributes to economic growth through the realization of innovative ideas (Acs et al., 2012). In the social aspect, economic growth contributes to social development and is associated with better living conditions (Audretsch et al., 2006).

Entrepreneurship is closely linked to creativity, with creativity playing a key role in the process of identifying opportunities (Ardichvili et al., 2003; Schumpeter, 1934; Shane & Nicolaou, 2015) and finding innovative solutions (Miron-Spektor et al., 2011). Schumpeter (1934) was the first to point out that entrepreneurs recognize opportunities that others do not see, and Winslow & Solomon (1993) even took it a step further and argued that creativity and entrepreneurship are the same.

Today, it is more common to talk about creative *variables* that play an important role in the entrepreneurial decision-making process (Kay, 1986), as found, for example, in Hills et al., (1997), who examined entrepreneurial perceptions and behaviors, and found that 90% of research participants claimed that creativity is important in identifying opportunities with entrepreneurial potential. Another example of how creativity is seen as an integral part of entrepreneurship can be found in a report from 2016 published by The European Commission which states that creativity should be encouraged as it is a fundamental trait in entrepreneurs (Bacigalupo et al., 2016). However, in some cases creativity alone does not predict entrepreneurial achievement (del Campo, 2017). Hills et al (1997) found, for example, that creativity plays a significant role when it comes to an individual entrepreneur but has much less impact when it comes to an entrepreneur with a network of connections. When it comes to the former, creativity is a critical part of the entrepreneurial build process, as entrepreneurs even devote time to creative thinking in their workflow. In contrast, for entrepreneurs with a network of contacts, the study's authors concluded that there is less need to be creative, due to a network of social connections that compensates for it (Hills et al., 1997).

This finding, which reflects a difference in the need for creativity between an entrepreneur with a network of contacts and an entrepreneur without a network of contacts, relates to the gender aspect. In fact, this finding is consistent with one of the most significant barriers for entrepreneurial women and is the need for a network of contacts to raise funds and meet potential investors. Women seem to have fewer connections of the kind that might help them in their entrepreneurial ways (Berger & Udell, 2003; Guzman & Kacperczyk, 2019), and in addition, they tend to be discriminated against (Constantinidis *et al.*, 2006; Guzman & Kacperczyk, 2019; Malmström *et al.*, 2017). Moreover, they are, as mentioned, less likely to take risks compared to men (Ronay & Kim, 2006), and are more likely to be affected by the way they see others in terms of criticizing their products and performance (Jin et al., 2017). In sum, it seems that while the creative potential is the same in men and women, the ability to put creative ideas into action and turn them into a profitable business is more difficult for women.

In the following chapters we will discuss more broadly the factors that make it difficult for women to reach creative achievements and realize their creative potential. We will

start with the factor of judgment in the creative process in Chapter 1, then we will continue with the risk-taking factor in Chapter 2 and in Chapter 3 we will address the factor of discrimination and stereotypes.

Chapter 1: Judgment and gender inequality: the effect of anticipated evaluation on creativity test performance of women and men

Overview

Evaluation processes take place in schools and workplaces and create a competitive environment. Seemingly, this state of constant competitiveness is useful in locating and cultivating the best students or employees, however, a competitive and judgmental environment contributes to gender inequality that may be responsible for the fact that potential ideas and products are not recognized and appreciated. The current study sought to examine the relationship between judgment and evaluation processes and gender gaps by focusing on creative performance. Two hundred and thirty-five participants (125 women) were instructed to create as many beautiful and interesting creative shapes as possible in an innovative non-verbal creativity test. For one group we manipulated the instructions of the test so that participants were told that their products would be subject to evaluation and judgment. The results indicated a significant relationship between judgment and evaluation and the creative performance of the subjects, with men being *positively influenced* by the knowledge that their creative products were subject to judgment, and women not being influenced at all. There was also a correlation between self-monitoring and creative performance. It seems that the higher the level of self-monitoring, the lower the originality of creative products. These findings call for a re-examination of the conditions under which creativity tests are conducted in the labor market and in the education system, especially where there are efforts to bring creativity studies into schools.

1.1 Introduction

Creativity is an essential component in a variety of areas in the job market. In many cases, it has even become one of the most desirable characteristics of potential candidates (Furman et al., 2020). Countries, industries, and organizations are working hard to maximize and develop the creative capabilities of their people in an effort to improve the quality of life and contribute to economic and social growth (Anderson et al., 2014; Lee et al., 2010; Nickerson, 1999; Zhou & Hoever, 2014).

Accordingly, the education system is also coming to an understanding that it is necessary to encourage and develop creativity among children and adolescents (Warren et al., 2018). Encouraging creativity in schools is likely to also promote creativity assessment processes, which have been in the labor market for a long time. The evaluation processes that take place in the labor market bring with them a competitive and judicial atmosphere that ostensibly contributes to finding the best people, services, and products, but may also produce gender bias, since judgment and competition have an asymmetrical effect on male and female candidates (Gneezy et al., 2003; Bönnte & Jarosch, 2012). It is not inconceivable that similar effects will be associated with creative assessment processes in schools, especially given that adolescents are more affected by judgment and criticism processes (Bonduelle et al., 2021; Garber et al., 2019). And when it comes to creative potential, inequality can have far-reaching implications that may start in the education system and finally affect the status of women in the labor market, particularly in areas where there is an increased demand for creativity such as entrepreneurship, innovation, and the high-tech industry (Henriksen et al., 2019).

Thus, understanding how judgment and competition affect the creative potential of men and women differently is especially important in designing both an egalitarian work environment and education system, as well as encouraging discourse on the different ways in which gender gaps are created and how they can be reduced.

The current study sought to address this need and examine the relationship between creativity and gender in a judgmental versus non-judgmental environment while focusing on the **creative process**-- the process by which a creative idea becomes a viable product that faces evaluation and judgment. There are several models for the creative process. In the present study we have chosen to focus on the two-stage model that divides the process into a first stage of idea generation and a second stage of idea evaluation. In the first stage, the participants use divergent thinking and generate ideas, and in the second stage, they use convergent thinking in order to judge and evaluate their ideas before presenting them (Campbell, 1960; Dailey & Mumford, 2006). The creative process receives very little attention in the research literature on creativity in the labor market. Much research is devoted to the creative performance of employees and the evaluation of creative products, but very little has been researched and written

about the creative process itself, the steps and actions taken to bring about creative products, and what may change or affect the various stages. Even less has been studied about the gendered aspect of the subject.

The current study sought to address this gap in the literature, by focusing on the creative process and gender, and by using an innovative test of creativity. The new test allows division and analysis of the creativity stages separately, thus allowing us to understand where and how gender gaps are expressed in the creative process. In practice, we tested whether there would be differences in the creative performance of women and men as a result of an experimental manipulation designed to make subjects think that their products were subject to judgment. We also examined whether self-monitoring, defined as the degree to which people are sensitive to the opinions of others about them and change their behavior accordingly, was related to performance in the creativity test.

Competition, judgment, and creativity

The connection between creative abilities and a judgmental environment has been extensively researched in the fields of social psychology. Theresa Amabile and her colleagues, for example, have found in a variety of studies that an environment where there are elements of judgment and evaluation adversely affects creative performance (Amabile et al., 1996). The theoretical model created by Amabile presented how personal abilities such as expertise, creative thinking ability, and intrinsic motivation interact with social environment components and influence creativity. According to Amabile, intrinsic motivation is necessary for creative performance, as it is the basic component of engaging in creative activity. However, at the same time, there may be a situation where employees in the organization, with high creative potential, fail to fulfill their creative potential as a result of an environment that does not encourage creativity (Amabile, 2013).

One way the organization climate might discourage creativity, according to Amabile, is through a requirement for creative activity out of external motivation, defined as motivation based on an external reward, deadline, or negative anticipated evaluation. In such a case, when motivation is only external, creative performance is impaired (Amabile, 2013). Such and similar findings were also reported in Shalley and Perry-Smith's study who found that creative performance is impaired when participants

expect a critical assessment compared to an informative assessment without judgment and criticism (Shalley & Perry-Smith, 2001).

1.1.2 Creativity, judgment, and gender

Many individuals assume that men are more creative than women or at least attribute more creativity to products made by men compared to women (Luksyte et al., 2017; Proudfoot et al., 2015). However, the findings of empirical studies on creative ability are inconsistent with this belief and are more ambiguous (Baer & Kaufman, 2008; Pagnani, 2011; Runco et al., 2010). About half of the creativity-gender studies found no significant differences between men and women. In the second half, the findings are varied but on average there is a slight tendency for women to excel in creative performance, a finding that remains consistent even when monitored by type of test (verbal, non-verbal) and age (kindergarten, primary school, high school, etc.). Similarly, Warren et al., (2018) found in their study that gender did not constitute a basis for difference in creative performance.

However, there are studies that suggest that other variables affect creative performance. Warren et al., (2018) for example, summarized findings that indicated that creativity is certainly influenced by environmental expectations, cultural stereotypes and social processes that are also related to cognitive processes. Another example is in Amabile (2013) who found that external variables have some effects on gender differences in creativity, including external incentive such as a reward (bonus points for a score) and an assessment (a score for evaluating creativity). Contrary to Amabile's general findings, Baer (1997; 1998) found that an incentive had not affected boys, whereas for girls it was negatively related to performance, a finding that may explain the growing differences between women and men in areas that require creativity such as art and entrepreneurship (Baer, 1997, 1998). Another possible explanation takes into account women's reluctance to compete and lack of motivation to enter competitive (Croson & Gneezy, 2009; Flory et al., 2015; Niederle & Vesterlund, 2007, 2011) or judgmental situations (Bear et al., 2017; Roberts & Nolen-Hoeksema, 1994), and suggests the possibility that women, more than men, tend to attach great importance to how society values them and change their behavior accordingly (Abraham, 2016). We sought to test

this hypothesis in the current study by comparing men's and women's scores in a personality construct called self-monitoring.

1.1.3 Creativity, gender and self-monitoring

Self-monitoring refers to the degree to which a person controls and directs his or her behavior according to the cues he or she receives from the environment (Lennox & Wolfe, 1984; Snyder, 1979). People who are classified as having high self-monitoring attach great importance to the impression they leave on others and therefore will systematically try to adapt to the society around them and the situation in which they find themselves. As a result, they tend to change their behavior frequently depending on the situation and the cues they receive. In contrast, people classified as having low self-monitoring will seek guidance for their behavior within themselves. They are less sensitive to the behavior of others and lack the skill to display a wide range of behaviors. Consequently, people with low self-monitoring will remain consistent in their behavior within different societies and throughout different situations (Snyder, 1987).

Self-monitoring is a significant personality trait in the labor market and has been extensively researched (Kudret et al., 2019). Among other things, it has been found to be related and predict leadership ability and, in some cases also work performance (Day et al., 2002). However, in many cases there are additional variables that mediate its impact. For example, self-monitoring predicts a negative relationship with job performance when it comes to a manager's assessment of his subordinate who does not belong to the same national identity (Caligiuri & Day, 2000).

Regarding creativity, very few studies have examined the relationship between creativity and self-monitoring. The most notable of which has shown that self-monitoring may be a significant variable when it comes to producing ideas that are about to be evaluated (De Vat & De Dreu, 2007). The researchers found that participants who were asked to express their creative ideas out loud, compared to those who did so in silence, exhibited lower performance, especially those who were more sensitive to environmental criticism and had high self-monitoring (De Vat & De Dreu, 2007). As for the relationship of self-monitoring with gender, one study suggests that men have higher self-monitoring than women (Frazier & Fatis, 1980). Other studies, however, reflect a more complex picture in which the interaction between gender and

self-monitoring can predict a variety of phenomena (Cramer & Gruman, 2002) including leadership (Anderson & McLenigan, 1987) and job performance (Anderson & Thacker, 1985).

Self-monitoring also varies according to culture and tends to be higher in individualistic cultures compared to collectivist cultures (Gudykunst et al., 1989). Similarly, the relationship between self-monitoring and creativity may be complex and variable when gender is included in the analysis. Specifically, self-monitoring may affect creativity in a more complex way if we analyze performance according to the two-stage model mentioned in the context of the creative process. An example of this type of analysis was found in a study that examined the relationship between the creative process and creative performance in different cultures and found that there is a difference in both performance and evaluation of creative outcomes, with people from western cultures tending to higher performance and evaluations than people from eastern cultures (Ivancovsky et al., 2019).

In the current study, we have chosen to examine creative performance in the two creativity measures corresponding to the creative process stages. Fluency, that is the number of ideas, is corresponding to the first stage, the 'idea production' stage. Originality, which requires some evaluation of the generated ideas, is corresponding to the second stage, the 'idea evaluation'. The use of the Creative Foraging Game (Hart et al., 2017), the innovative non-verbal creativity test we used, allowed us to examine the two stages separately and the degree of originality of the ideas in each of the stages. We assumed that we would find a complex picture in which the element of judgment would have a greater impact on the participants with high self-monitoring, so that their performance would be impaired at the idea evaluation stage and expressed in lower originality scores than in the control group and compared to low self-monitoring participants.

1.1.4 Research overview

The findings from the literature reviewed above suggest a possible relationship between judgment, creativity, and gender, and formed the conceptual and theoretical framework for conducting the current research. The study sought to systematically examine

whether and to what extent gender gaps in creative performance would appear in cases where an emphasis was placed on achievement and judgment, compared with cases in which no such emphasis was made.

In practice, the instructions of a non-verbal creativity test (Hart et al., 2017) were modified to generate two conditions. In the experimental condition, the instructions contained a sentence that tells the subjects that their creative products are about to be judged and evaluated by judges and that they will receive a grade for the degree of creativity they demonstrated. In the neutral condition, the sentence was omitted.

In addition, all subjects completed a questionnaire designed to measure the degree of their self-monitoring before taking the creativity test (Gangestad & Snyder, 2000).

The research hypotheses were:

- a. No differences in the creativity performance of men and women will be found in the neutral condition.
- b. Judgment and evaluation in the experimental conditions would affect men and women differently, with women's creativity performance tending to be impaired and men's performance remaining the same.
- c. Self-monitoring will be a significant moderator on the relationship between experimental conditions and creative performance in such a way that higher self-monitoring predicts poorer performance.

1.2 Method

1.2.1 Participants and design

235 participants (125 female, mean age 28, 109 males, mean age 27) took part in an online study. Nineteen participants were excluded from analysis having not completed all parts of the experiment. The study was a 2 x 2 between-subject design with the independent variables gender and the experimental conditions (with judgment, without judgment). Self-monitoring score served as a covariate in the Anovas. Participants were randomly assigned to one of the experimental groups. The study was approved by the ethics committee of the department of Psychology at Bar Ilan university.

1.2.2 Measures

Self-Monitoring scale

Participants completed the original 25-item revised self-monitoring scale (Gangestad & Snyder, 2000; the items are presented in Appendix 1), which measures two dimensions of self-monitoring: actor and other-directed. The actor scale measures the degree to which an individual reports having the ability to put on a social performance, and the other-directed scale evaluates the degree to which individuals modify their behavior for the benefit of other people or contexts. Both scales were found to be reliable (actor: $\alpha = .79$; other-directed: $\alpha = .73$). The self-monitoring scale was found to be highly correlated with the 44-item Big Five Inventory (John, Naumann, & Soto, 2008). The items measuring each dimension were found to be reliable (neuroticism: $\alpha = .81$; extraversion: $\alpha = .87$; conscientiousness: $\alpha = .80$; agreeableness: $\alpha = .75$; openness: $\alpha = .75$) (Gangestad & Snyder, 2000).

Creative Foraging Game

The game of shapes, developed at the Weizmann Institute by Yuval Hart and others (Hart et al., 2017), is a computer game in which participants can move ten squares to create different shapes (see figure 1). There are over 30,000 possible shapes to create. The original game instructions are to create beautiful and interesting shapes and save shapes they think are the most interesting and beautiful to a gallery. The information about the shapes is saved and analyzed to create a variety of variables such as the time and the number of steps between the creation of different shapes. The game is non-verbal and produces fluency scores (the number of ideas) and originality. In addition, the game is divided into several execution stages that allow the examination of differences across several stages of the creative process. In the current study, the data were analyzed to produce a measure of the number of saved shapes (fluency) and their degree of originality relative to the shapes created by the other participants in two stages of the creative process – creating ideas and choosing the top 5 ideas for evaluation. For example, if a participant created 5 shapes, he would receive a score of 5 on the fluency measure. The originality measure is calculated so that each individual shape receives a relative score derived from the number of times the same shape was created by the other participants in the sample. After that, an average score of the degree of originality of

all the shapes created by the participant is calculated and a final originality score is determined. The test was compared with Guilford's Alternative Uses Test (1978) and found a positive correlation between the tests (Kenett et al., 2021).

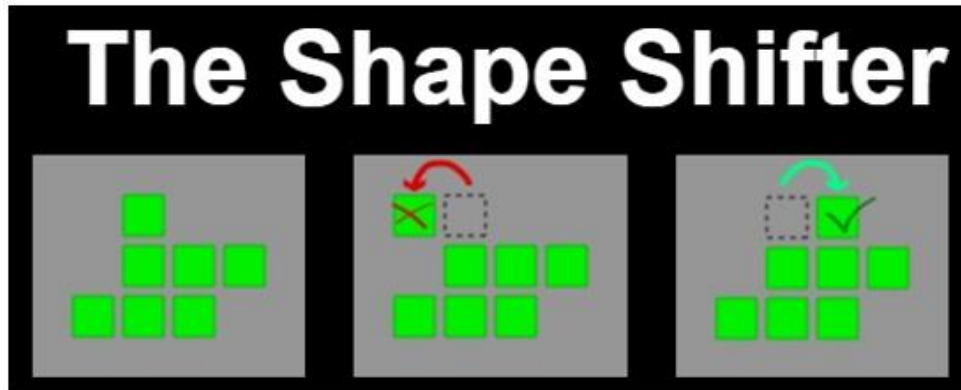


Figure 2. Illustration of The Creative Foraging Game

1.2.3 Procedure

Participants responded to a social media post that invited them to take part in a study about creativity to win a small payment. After entering the research website, they filled out a demographic questionnaire and the self-monitoring questionnaire and were given instructions for performing the creativity test called the Shape Game (Hart et al., 2017). The instructions were slightly different according to the experimental group, to which the participants were randomly assigned. Both groups were told to produce as many beautiful, creative, and interesting shapes as possible, but an added line to the instructions of the experimental group said the shapes would be evaluated by judges.

1.3 Results

The study was a 2 x 2 between-subject design with the independent variables gender and the intervention conditions (with judgment, without judgment). Participants were randomly assigned to one of the experimental groups. One hundred and fifteen participants in the experimental group and 101 in the control group who did not differ on gender distribution and age, as detailed in Table 1. However, there was a gender difference in self-monitoring ($T(216)=-2.79, p=.006$), with higher self-monitoring scores reported by women (mean = 3.30, $sd=.68$) than men (mean=3.07, $sd=.56$), and therefore it was included as a covariate in the general analysis of gender and creativity.

We started by analyzing self-monitoring differences between men and women and examining the correlation between the experimental variables and self-monitoring. The dependent variable, creativity, was analyzed according to the two main indices—fluency and originality, and self-monitoring was added as co-variate since it interacted with gender and was found to be significantly relate to creativity.

Table 1

Gender distribution, mean age and self-monitoring scores in the experimental conditions

variable		control group (N=101)	Experimental group (N=115)	participants (N=216)
gender	women	51 (51%)	64 (56%)	115
	men	50 (49%)	51 (44%)	105
Age	women	27	28	115
	men	28	27	105
Self- monitoring	women	3.32	3.29	115
	men	3.11	3.03	105

1.3.1 Self-monitoring

To explore the links between self-monitoring and creativity, an analysis was performed to examine the correlation between self-monitoring and the measures of creativity—fluency and originality. The results of Pearson correlation indicated that a positive (actually negative, since the originality scores are on reversed scale) relationship was found between self-monitoring and the originality measure [$r(216) = .192, p < .05$] which suggests that the higher the participants' self-monitoring, their creative performances are *less original*. However, no relationship was found between self-monitoring and the fluency measure [$r(216) = -.03, p = .70$].

Self-monitoring was also used as a covariate in the main analysis below

1.3.2 Judgment, creativity, and gender

In order to examine the effect of **experimental conditions** (with judgment / without judgment) and **gender** (men / women) on the indices of creativity— fluency and

originality we conducted a 2x2 multivariate analysis of variance (MANCOVA) while self-monitoring served as a covariate.

The results of the analysis revealed a **significant multivariate effect for gender**: $F(2,210) = 4.09$, Wilks' $\Lambda = .96$, $p = .018$, partial $\eta^2 = .04$. In addition, a **significant multivariate interaction of Gender x Experiment Conditions** was obtained: $F(2,210) = 3.90$, Wilks' $\Lambda = .96$, $p = .022$, partial $\eta^2 = .04$. However, no significant multivariate effect was obtained for the experimental conditions: $F(2,210) = .61$, Wilks' $\Lambda = .99$, $p > .05$, partial $\eta^2 = .01$.

Univariate variance analyzes for **Gender** elicited a significant effect for both **fluency**: $F(1,211) = 6.94$, $p = .009$, *partial* $\eta^2 = .03$ and **originality**: $F(1,211) = 4.68$, $p = .032$, *partial* $\eta^2 = .02$ as can be seen in Figures 2 and 3. In the fluency measure, on average, men ($M = 22.79$, $SD = 16.874$) performed better than women ($M = 17.50$, $SD = 11.37$). Similarly, in the originality measure, men on average ($M = 18.54$, $SD = 8.53$) performed better than women ($M = 21.83$, $SD = 9.69$)¹.

As for the interaction found in the multivariate analysis, univariate variance analyzes elicited a **significant interaction effect of Gender X experimental conditions** for both fluency: $F(1,211) = 5.39$, $p = .021$, *partial* $\eta^2 = .03$ and originality: $F(1,211) = 5.84$, $p = .016$, *partial* $\eta^2 = .03$.

In addition, the multivariate analysis revealed a significant effect for the covariate - self-monitoring $F(2,210) = 3.88$, Wilks' $\Lambda = .96$, $p = .022$, partial $\eta^2 = .04$. Univariate analyzes of variance revealed that the analyses is significant only for the originality index $F(1,211) = 6.11$, $p = .014$, partial $\eta^2 = .03$, but not for the fluency index.

Post-hoc analyses

To examine the source of the interaction for the fluency measure, Bonferroni post-hoc analyses was performed which showed that in the **judgment condition**, there was a significant difference ($p < .001$) between men and women, so that men's performance was significantly better than those of the women. However, **in the no-judgment condition, no significant difference was found between men and women** ($p > .05$). Similarly, in the originality measure analyses we also found a significant difference between men and women in favor of men in the judgment condition ($p = .001$) compared

The scale of creativity performance in the originality measure is reversed ¹

to the no-judgment condition, where there was no significant difference in the performance of men and women. Descriptive statistics are presented in Table No. 2

Table 2

Post-hoc analyses: Interaction of gender and experimental conditions

	men (N=105)		women (N=115)		F	p
	With judgment	Without judgment	With judgment	Without judgment		
fluency	22.79(16.87)	19.52(12.72)	16.41(10.98)	18.88(11.80)	6.94	.009
originality	16.49(7.09)	20.64(9.41)	22.64(10.17)	20.82(9.05)	4.68	.032

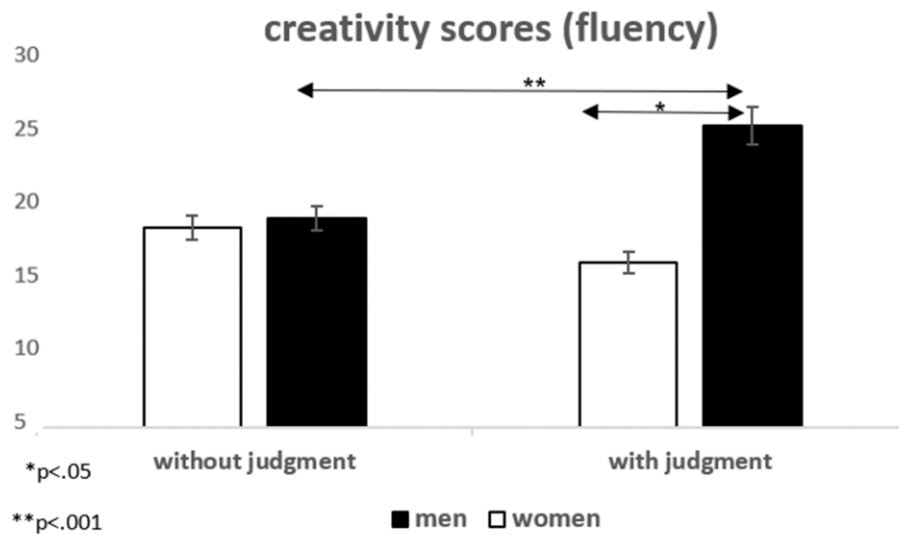


Fig.3. Mean creativity test scores and standard errors in the fluency index in men and women in the different experimental conditions-- with judgment and without judgment.

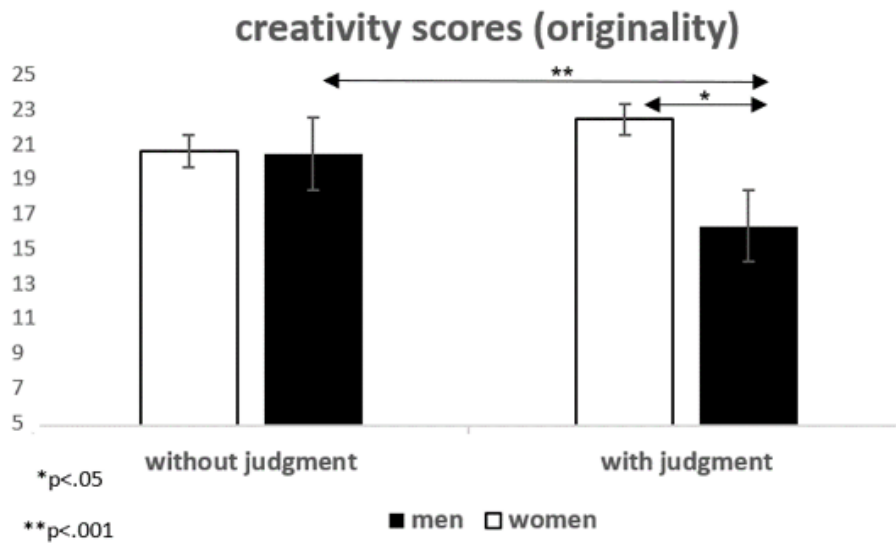


Fig.4. Mean creativity test scores and standard errors in the originality index in men and women in the different experimental conditions-- with judgment and without judgment (scores are in reversed scale, higher score=less originality)

1.4 Discussion

The current study sought to examine whether a gender gap would appear in the performance of a creativity test under two conditions— one condition in which the test instructions state that the creative products are to be evaluated by judges, and a control condition without mentioning of evaluation and judgment. We hypothesized that no differences in creative potential would be found between men and women in the control condition, but that in the experimental condition that included evaluation and judgment, women's performance would be compromised compared to those of men.

The results reflect previous findings that have shown a gender difference in attitudes toward competitive and judicial situations. However, in contrast to previous findings that revealed impairment in the performance of women in situations of competition (Croson & Gneezy, 2009; Flory et al., 2015; Niederle & Vesterlund, 2007, 2011) and judgment (Bear et al., 2017; Roberts & Nolen-Hoeksema, 1994), our findings seem to indicate that women's performance remained similar to the control condition (where

judgment of their performance is not expected), while *men's performance has improved significantly*. Apparently, men invested more effort than women and outperformed them when they anticipated an evaluation of their creative products. The findings also showed, as we hypothesized, that the performance of women and men in the creativity test was similar in the neutral condition when no emphasis was placed on evaluation and judgment. In addition, we hypothesized that self-monitoring would be a significant mediator that could predict to some extent the differences in performance and indeed, high self-monitoring reduces originality. Although reported self-monitoring was significantly higher for women than men, its decreasing effect on creativity was found for both men and women.

The picture emerging from the data reflects a significant gender gap resulting only from a slight change of task instructions. The results can be attributed to the fact that women and men have a different attitude towards situations with characteristics of judgment and competition. However, unlike previous studies that have shown that women will be harmed as a result of judgmental situations, in the present study, it seems that what requires explanation is the improvement in men's performance as it is what actually created the gender difference in results.

The current study contributes to understanding the relationship between gender and self-monitoring and creative performance. Across genders, high self-monitoring seems to have predicted a decline in the originality of creative products. From this perspective it can be argued that those with high self-monitoring (especially women in the present sample), who are more sensitive in advance to the opinions of others, have been adversely affected by the idea of anticipated evaluation. The finding support the already stated claims regarding a gender difference in response to judgment situations that put women in a more vulnerable position compared to men (Croson & Gneezy, 2009). However, the relationship with self-monitoring suggest that what underlies the difference in creative performance in the different experiment conditions alongside gender is the individual tendency to be influenced by the environment. This is an important perspective as it expands and enables the examination of other variables beyond gender.

The significant improvement in male performance might be related to the specific visual-spatial properties of the shapes game and may be explained using motivational achievement theory (Atkinson & Feather 1966; Atkinson, 1974). The Theory suggests that the ability to anticipate success in a particular task, brings with it enthusiasm and motivation to engage in it. Richardson and Abraham (2009) found a relationship between motivational achievement and student scores and claim that students who expected success performed better and were able to maximize their abilities (Richardson & Abraham, 2009). This theory may explain the high performance of men compared to women in the judgment condition. The judgment process of the creativity test, like evaluation processes to other tests practiced in schools or the labor market, created a situation where subjects thought they would receive a score on their performance, and at this point the element of expectation entered. Depending on the degree of expectations for success, a difference in motivation and achievements could be seen. The Creative Foraging Game test might have produced different expectations for success in women and men being a non-verbal test with characteristics that require spatial vision. As described earlier, the test has a graphic interface where a player has to move 10 cubes in order to create different shapes. Historically, men and women have different abilities in the field of spatial vision that have created over time gender stereotypes about the field (Brown et al., 1997; Rivers et al., 2021; Wulandari & Hendrawan, 2021). It is quite possible that the stereotype caused men to expect success in a familiar arena (online visual-spatial game) and in a task they know they are good at, compared to women who did not expect much success and therefore did not have the same motivation.

In social psychology, it is customary to use the concept of "stereotype threat" to explain how stereotypes negatively affect the performance of different populations, including women (Niederle, & Vesterlund 2011). Here, although we did not see a negative effect on women's performance, we certainly saw that women were denied the positive effect of judgment and this is also an example of threat caused by a stereotype, even if not in the common way we are used to seeing.

Finally, another perspective views the findings as a result of earlier and broader processes that put a number of factors at the center. Factors such as socialization processes and differences in educational approach towards boys and girls, can explain

men's tendency to be more successful in situations of judgment and competition compared to women (Baer, 1999; Rippon, 2019). From an early age, educational and social-environmental processes seem to encourage boys, overtly or covertly, to exhibit "masculine" behavior that includes independence and competitiveness. Girls, on the other hand, are encouraged to exhibit "feminine" behaviors such as cooperation, care, and nurturing (Eagly & Wood, 2012; Eagly & Steffen, 1984). In light of this difference, the findings of the present study are not surprising, as well as the extensive literature indicating gender differences in attitude and motivation to participate in competitive activities.

1.4.1 Limitations

As with any empirical study, this study also has limitations. First, we note that the study was conducted online which made it difficult to perform screening process of the subjects and monitor the performance in real time. Still, we made an effort to make sure the subjects were as similar as possible in the relevant variables and performed statistical analyzes to make sure there were no differences between groups. Second, the creativity task was conducted under laboratory conditions rather than natural conditions, therefore cannot link it to actual creativity performance in the labor or education worlds. In the future, it is desirable that similar studies be conducted under natural conditions, whether in schools or in the labor market. Third, we used a creativity test whose characteristics might have a gender bias, though the game creators did not report such bias until now (Hart et al., 2017; Kenett et al., 2021). In the future it will be necessary to repeat the experiment with different tests with different characteristics.

1.4.2 Summary and conclusions

Gender inequality still exist in a variety of areas, including the education system (DiPrete & Jennings, 2012; Legewie & DiPrete, 2014) and the labor market (Padavic et al., 2020). One way to reduce the gender gap is through studies that strive to understand the circumstances and processes leading to its formation. In the current study, we found a gender gap in performance as a result of a bias we created by slightly changing the instructions of a creativity test designed to measure creative potential, a basic and popular tool in evaluation processes in many organizations, and in the near future probably also in the education system.

This easily created bias means that the structure of the test and its guidelines may lead inequality in assessing the potential of male and female students solely due to the inability to properly assess their creative potential under judgment. Furthermore, bias in the test may cause the results not to truly reflect the measured trait (creativity in this case), but rather to combine it with other traits and characteristics unintentionally (e.g., the response to judgment), which significantly affects the test validity.

Consequently, the test may act as a tool for preserving stereotypes, in this case, using the test results (which are actually biased) to reinforce stereotypes about gender gaps in creative potential. Hence, it is important to locate places, behaviors and processes that are sensitive to gender and other biases, and to regularly verify their ability to provide equal opportunity to a variety of populations.

Furthermore, it is important to understand the origin of the biases, in order to plan and build tasks in a way that will not give an advantage to one group or another. In the current study, we suggest that behind the bias there are some prevalent explanations for the differences between men and women in situations where their products are subject to judgment and evaluation. One explanation relates to the degree of motivation that subjects invest in a task according to their expectations of success in it. Another explanation relates to the degree to which they give importance to others' opinions and change their behavior accordingly (self-monitoring); a third explanation sees the findings as a result of early and broad processes of socialization. In the future, we would like to examine in depth the various explanations in order to understand and reduce gender biases in tests.

Chapter 2: Exploring the interactive influence of risk taking and gender on creativity

Overview

Creativity is a key component in entrepreneurship and innovation. Creative processes often involve some degree of risk-taking that is considered an integral part of them. However, men and women differ in their tendency to take risks, which potentially might explain the gender gap in creative achievements. The present study sought to add to the literature examining the relationship between creativity and risk-taking two additional aspects – first, the use of the variable “risk-taking” as an operational manipulation rather than an existing trait, and the second aspect is gender.

The results showed that the manipulation to increase risk-taking had a *positive effect* on women's creativity scores on the verbal AUT test *and a negative effect* on men's. In addition, Women who were primed to take risks created products faster than women who were not primed while men's average production time did not differ. The findings indicate that risk-taking manipulation can enhance creativity. However, it is important to consider the possible asymmetric effect on women and men. Further research is therefore needed to fully understand the relationship between creativity, risk-taking and gender while examining different types of risk-taking tasks and different types of creativity tests.

2.1 Introduction

2.1.1 Creativity and risk-taking

The relationship between creativity and risk-taking is important for understanding innovation processes (Shen et al., 2018). Creative processes often involve some level of risk-taking, whether these occur in interpersonal relationships, in the development of technological inventions, or in medical breakthroughs (Baas et al., 2015; Sternberg & Lubart, 1992). Nevertheless, only a minority of empirical studies examined the relationship between creativity and risk-taking (Tyagi et al., 2017), and just a few of them explore this relationship along with gender influences.

Most studies that have examined the relationship between creativity and risk-taking have indicated that risk-taking is an integral part of creativity (Dewett, 2007; Eisenman, 1987; Feist, 1998; Sternberg & Lubart, 1992). Accordingly, certain theories of creativity also include an element of risk-taking, including "achievement motivation theory" (Dewett, 2006; Zhou & George, 2001) and "investment theory" (Sternberg, 2006; Sternberg & Lubart, 1992). In addition, risk-taking seems to be directly related to organizational innovation. March and Shapira (1987), for example, found a direct relationship between risk-taking and innovative performance in organizations, as well as Latham and Braun (2009). Moreover, a positive relationship was found between managers with a tendency to take risks and innovative performance at the organization level (Ling et al., 2008).

At the same time, it seems that the relationship between risk-taking and creativity may depend on the various metrics used. Tyagi and colleagues (2017) examined the relationship between creativity and risk-taking using five different risk-taking metrics and five different tests for measuring creativity. They have found that the relationship exists only when it comes to risk-taking in the social aspect, and specific two creativity measures related to creative personality and idea creation. In their paper, they called for a more accurate study of the relationship between the various aspects of creativity and risk-taking and noted that the field requires further research (Tyagi et al., 2017). In response to the growing need in the academic literature to better understand the link between creativity and risk-taking, the current study sought to further examine this association and add two significant aspects-- one is the use of risk-taking as an experimental manipulation, not just as a trait or tendency, and the second aspect is examining the connection between creativity and risk-taking while referring to another significant variable-- gender.

2.1.2 Risk-taking and gender

When it comes to gender, there is almost a consensus about the tendency of women to take less risks than men, in a variety of contexts and areas (Byrnes et al., 1999; Charness & Gneezy, 2012). Nevertheless, gender differences appear to be relatively small when measured in the laboratories, compared to differences in the level of risk-taking in

everyday reality when men tend to engage in dangerous sports and are involved in accidents several times more than women (Byrnes et al., 1999). In addition, men tend to take more risk in economic investment contexts (Charness & Gneezy, 2012), and other contexts like managerial decisions as found by Faccio et al. (2016) who reported that when a male CEO was replaced by a female CEO, greater avoidance of economic risks was observed at the level of organizational decisions (Faccio et al., 2016).

2.1.3 Risk-taking, gender and creativity

Given that there is an almost necessary link between risk-taking and creativity (see for example Dewett, 2006), and women tend to take fewer risks, the triple link between creativity, risk-taking and gender may be as complex and interesting as Jin et al. (2017) suggested. In their study, they found that although women are as capable of producing innovative ideas as men, they are less likely to execute their ideas. The reason is, according to the researchers, that particularly innovative ideas tend to require more risk-taking in their implementation, while women in general are less likely to take risks compared to men. In addition, the researchers speculate that women are more concerned about social consequences if they are perceived as overly ambitious as they try to implement particularly innovative ideas. As a consequence, they tend to present 'novelty avoidance', as they consciously choose less innovative ideas for realization (Jin et al., 2017).

Women's tendency to take less risk and eventually choose less novel ideas may also be reflected in the creative process itself. **The creative process** refers to the process in which creative products are generated (Caniëls et al., 2014; Henker et al., 2015) or the actions that precede creative performance (Caniëls et al., 2014). The creative process can be examined by several theoretical models that divide it into a number of stages. **In the two-stage model**, which is relevant to our study, **the production of ideas is the first stage** in the creative process. It is characterized by divergent thinking, in which people tend to bring up a variety of ideas on a continuum of originality and usability. **The second stage of the model is the evaluation of ideas**, which is characterized by convergent thinking, in which people assess the feasibility and applicability of their ideas by the type of problem or task assigned to them (Campbell, 1960; Dailey & Mumford, 2006).

When it comes to creativity tests, the expectation is that at the end of the creative process, people will select their best ideas for evaluation. However, if women will show 'novelty avoidance' there may be a difference in their level of performance in the two stages of the creative process. In the idea evaluation stage, higher 'novelty avoidance' in women might lead to more conservative decisions, therefore selecting less original ideas from the ideas generated at the first stage. If this is the case, this 'novelty avoidance' tendency may be affected by a risk-taking manipulation designed to enhance the tendency to take risks and help women present their most original and novel ideas.

In conclusion, all the reviewed findings above suggest that there is a connection between creativity, risk-taking and gender and that it is important to establish the nature of this connection to see its effects and consequences. The present study sought to contribute to the literature examining the relationship between risk-taking and creativity in general, and with respect to gender. The study novelty is by addressing risk-taking as an operational variable. The possibility of manipulating the tendency to take risks entails an opportunity to test empirically whether an increased tendency to take risks will directly affect creative performance, and how this manipulation will affect the idea generation in comparison to idea selection stage in the two stages creativity model (Runco & Acar, 2012). Furthermore, the study aims to see whether the risk-taking effect will be different for men and women,

For this purpose, a laboratory research was designed to include a risk-taking operational manipulation followed by a creativity test. Two tests of creativity was used, one verbal and familiar, the AUT-Alternative Uses Test developed by Guilford and colleagues (Guilford et al., 1978), and the other is a non-verbal test called "The Creative Foraging Game" (Hart et al., 2017). Both tests were chosen as they explicitly allow to examine the two stages of the creative process and help us test the 'novelty avoidance' concept. **The research hypothesis was** that there would be an interaction effect of the experiment group and gender, as the manipulation will help women more due to their baseline lower risk-taking tendency.

2.2 Method

2.2.1 Participants

Three hundred and ninety-one people participated in the study between the ages of 18-50 with an average age of 29. Sixty-two participants were removed from the analyses as they did not complete all parts of the study. The final analysis included 325 participants, 130 women of average age 27, and 195 men of average age 31. The study was approved by the ethics committee of the department of Psychology at Bar Ilan university.

2.2.2 Measures

AUT-- Alternate Uses Test

The test of alternative uses is a classic test for measuring creativity (Guilford et al., 1978). The test has a variety of variations, all of which present the subjects with everyday objects such as a shoe, a button, a pin and a drinking glass, and the subjects are asked to indicate as many creative and original uses for the presented objects as possible. The test produces several measures of creativity, including flexibility, originality, and fluency. The test is reliable (0.86) and adapted for adults (Guilford et al, 1978).

For the current study, we selected two useful objects— a hat and a fork and asked the subjects to write as many creative and original uses as possible for each object in 6 minutes.

The Creative Foraging Game

The Creative Foraging Game (CFG) is a computer game designed to measure creative inquiry and creative performance (Hart et al, 2017). Participants are required to produce innovative and creative solutions by moving ten squares in a defined outline of options into shapes that they think are “beautiful and interesting.” The test is non-verbal and suitable for online use and includes two stages, a stage of creating shapes and a stage of choosing 5 of them that in the participant's eyes are the most creative, beautiful, and interesting for a gallery. In addition to the traditional creativity measures of fluency and originality, it allows the measurement of other variables and a comparison of originality scores in the overall bank of the shapes to the 5 shapes selected for the gallery. The test

was compared to Guilford's Alternative Uses Test (1978) and found a positive correlation between the tests (Kenett et al., 2021).

The choice of The CFG has given us several advantages in examining the connection to risk-taking and gender. First, it allowed an examination of performance differences between a verbal and non-verbal test, since some of the research on creativity and gender points to women's advantage in verbal metrics (Baer & Kaufman, 2008; Cheung & Lau, 2010). Furthermore, it allowed us to examine the effect of the intervention on the different measures of the game and to compare the scores with respect to gender and finally, the test allowed us to examine the research hypotheses and the assumption of women's 'innovation avoidance' in both stages of the creative process.

Risk-taking questionnaire

The questionnaire is based on the Choice Dilemma Questionnaire (Kogan & Wallach, 1964). The original questionnaire contains 11 items that present a dilemma on various topics such as: job offer, investing in stocks, choosing between universities, having unprotected sex, drinking alcohol, extreme sports, and drug use. For each dilemma, subjects must choose between two options, one of which involves risk. Subjects should assess the likelihood that they will choose an option that includes a risk on a scale of 1-10. For the present study, five topics were selected: job offer, speeding, aggressive behavior, investing in stocks and sports and an average score was calculated for each subject, indicating the "tendency to take risks". the questionnaire is presented in Appendix 2

Risk-taking manipulation

The priming task was reported by Gino et al., (2011) and is based on 'Ego depletion theory'. According to the theory of ego depletion, self-control is a depleting mental resource, therefore once people are put through a process in which they experience a need for self-control, as happens in a frustrating task like the one we used in this study, they may, at the end of the process, be in a situation where their decision-making process is different, more free from inhibitions. Therefore, it is not surprising that ego depletion leads to increased risk taking as demonstrated in Bishop's (2017) study that showed how an ego depletion manipulation led participants to make more risky decisions than those who did not undergo the manipulation (Bishop. 2017).

In the current study the task used for ego depletion was to write a short story without using two letters. In the experimental group, participants were asked to avoid writing two letters that are very common, a task that is considered difficult and has elements of ego depletion which, as mentioned, is associated with an increase in risk taking (Fischer et al., 2012). In the control group, participants were asked to refrain from writing two letters that are rarely used in the written language. Participants were randomly assigned to the experimental and control group.

2.2.3 Procedure

Participants were recruited through social media posts calling for participation in an online experiment on creativity for a fee. The experiment consisted of three parts. In the first part, participants filled out consent forms and a demographic questionnaire, in the second part they performed the writing task according to their experimental group – risk taking manipulation or control. After the writing task, they completed a risk-taking questionnaire as a manipulation test, and to measure individual risk-taking score. Finally, participants performed one of the creativity tests— the AUT or The Creative Foraging Game.

2.3 results

The study was a 2 x 2 between-subject design with the independent variables gender and intervention conditions (enhanced risk taking, control). Participants were randomly assigned to one of the experimental groups.

Overall, there were 157 participants in the enhanced risk-taking experimental group and 168 in the control group, who did not differ on mean age and gender distribution as detailed in Table 3. However, a difference was found between the groups in the variable "income" and therefore it was included in the analysis as covariate. The dependent variable, creativity (in the AUT and The CFG), was analyzed according to the two main indices— fluency (idea generation stage) and originality (idea selection stage). In the CFG additional factors were analyzed as detailed below.

Table 3

Gender distribution and mean age in the experimental conditions

variable		control group (N=168)	Experimental group (N=157)	participants (N=325)
gender	women	62	68	130
	men	95	100	195
Mean age	women	28	27	27
	men	32	32	32

2.3.1 Risk taking – manipulation validation

In order to test the validity of the manipulation a T-test was performed for independent samples that compared the risk-taking scores in the experimental group and the control group. The findings indicated that risk-taking scores were significantly affected by the manipulation ($T(323) = -2.07, p = .039$). The results showed higher levels of the tendency to take risks in the experimental group ($M = 3.60, SD = .93$) compared to the control group ($M = 3.40, SD = .79$).

2.3.2 Risk-taking, gender and AUT creative performance

In order to examine the effect of the experimental conditions (enhanced risk-taking / control) and gender (men / women) on the creativity indices— fluency and originality in the AUT creativity test a multivariate MANOVA (2X2) analysis was conducted, while "income" score served as a covariate.

The results of the analysis revealed a **significant interaction of Gender x Experiment Conditions** in both measures: $F(2,153) = 3.93, p = .022, \text{partial } \eta^2 = .05$. To examine the source of the interaction, Bonferroni post-hoc analyses was performed which showed that fluency scores were higher for women under increased risk-taking manipulation ($m = 5.85$) compared to the control group ($m = 5.34$), while the reversed results were found for men (mean fluency under increased risk taking was 5.0 compared to 5.94 under control conditions, all differences are significant with $p < .05$, see figure 4).

However, for the AUT originality measure no significant effect was found for gender and experimental group separately, nor a significant main effect. (all p 's > 0.05).

The results indicate that women's performance improved while men's performance was impaired.

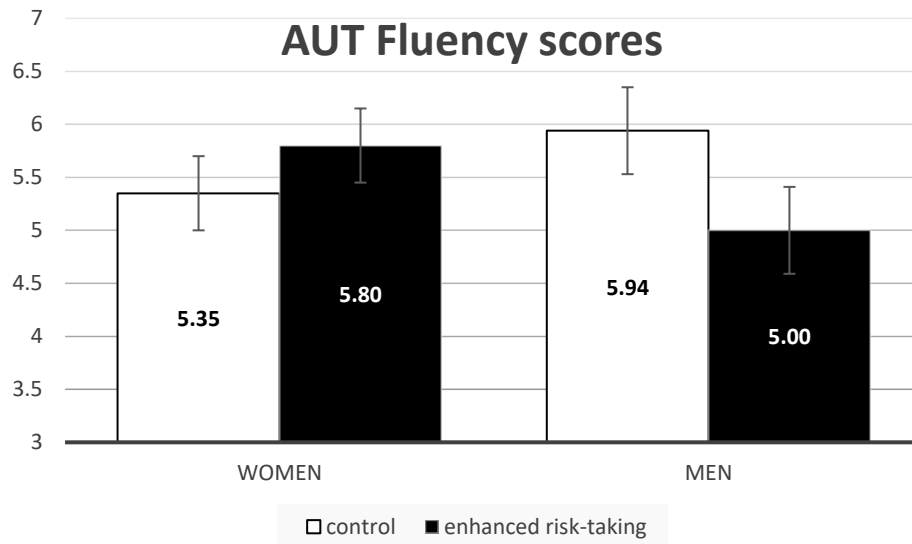


Fig.5. Mean creativity test scores and standard errors in the AUT fluency index in men and women in the different experimental conditions— with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.

2.3.3 Risk-taking, gender and the Creative Foraging Game performance

The CFG generates many creativity measures but in this study, there was a focused on three: number of generated shapes as a fluency measure, general originality (average originality score for all shapes), and Time taken (average seconds taken to create the shapes) as a general performance index.

To examine the effect of the experimental conditions (enhanced risk-taking / control) and gender (men / women) on the various creativity measures of the CFG a second multivariate MANOVA (2X2) analysis was conducted, while "income" score served as a covariate. Similar to the trend observed in the AUT test, also in the CFG test an increase was observed in the fluency index as a result of the manipulation, though not significant. Contrary to the results in the AUT, the increase appears to occur in both women and men as shown in Figure 5.

CFG fluency scores

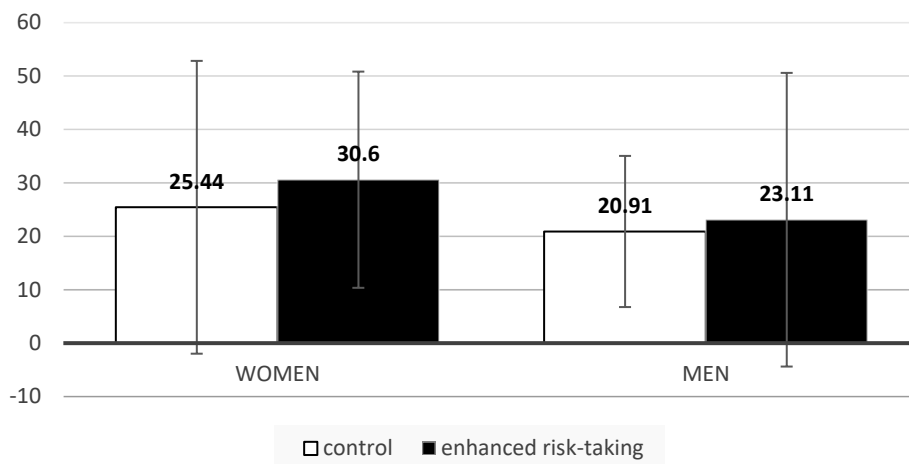


Fig.6. Mean creativity test scores and standard errors in the AUT fluency index in men and women in the different experimental conditions— with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.

The analyses also showed a **near-significant trend of the interaction between risk-taking manipulation and gender regarding the dependent measure of RT (time taken to create the shapes)** ($F(1,64)=3.45$, $p=0.068$, $\eta^2 = .051$). It seems that the average time it took for women to create shapes in the experimental group primed to take more risks, was shorter ($M=14.41$, $SD=10.21$) than in the control group ($M=27.84$, $SD=25.4$). In men, however, no such time difference was observed between the experimental group ($M=20.6$, $SD=13.65$) and the control group ($M=19.19$, $SD=10.11$) as demonstrated in figure 6.

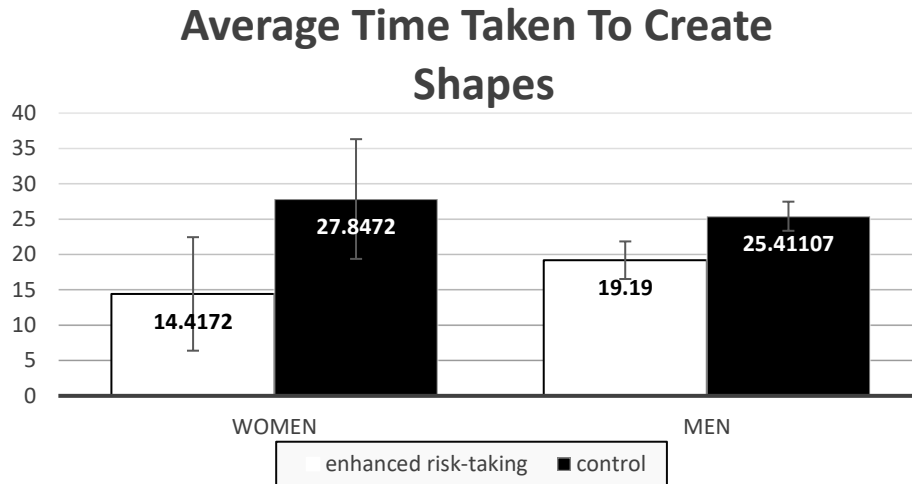


Fig.7. Average time taken to create shapes in the CFG in men and women in the different experimental conditions— with enhanced risk-taking and in the control group. The presented means reflect also the effect of "income" as a covariate.

2.4 Discussion

The current study examined whether encouraging the tendency to take risks would affect the creative performance of men and women in the classic and familiar Alternative Uses Test, the AUT (Guilford et al., 1978) and the non-verbal innovative Creative Foraging Game. A priming task was used to enhance the tendency to take risks, after which the participants performed a creative test. The results showed that women's fluency scores improved to some extent after the manipulation in both tests, though in the CFG it was only a trend. In addition, the manipulation appeared to have shortened women's average time to create shapes on the CFG test. In men, on the other hand, a decrease in creative performance was observed in the fluency measure of the AUT test, and no change in the other indices was observed in the two tests. In addition, originality scores did not change significantly as a result of the manipulation in both tests for men and women.

The results strengthen Tyagi and his colleagues' argument regarding the complexity of the relationship between risk-taking and creativity, which depends on both the risk-taking indices and the creativity indices (Tyagi et al., 2017). In our study, the results are also inconsistent and depend on the type of creativity test and even on the specific index in the test. Our findings indicate a significant association between creativity and

risk-taking that apparently looks different for men and women and varies with respect to the creativity test and its different measures.

The results indicate that there was an improvement in women's performance as a result of the manipulation that manifested itself in producing more ideas in the AUT and in shortening the average time to create shapes in the CFG. However, the manipulation did not seem to have affected the degree of originality of the creative products. It is possible that the manipulation made women less likely to filter their ideas in the first stage of the creative process-the ideas production stage, and as a result the process was streamlined in the CFG and reflected real improvement in the fluency measure at the AUT. However, the manipulation seems to have had less of an impact on the second stage of the creative process- the idea evaluation stage, as originality scores has not changed. However, it can be argued that if women's screening process in the idea production stage was affected by the manipulation in such a way that they spent less time filtering ideas, then they may have performed less 'innovation avoidance' even if it did not result in higher originality of the products in the second stage of the creative process, a hypothesis that can be examined in future research.

As for the creativity fluency scores of men who have decreased as a result of the risk-taking manipulation in the AUT, there may be few explanations. First, the verbal priming (the task that encouraged risk taking) matched the verbal creativity task, thus making it less suitable for men and particularly suitable for women, having a well-documented advantage in verbal fluency (Burton et al., 2005; Halpern, 2000; Hyde & Linn, 1988; Kimura, 2000). Second, beyond the gender difference associated with verbal fluency described above, it is possible that the decline in men's fluency performance was a result of the priming task itself, that is based on the principle of ego depletion (Gino et al., 2007). Past studies have found a link between a difficult or impossible task, such as the one used in the priming task, and a decrease in cognitive performance such as assembling puzzles (Hennessy & Jakubowski, 2008). Perhaps for men, the frustration from the task outweighed the tendency to take risks when they approached the creativity test and combined with the gender differences in verbal abilities lead to the impaired performance. In the CFG, however, male performance was not impaired. Part of the explanation may lie in the fact that the CFG is not verbal and therefore the priming task had less of an effect on it.

2.4.1 Limitations

As with any experimental study, this study also has limitations. First, being an online study in which the recruitment of the subjects and the actual conduct of the research is done online makes it difficult to identify and filter the subjects and monitor their performance. However, online performance made the study completely anonymous and reduced the effects of laboratory performance, and a statistical analysis was performed to verify that the relevant variables were normally distributed. Second, in the present study, which is primarily an exploratory study, a choice was made to examine the effect of increased risk-taking on creativity as measured by creativity tests in a standard laboratory experiment. However, gender differences are mostly present in practice, therefore, in a future study we will examine the impact of risk-taking manipulations in a more practical and field-connected way. Finally, our hypothesis was that the manipulation would mainly affect the second stage of the creative process, the stage of evaluating ideas, which would be expressed in higher scores of originality of women in particular. It seems that the manipulation actually affected the first stage of the creative process.. In light of these findings, there is reason to assume that the manipulation to encourage risk-taking was not effective enough within the framework of the research to increase creativity and it is worth considering using other manipulations.

2.4.2 Conclusion

creativity and innovation are qualities that are very valuable in our generation. Creative processes often require risk-taking that entails the possibility of daring, and often making mistakes, in order to invent and create knowledge (Freire, 1970). Most studies on gender differences and creativity hold that although the creative potential of men and women is the same, gender differences can be seen in the creative achievements of women and men, for the benefit of men (Baer, 1998; Baer 1999). This gap is explained, among other things, by the gender differences associated with risk-taking (Jin et al., 2017). The reality is that men and women differ in their ability to dare and take risks, which may affect women's ability to present and fulfill their creative ideas (Jin et al., 2017).

The current study's findings suggest that there is a way to contribute to women's creative performance by encouraging their tendency to take risks, but at the moment, the path is not entirely clear and requires further exploration. Furthermore, attempting to encourage creativity by increasing the tendency to take risks may be complex given its asymmetrical impact on women and men, as it may contribute to women and at the same time harm men, as found in the present study. Finally, the complicated results, which presented different findings in each creativity test, call for further exploration of the relationship between gender, risk-taking and creativity using different types of priming tasks, different types of risk-taking tests and different types of creativity tests in order to maximize the creative achievements of individuals and ultimately of society as a whole.

Chapter 3: When stereotypes do not predict discrimination: An integrated research paradigm for gender bias assessment of entrepreneurs and technological ventures

Overview

Women are a minority in the entrepreneurial community in Israel and around the world. There are many reasons for this gender gap, including educational and social factors that affect women's motivation to enter the field of entrepreneurship and their chances of thriving in it. One of the factors that makes it difficult for women to succeed as entrepreneurs is related to the fact that various sources of funding tend to discriminate against them and prefer to fund ventures led by men. The literature on the subject points to stereotypical thinking as a source of discrimination but there are a minority of studies that examine stereotypical thinking and discrimination in the same study, making it difficult to demonstrate the relationship between stereotypical thinking and discrimination. The current study suggested an integrated research paradigm that includes two stages, one for examining stereotypical thinking and the other for examining gender bias in project evaluations. The study aimed to examine the relationship between stereotypical thinking towards an "ideal entrepreneur" and gender bias in a venture evaluation process. The results show an interesting picture in which all study participants chose a majority of masculine traits to describe the ideal entrepreneur, yet no bias towards women was observed. In addition, no relationship was found between a tendency to stereotypical thinking and discrimination at the project evaluation stage. The explanations and implications are discussed.

3.1 introduction

Technological ventures led by women are a minority in Israel as in many Western countries (Israel Innovation Authority report, 2019). It seems that women face unique challenges that make it difficult for them to enter the field of entrepreneurship and thrive as entrepreneurs. These challenges are complex and include low motivation to enter the field of entrepreneurship (Chen et al., 2021; Kourilsky & Walstad, 1998;

Marlino & Wilson, 2003), less capital required to set up a venture (Carter *et al.*, 2007; Jennings & Brush, 2013; Marlow & Patton, 2005; Orser *et al.*, 2006) and biases in the process of raising capital by banks (Constantinidis *et al.*, 2006) and venture capital funds (Guzman & Kacperczyk, 2019; Malmström *et al.*, 2017).

Studies focusing on the barriers inherent in the capital-raising process try to locate biases by focusing on one of two perspectives- one perspective examines stereotypical thinking towards entrepreneurs and focuses on the gendered perception of traits and characteristics of the ideal entrepreneur. The second perspective examines discriminatory behavior toward ventures led by men and women, which means examining whether the evaluation of the project remains the same or varies according to the gender of the entrepreneur that is implied in the description and/or presentation of the project in writing or orally.

It seems that the division into two types of research does not allow for a coherent and complete understanding of the relationship between entrepreneurship and gender, and produces unexplained gaps in the results of studies from different perspectives. The present study sought to address this methodological and conceptual gap and examine stereotypical thinking and discrimination in an integrated paradigm to understand the nature of the relationship between stereotypes and discrimination in the context of entrepreneurship and gender.

3.1.1 Venture vs entrepreneur evaluation

Studies focusing on the barriers inherent in the capital-raising process often attempt to locate and predict potential investor biases, with the literature suggesting that the evaluation process of early-stage ventures is a fertile ground for biases of various kinds as a process based on ambiguity and uncertainty (Baron, 2008; Kickul *et al.*, 2009; McMullen & Shepherd, 2006; Smith *et al.*, 2009). In early-stage ventures' evaluation

process, there is an absence of concrete performance metrics, which led prior research to propose that investors rely on their “gut-feel”, which includes the investor’s perception of the entrepreneur (Huang, 2018). Hence, the evaluation process may lead to perceptual stereotypes that may result in a greater bias towards women. For example, in a study by Kanze et al. (2018) it was found that investors ask male and female entrepreneurs different questions. The men are asked "promotion-focused questions", questions about how they will promote their ventures, while the women are asked "prevention-focused questions", questions about how they will face challenges. The implications of men and women being asked different questions is that men receive more funding from investors compared to women. Interestingly, when women answer "prevention-focused" questions in "promotion-focused" answers investors are more likely to finance their ventures (Kanze et al., 2018). In addition, later stages ventures have accumulated track record and financial information, which potentially lead to less bias.

As mentioned, studies in the field examine potential biases from two perspectives - one examines bias towards male or female entrepreneurs and the other examines bias towards enterprises led by men or women. The picture that emerges from these studies is not unequivocal. It seems that in studies focusing on entrepreneurial traits and characteristics, there is no doubt that there is a bias. In all studies, the ideal entrepreneurial figure appears to include traits that are primarily “masculine” (Gupta *et al.*, 2009; Laguía *et al.*, 2019; Meyer *et al.*, 2017).

However, in studies that examined bias toward the venture itself, no bias was found in favor of men. In fact, some of them even found bias in favor of women, as, for example, in the US-based study of Gornall and Strebulaev (2020). In this study, about 28,000 venture capital funds and potential investors were sent an email with a description of a

venture and a contact request, some received the description of the ventures signed with a woman's name and some received the same ventures signed with a man's name. The researchers examined how many of the responses were received in response to female entrepreneurs and how many in response to male entrepreneurs. Surprisingly, the number of responses to projects presented as led by women entrepreneurs was 9% higher than the responses received to projects presented as led by men entrepreneurs, (Gornall & Strebulaev, 2020).

In contrast, similar studies tended to show bias and discrimination against women, as found for example by Balachandra et al., (2019) who suggested a particularly complex phenomenon in which male entrepreneurs and women entrepreneurs, both will be discriminated against by investors if they exhibit "feminine" behavior, but that women will be discriminated against even if they exhibit "masculine" traits. A phenomenon they explain using 'gender role congruity theory' (Eagly & Carli, 2003; Eagly & Karau, 2002; Koenig *et al.*, 2011).

3.1.2 'Gender role congruity theory' and entrepreneurship

Raising capital from venture capital funds (VC) is an extremely important step in establishing start-up companies (Davila *et al.*, 2003; Gompers and Lerner, 2004). Unfortunately, venture capital funds generally prefer funding men-led companies (Balachandra *et al.*, 2019). In the U.S., for example, a study examining more than 6,000 investments found that only 3% of them were directed to women-led companies (Brush *et al.*, 2018). In an attempt to find out the reasons why women receive less funding than men, many studies have found evidence of bias against women (Butter & Rosen, 1989; Marlow & Patton, 2005) as well as funding gaps in favor of men (Brush *et al.*, 2018; Greene *et al.*, 2001; Jennings & Brush, 2013). Theoretical explanations from the fields

of sociology, social psychology, and gender have been used to address and explain the phenomenon of prioritizing men over women in projects funding.

One of the leading theories is the theory developed by Eagly and Karau (2002): "role congruity theory of prejudice toward female leaders". This theory rests on the premise that a group will be positively valued when its characteristics are recognized as appropriate to the typical social roles of that group (Eagly & Diekmann, 2005). In the gender context, Eagly and Kar (2002) argue that in Western society, expectations for different behavior of men and women structure stereotypical perceptions as a result of which gender-appropriate behaviors are perceived as more acceptable than gender-incompatible behaviors. Thus, women in leadership roles are less accepted and even encounter prejudices because there is a mismatch between their gender role as women and the characteristics related to the female gender stereotype and the managerial role that includes "masculine" stereotypical characteristics related to leadership. The consequences are that women will be perceived as less suitable for leadership positions, and that even if they exhibit typical "leadership" behavior, it will be less valued than if presented by a man.

The concept of "think manager - thinking male" (Schein *et al.*, 1996), is also valid when it comes to entrepreneurship because of the social constructions of stereotypes. It seems that in most cases "think entrepreneur" means "think male" as suggested by Meyer *et al.*, (2017). In other words, entrepreneurship is considered a "masculine" profession, and therefore a mismatch between expectations of "masculine" behavior and the reality of "feminine" behavior may lead to a negative assessment of the entrepreneur (Balachandra *et al.*, 2019).

3.1.3 The stereotype index

When dealing with characteristic or stereotypical traits of women and men, one of the traditional divisions is to “communal” traits and “agentic” traits drawn from Bakan’s (1966) work. Bakan referred to the division of traits as something very basic in human behavior and even linked the division to gender. The division is very common in the literature dealing with stereotypes when "communal" traits include: affection, tendency to help, kindness, sensitivity, and gentleness are usually associated with women, while "agentic" traits, which are associated with men, usually include traits such as: aggressiveness, ambition, dominance, self-confidence, independence, and individualism (Eagly & Johannesen-Schmidt, 2001; Embry *et al.*, 2008; Heilman & Okimoto, 2008; Phelan *et al.*, 2008).

In the current study, based on the division into "communal" and "agency" traits, we used characteristic traits to examine the tendency to select "masculine" and "feminine" traits as characterizing the "ideal entrepreneur." Also, based on the data collected in the sample, we created a relative measure that quantifies the relative extent to which each subject tended to choose masculine traits relative to the other subjects. We called the index a "stereotype index" and used it to test the relationship between the two parts of the experiment - the part that examines bias toward ventures with respect to the gender of the entrepreneur presented in the venture description, and the part of the "ideal entrepreneur" assessment. Our hypothesis was that a positive relationship would be found between positive evaluation of ventures presented as men-led and a tendency to evaluate the "ideal entrepreneur" as having a majority of "masculine" qualities.

3.1.4 Evaluator's gender

Although the literature often shows that men and women are both affected by the stereotypical division when it comes to evaluating traits of a manager or entrepreneur

(Gupta *et al.*, 2014; Laguía *et al.*, 2019), other studies have found differences in the tendency for stereotypical bias in judgment in men and women, for example see Berkery, Morley and Tiernan (2013). In their study that examined stereotypes related to gender roles and management positions, they asked subjects to describe a woman, man, or manager by a rating of 92 traits that included communal and agentic traits. Their findings show that men and women responders differed in their assessments. Men tended to have a stereotypical assessment and there was a significant correlation between their assessment of "man" and "manager". Women, on the other hand, did not exhibit a stereotypical assessment, except in the case where they had no employment experience of any kind (Berkery *et al.*, 2013). It is also interesting to note, in the specific context of venture capital and entrepreneurship funds, a study by Ewens and Townsend (2020) who found that male investors expressed more interest in men-led ventures compared to women investors who expressed more interest in women-led ventures (Ewens & Townsend, 2020). These findings suggest that the evaluator's gender is certainly an interesting and important variable for discussion, especially given that in most cases, venture capital funds consist of an overwhelming majority of men (Brush *et al.*, 2018; Gornall & Strebulaev, 2020).

3.1.5 Research overview

The current study contributes to the literature in the fields of entrepreneurship and gender in several ways: first, methodologically, to create a dual research paradigm that includes an examination of entrepreneurial characteristics and projects evaluation in the same sample while focusing on technological ventures only and without attempting to create proactive stereotypical thinking. The very few studies that combine these perspectives of entrepreneurial characteristics and projects evaluation tended to

encourage stereotypical thinking and divide the ventures into ventures with "feminine" and "masculine" characteristics (see Gupta & Turban (2012), for example). Specifically, we aimed to analyze an evaluation of enterprises by gender of the entrepreneur while emphasizing the gender of the evaluator, and then, in the same sample, to examine a general assessment of the characteristics of the "ideal entrepreneur". In addition, the present study sought to examine the relationship between the two parts by using data collected from the characteristics evaluation part to create a relative index of stereotypes (in the study called the 'stereotype index') and using the 'stereotype index' in the statistical analysis of venture evaluation. In doing so, the study sought to create a more complete and coherent understanding of the somewhat contradictory findings in the literature, in addition to creating a basis for further integrated studies, ultimately to contribute to the optimal integration of women in the field of entrepreneurship by monitoring the screening process and the potential biases that exist in it.

In the current online study participants were first required to evaluate five real technological ventures that were presented in one of the venture competitions in Israel in 2018, and then select 5 characteristics out of 18 that they considered "most suitable for leading an entrepreneurial project." In the first part of the project evaluation, we changed the names of the entrepreneurs so that each participant alternately saw the projects as led by a man/woman and we divided the sample so that half saw the same projects as led by women and the other half by men.

The research hypotheses were complex according to the mixed findings reported so far in the literature:

Hypothesis 1. In the venture evaluation part, we hypothesized that no difference would be found in the venture evaluation if they were presented as led by men or women.

Hypothesis 2. However, we hypothesized that women would tend to value more women-led ventures, and men would value more men-led ventures.

Hypothesis 3. In the Ideal Entrepreneur Characteristics Evaluation part, we hypothesized that most participants would choose a majority of “masculine” traits.

Hypothesis 4. In an analysis that combines the "stereotype index", we hypothesized that a positive relationship would be found between the assessment of the ideal entrepreneur as having "masculine" characteristics and a positive evaluation of men-led projects, and vice versa, a positive relationship would be found between the assessment of the ideal entrepreneur as having "feminine" characteristics and a positive evaluation of women-led ventures. In other words, we predicted a linear association between implicit attitude and behavior.

3.2 Method

3.2.1 Participants

Two hundred and sixty-two people participated in the study, between the ages of 18-57 with an average age of 26. Thirty-nine participants were removed from the analyses as they did not complete all parts of the study. The final analysis included 223 participants, 106 women of average age 24, and 117 men of average age 27. All participants were students or graduates of degrees in engineering, business, economics, psychology, brain science or computer science.

3.2.2 Measures

Ventures Evaluation Questionnaire

A simple four-item questionnaire that includes three parameters that are widely used in evaluating ventures tools described in the literature: *innovation* (Lovelace *et al.*, 2001), *applicability* (Gupta *et al.*, 2014) and *willing to invest* (Ciuchta *et al.*, 2018). Since the

current study is part of a larger creativity research project from our lab (see for example Pick & Lavidor, 2019), we added one question for measuring creativity. In addition, the word innovation is not prevalent among Hebrew speakers who are unfamiliar with the professional language associated with entrepreneurship (Wolf, 2019).

The questionnaire consists of short descriptions of five (real) Israeli entrepreneurial projects and evaluation questions for each project. Subjects were asked to rate on a 1-5 Likert scale each venture on the 4 parameters mentioned: innovation, creativity, applicability (the extent to which the venture is implementable) and investment (the extent to which they were willing to invest in the venture). In general, the higher the score, the more positive the subjects' assessment of the project. Two versions of the questionnaire were constructed and describe identical projects. The difference between the versions is expressed in the order in which the gender of the lead entrepreneur is presented (as implied by the entrepreneur's name). The names of the entrepreneurs change alternately, once a female's name and once a male's name. This manipulation enabled the presentation of all the projects once as created by a male entrepreneur and once by a female, across all subjects in a between-subjects manipulation.

The evaluated projects

The subjects were presented with 5 projects: Fly.AI, Khealth, spacepharma, Unbotify, and SecuredTouch. Table 4 below presents a short description of the projects.

Manipulation check

The participants were asked after evaluating the projects whether they had noticed the gender of the entrepreneur and whether the entrepreneur in the last project was a man or a woman. It seems that although most participants (67%) reported not noticing the gender of the entrepreneur when asked directly, most of them correctly guessed the gender of the entrepreneur who was last introduced, as tested by a chi-square test, with

H₀ assuming equal chance for both genders to be selected and the null hypothesis was rejected ($X^2(1)=4.561$, $p<0.03$). The implicit measure of a biased gender we found reflected that subjects were aware, or at least processed the entrepreneur's gender when evaluating the projects.

Table 4. Venture's description

project	Description
Fly.AI	Provides technology for various and diverse shopping sites, which allows for a shared online shopping experience with friends and family, as in a mall.
K Health	Compares users' reports of their health status with medical diagnoses made of patients who have reported similar symptoms and have similar characteristics to theirs - age, sex, medical history, habits, and medication consumption
Space Pharma	The company has developed a tiny lab as big as a shoebox, which is launched into space and allows four experiments to be run simultaneously in the current version, and 360 experiments in the next version.
Unbotify	The company has developed technology based on biometric behavior and artificial intelligence that is able to detect and filter bots on the web, with a high level of accuracy and is able to detect the biometric differences in the online activity of bots and humans.
SecuredTouch	Algorithms that analyze the physical interaction of users with the mobile / computer when using financial and commercial applications for the purpose of user identification and fraud prevention.

"Entrepreneurial" traits selection task

In this task, subjects were asked to select 5 out of 18 traits that in their opinion are “the most important for leading an entrepreneurial project”. The traits included 9 traits that are considered "feminine" and 9 traits that are considered "masculine" (Eagly and Sczesny, 2009; Rice and Barth, 2016; the task is presented in Appendix 3).

3.2.3 Procedure

Participants were recruited through social media posts that called for participation in an online experiment about entrepreneurship for a fee. They filled out a short demographic questionnaire and then they filled out the "venture evaluation questionnaire". Participants were randomly divided into two groups with each group seeing the five ventures in the same order, but with the entrepreneur's name changing, once the name of a man and once the name of a woman alternately. Group 0 saw the entrepreneurs in the order: woman, man, woman, man, woman, and group 1 saw the entrepreneurs in reverse order: man, woman, man, woman, man. After fulfilling their assessment of the ventures on four parameters - innovation, creativity, applicability and investment, the participants moved on to the second part of the study where they were required to select 5 traits that they believe are "most important for leading an entrepreneurial project".

3.3 Results

The study has a between-subjects design in a 2X2 structure with the independent variables being the **experimental conditions and gender of the subjects**. One hundred and seventeen subjects were randomly assigned to Experiment Conditions 0, and 106 to Experiment Conditions 1 as detailed in Table 5. The dependent variables were

innovation, creativity, applicability, and investment scores. Gender distribution and mean age did not differ between the two experimental groups.

Table 5. Gender distribution and mean age in the experimental conditions

variable		Group 0 (N=117)	Group 1 (N=106)	participants (N=223)
gender	women	57(54%)	49(46%)	106
	men	60 (49%)	57(51%)	117
Mean age	women	24	25	24
	men	27	27	27

In the second part of the study, for each subject a score was calculated that represented the number of “masculine” traits they chose (out of the five they were asked to choose) relative to the rest of the subjects. We termed that score "The Stereotype Index", since the presented traits have been previously categorized as masculine or feminine (see Eagly and Sczesny, 2009; Rice and Barth, 2016) therefore the proportion of preferring masculine or feminine traits in entrepreneurship reflects gender-related stereotypes.

3.3.1 The effect of entrepreneurs’ gender (the experimental manipulation) and participants’ gender on project evaluation

In order to examine the impact of the (presented) entrepreneur's gender and the evaluator's gender on the project's evaluation parameters - innovation, creativity, applicability and investment, we conducted a Multivariate MANOVA of gender and experimental group (the entrepreneur's gender manipulation) as between subject’s factors, evaluating their effects on the project scores. To monitor the effect of the

subjects' stereotypical tendencies on the analysis, we inserted "stereotype index" generated from the task of selecting the entrepreneurial traits as a covariate.

The results of the analysis showed a significant between-subject effect of **gender**: ($F(5,214) = 2.60, p = .026, \text{partial } \eta^2 = .05$). Univariate effects showed that women appeared to have given a higher rating than men in four out of five projects, though only in one of them the difference is significant: FlyAI ($F(1,218)=6.96, p=.009, \text{partial } \eta^2 =.03$). Averages scores and standard deviations are listed in table 6.

No significant effects were found for the entrepreneur's gender manipulation (all $p's > .05$). This means that **Hypothesis 1 was accepted, and Hypothesis 2 was rejected**. tables 6 and 7 presents projects evaluation mean by subject's gender and entrepreneur's gender.

Table 6. Means for subject's evaluation of entrepreneurial projects

Venture	subject's gender	M	SD
FlyAI	Female	3.28	.65
	male	3.05	.61
Khealth	Female	3.64	.69
	male	3.53	.67
SpacePharma	Female	3.69	.60
	male	3.53	.73
Unbotify	Female	3.52	.67
	male	3.38	.82
SecuredTouch	Female	3.50	.71
	male	3.53	.74

Table 7. Means for entrepreneurial projects according to entrepreneur's gender

Venture	Entrepreneur's gender	M	SD
FlyAI	Female	3.21	.70
	male	3.12	.60
Khealth	Female	3.62	.73
	male	3.54	.62
SpacePharma	Female	3.61	.63
	male	3.60	.63
Unbotify	Female	3.51	.75
	male	3.40	.77
SecuredTouch	Female	3.50	.72
	male	3.53	.73

3.3.2 Entrepreneurial gender-related characteristics

The frequency of the selected traits in the "Entrepreneurial characteristics selection task" were calculated and are plotted in Figure 7, aiming to examine whether "masculine" traits were selected more often than "feminine" traits to describe ideal entrepreneurs.

According to the data collected, more than a third of the sample, about 36% chose 5 traits that are all "masculine". Another about 40% chose 4 "masculine" traits and one "feminine" trait. 15.7% of the sample chose 3 "masculine" and only 12.1% chose a majority of "feminine" traits. This means that **most of the subjects, men and women alike, who make up 91% of the sample, chose a majority of stereotypical**

“masculine” traits. These distributions were tested by a chi-square test, with H_0 assuming equal chance for all characteristics to be selected as one of the 5 entrepreneur characteristics, and the null hypothesis was rejected ($X^2(4)=132.85, p<0.001$), meaning that all subjects significantly preferred “male” characteristics to describe the ideal entrepreneur. **These results confirm Hypothesis 3.**

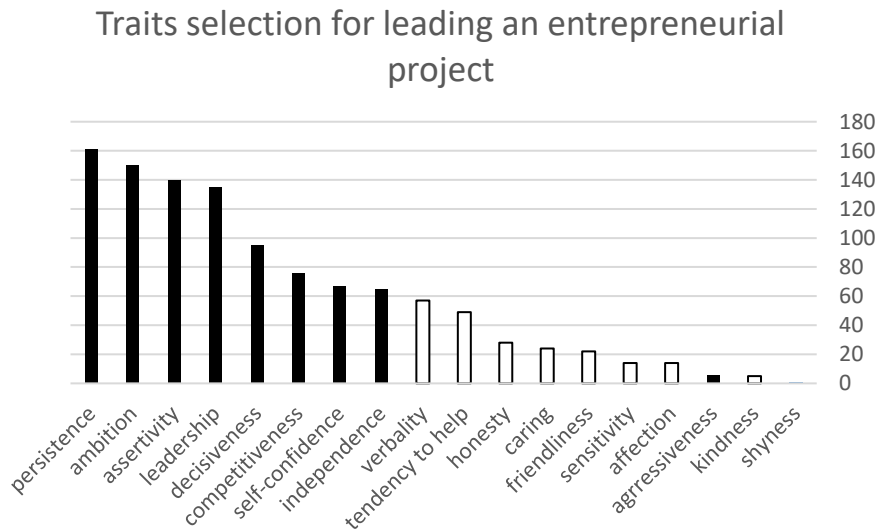


Figure 8. Entrepreneurial characteristics selection

In order to examine differences in the tendency to prefer "masculine" traits for entrepreneurs between women and men, an independent sample T-test was performed on of the variable "stereotype index". This comparison yielded no significant difference in the tendency of men and women to choose a majority of "masculine" traits ($T(221) = .12, p = .90$), with 93% of women selecting mostly masculine traits, and 89% of men.

3.3.3 The relationship between stereotypical thinking and gender bias in project evaluation

In an analysis that combines the "stereotype index", we hypothesized that a positive relationship would be found between the assessment of the ideal entrepreneur as having "masculine" characteristics and a positive evaluation of men-led projects, and vice

versa, a positive relationship would be found between the assessment of the ideal entrepreneur as having "feminine" characteristics and a positive evaluation of women-led ventures. In other words, we predicted a linear association between implicit attitude and behavior. A correlation analysis did not find a significant relationship between the stereotype index and the rating of the various enterprises, which means that **Hypothesis 4 was rejected.**

3.4 Discussion

The current study sought to examine potential gender biases in the evaluation process of enterprises and entrepreneurs using a two-part research paradigm. In the first part, the participants were asked to evaluate 5 ventures on four parameters that are common in the field - innovation, creativity, application, and investment (to what extent they would invest in the project). The ventures were presented to the participants as led by a man or woman alternately, so that each group of participants saw the same projects presented as led by male/female. In the second part, all participants were asked to choose 5 traits that they considered to be "most suitable for leading an entrepreneurial project", out of 18 traits, 9 of which are considered "masculine" and 9 "feminine". We calculated for all participants the extent to which they tended to select "masculine" traits relative to the other study participants and called this variable the "stereotype index" as it reflected how likely participants were to evaluate an entrepreneur as a man. The results showed that two of our hypotheses were confirmed - first there seemed to be no difference in the evaluation of the projects whether they were presented as led by a man or a woman (H1). Second, the vast majority of the sample chose "masculine" traits to describe the ideal entrepreneur (H3).

However, two of our hypotheses were refuted. Our second hypothesis (H2) that men will value more men-led ventures and women will value more women-led ventures has been refuted since women tended to value most ventures higher compared to men (one of them significantly), regardless of the gender of the entrepreneur presented. Men, on the other hand, did not give a higher rating to men-led ventures.

Regarding the relationship between the evaluation of the characteristics of the "ideal entrepreneur", what we called the "stereotype index", and the evaluation of the ventures (H4), we were surprised to find that the stereotype index was unable to predict enterprise ratings. In fact, as if completely independent, most subjects showed a clear bias in seeing the ideal entrepreneur as having masculine traits and yet, showed no bias in evaluating the projects themselves.

We expected the integrated paradigm to reveal the relationship between the ideal entrepreneur's perception as a man and men's preference in the venture evaluation process, but the fact that no such relationship was found raises a possibility that there is a separation in the subjects' perception between biological sex and traits that characterize biological sex. Hence, participants simultaneously imagine the ideal entrepreneur as having certain traits (usually associated with men), and yet, do not automatically prefer men-led ventures, because the fact that they are men is not automatically linked to "masculine" traits.

These results support the claim found in the study of Balachandra et al. (2019), that investor's bias is not directed towards the gender of the entrepreneur directly but towards the qualities he or she exhibits. Their study found that entrepreneurs, women and men, who exhibited "feminine" traits were discriminated against by investors after an oral presentation of the venture, a finding they explain by the fact that the bias among

investors is in fact towards "femininity" which is perceived as the opposite of being competent, qualified and leading (Balachandra et al., 2019).

Similarly, bias could be observed towards the characteristics of entrepreneurs and not towards entrepreneurs themselves. In addition, in our study, subjects were not given the opportunity to be impressed by the characteristics of the entrepreneurs as the projects were presented in writing and without mentioning of details about the entrepreneurs themselves other than their names.

It is important to note that these findings do not contradict the fact that there is a bias in favor of men and against women in the world of entrepreneurship as we mentioned earlier (Constantinidis *et al.*, 2006; Guzman & Kacperczyk, 2019; Malmström *et al.*, 2017). However, it can be assumed that evaluators might be less subject to the stereotypical influence of gender when ventures are presented in writing, because their impression is limited to the content of the venture and not to the traits and behavioral characteristics of the entrepreneurs. In other words, it is possible that the subjects assumed that all entrepreneurs, both women and men, have the same desirable qualities ,that are often attributed to men, regardless of their biological sex.

As for the findings regarding the tendency of women to rank the ventures higher than men regardless of the gender of the entrepreneur, the high evaluation of ventures can be explained in the theory of Gupta & Turban (2012) who found in their study that women with a tendency to high sexist thinking tended to value "masculine" ventures higher than "feminine" ventures, a finding that they explain by women's tendency to base their assessment of ventures on a stereotypical starting point of "male ventures". Assuming that software-based technology ventures are "masculine" (Gupta & Turban, 2012), there is reason to believe that some women have tended to value them higher for the same reason.

The novelty in the current study was by implying a research paradigm that combined two research types that characterize the literature in the entrepreneurship field - a study that examines biases towards the venture (presenting it as alternately led by a man / woman) and a study that independently examines how participants perceive the ideal entrepreneur as masculine or feminine (without trying to encourage stereotypical thinking and without examining it towards "feminine" and "masculine" ventures). Moreover, in order not to accidentally create stereotypical thinking, all participants were first asked to evaluate the ventures and only then to select characteristics of the "ideal entrepreneur". The integrated paradigm allowed us to examine whether there would be an implicit relationship between the subjects' tendencies to stereotypical assessment of the "ideal entrepreneur" and their actual assessment of the men / women-led projects.

The results of the study showed that the picture is complex and that the stereotype index has no ability to link the different parts (evaluation of enterprises and choice of entrepreneurial characteristics), indicating the possibility that perceptions of male and female entrepreneurs and perceptions of enterprises themselves are separate.

3.4.1 Limitations

As with any empirical study, this study also has limitations. We will first note the fact that this is a small sample and one that does not represent the investor population in Israel and in the world (which usually consists of older men). However, we believe a gender-balanced sample that well represents a young population with relevant education was worth-testing. Such sample allowed us to examine a theoretical assessment of male and female investors (which is difficult to apply in reality, given the limited percentage of women investors), and to examine differences between

assessments of inexperienced young people compared to experienced investors. As mentioned, the sample is limited and can therefore be characterized as initial.

In addition, the study was conducted in two parts in a fixed order, so as not to have an effect of the second part (evaluation of the characteristics of the ideal entrepreneur) on the first part of the ventures' evaluation. This decision to conduct the study in the same order indeed prevented stereotypical evaluation, however, we are unable to calculate task order effects, if any.

3.4.2 Conclusions

The importance of the study is twofold, both in that the study demonstrates a structure that combines the various paradigms that make up most of the studies on the subject, and also as a basis for examining the relationship between gender stereotypes and discrimination, when the relationship is not always clear and linear. The current study emphasizes the importance of planning studies that combine an examination of stereotypical thinking and actual bias as the relationship between them is complex. We have seen that on the one hand most of the sample considers "masculine" traits to be most suitable for leading enterprises; Nevertheless, this perception was not related to a greater appreciation of enterprises led by men. These findings support the assumption that the bias may not be towards men and women but towards "femininity" and "masculinity", towards traits and not towards people and that there is a separation in perception of people and traits in processes of this kind, especially when the subjects are not able to be impressed by behavioral characteristics since the presentation of the venture is done in writing

The study's results and conclusions require further thinking and research to assess with certainty the separation of perceptions towards entrepreneurs and their characteristics,

and to look for a metric that can link stereotypical thinking to behavioral bias. It is also important to understand the practical implications of the study's results. Although it seems that gender bias can be reduced at the initial stage where projects are presented in writing, in the entrepreneurial process there is no escape from presenting the project orally as well. Therefore, it is important to continue to fight stereotypes and biases that still play a significant role in entrepreneurship to allow women and men an equal opportunity to succeed.

General discussion

The status of women in the labor market in Israel indicates inequality and large gaps. Even today in 2022, women earn less (The Van Leer Jerusalem Institute, 2021) and their presence in fields such as technological entrepreneurship and high-tech is significantly smaller than that of men (Israel Innovation Authority, 2019). The reasons for these gender gaps are many and varied and include the fact that women are encouraged to choose care and education roles and are forced to work flexible hours to care for children and older parents (The Van Leer Jerusalem Institute, 2021). In addition, the world of entrepreneurship requires risk-taking, and women are less likely to take risks (Fisk, 2018). Women are also more concerned about social rejection, which makes it difficult for them to function optimally under conditions of judgment and criticism (Jin et al, 2017). In addition, in the field of entrepreneurship, women are discriminated against by investors and banks, and their chances of obtaining funding for an entrepreneurial project are lower than those of men (Constantinidis *et al.*, 2006; Guzman & Kacperczyk, 2019; Malmström *et al.*, 2017). It seems that social influences, barriers, and gender stereotypes simultaneously cause women to avoid entering the high-tech and entrepreneurship industries and cause investors to prefer men.

The current research sought to examine the three specific factors mentioned: judgment, risk-taking, and gender discrimination with an emphasis on creativity. Creativity is a first and necessary step in the entrepreneurial process (Ardichvili et al., 2003; Schumpeter, 1934; Shane & Nicolaou, 2015), it is also an important and desirable feature in the labor market in every field, especially in the fields of innovation and high-tech (Phipps & Prieto, 2015). What is interesting about the subject of creativity is that research in the field indicates that women and men have equal potential on every aspect tested in standard creativity tests (Abraham, 2016), yet there are major gender differences in creative achievements (Hora et al., 2021). Due to the equal starting point in the creative potential, we sought to examine how two of the factors mentioned earlier (risk-taking, sensitivity to judgment) affect creative performance and whether gender differences would be revealed as a result of targeted intervention. The goal was to examine whether these factors contribute to gender gaps in creative performance. In addition, we examined the third factor, gender discrimination by measuring

stereotypical thinking and discriminating against ventures that were presented as being led by men and women alternately.

The three studies were conducted separately, recruiting different samples. The first study examined the concept of judgment. The sample was divided into an experimental and a control group. Both study groups performed the same non-verbal creativity test (the Creative Foraging Game, Hart et al., 2017), but in the experimental group we slightly changed the test instructions. We added a short sentence that told the subjects that the shapes they create in the game would go through a judging process and get a score on how creative they were. We expected that women's tendency to be harmed by judicial processes would adversely affect their performance and that men would not be affected by the manipulation. Contrarily to our hypothesis, we found that men were the ones who were affected by the intervention, a significant *positive* effect that was expressed in higher creativity scores in the experimental compared to the control group. In women, no differences were found.

In the second study we hypothesized that if the starting point is that women are less likely than men to take risks, it is possible that an intervention that encourages the tendency to take risks will increase the chances that women will produce more original products and be more willing to present them. We used the Creative Foraging Game (CFG), and the well-established creativity test named Alternative Uses Test (AUT). Both tests divide the creative process into two stages that can be examined separately. These stages include a stage of generating ideas (indexed by fluency), and a stage of selecting ideas for presentation (indexed by originality). The experimental group performed a task that encourages risk-taking. The results showed that risk-taking had a positive effect on women's creativity scores on the verbal AUT test and a negative effect on men's. In addition, Women who were primed to take risks created products faster than women who were not primed while men's average production time did not differ.. There were no effects of the intervention on the originality index.

In the third study, as mentioned, we focused on the evaluation of enterprises and the factor of gender discrimination. The literature is not unequivocal on the subject, on one hand, women-led ventures do receive less funding from investors and banks (Balachandra *et al.*, 2019; Constantinidis *et al.*, 2006; Guzman & Kacperczyk, 2019;

Malmström *et al.*, 2017). However, some studies have shown that there is no initial preference for male entrepreneurs (Gornall & Strebulaev, 2020). In addition, when examining stereotypical thinking as expressed in the way people imagine the ideal entrepreneur, all studies indicate that the imagined figure is a man (Meyer *et al.*, 2017). We combined the two paradigms that are common in entrepreneurship and gender studies and created a two-stage experimental outline - a phase of project evaluation and a phase of examining entrepreneur's stereotypes.

In the first stage, we presented five real Israeli projects to subjects. The projects were presented to all subjects in an identical way, using the exact same text, except for the gender of the entrepreneur, which was presented alternately once as a woman and once as a man. Subjects were asked to rate the ventures on four parameters - creativity, innovation, applicability, and investment (the extent to which they would have invested in the project). In the second part, we asked the subjects to choose 5 traits that in their eyes are most suitable for the ideal entrepreneur out of 18 traits. The scale of the 18 traits had 9 of which are "feminine" and 9 "masculine" (Eagly & Karau, 2002). The results clearly showed three things. First, the vast majority of the sample, men and women alike, think of the ideal entrepreneur as a man. Second, the vast majority of the sample did not rank higher ventures presented as men-led. Finally, no statistical relationship was found between the tendency to think in a stereotypical way and the tendency to evaluate ventures by gender of the entrepreneur.

The results from all three studies reveal an interesting and complex picture regarding the connection between creativity, entrepreneurship and gender. Despite the complexity of the results, the current study was able to shed light on a number of significant points. The first of these points is the ease with which gender bias has been created in the creativity test. We have seen that wording of instructions indicating the existence of a judging and scoring process tipped the scales for men and in fact created inequality. This raises questions such as: Can other test scores be skewed with similar ease, by slightly changing test instructions? Is this a phenomenon that can explain gender gaps in other areas? We have seen, for example, in a study by Kricheli-Katz and Regev (2021), that the wording of instructions affects the performance of women and men in mathematics tests and can contribute to correcting the gender gap in math performance (Kricheli-Katz & Regev, 2021). Fortunately, this finding has led to a sweeping change

in the test regulations at a number of academic institutions in the country. Assuming that the results from the present study will be replicated in further studies and show that men have an advantage in tasks when they are particularly aware of the judging process, it will be possible to examine how to use this knowledge to contribute to a more egalitarian environment.

Furthermore, another interesting point that the study has taught us is regarding stereotypical attitudes towards ventures and entrepreneurs. The results from our third study showed, on one hand, clear stereotypical thinking, while on the other hand no sign of discrimination based on the same stereotypical thinking. This unexpected picture suggests the possibility that the gender bias observed in reality is a result of a bias toward “femininity” rather than towards women, or rather, towards "feminine" stereotypical traits. Therefore, we did not see a bias as a result of changing the name of the entrepreneur, since in this way, the subjects are not given the opportunity to be impressed by his or her traits. In contrast, the bias is indeed observed when subjects are asked about traits directly.

This assumption about bias toward "femininity" rather than toward women, inevitably holds good and bad news. The good news is that it might be possible to reduce the bias towards "femininity" by presenting projects in writing. The bad news is that until we reduce the bias towards "femininity", we will continue to see bias and discrimination when projects are presented orally (as was reported by Balachandra et al., 2019), and an oral presentation is an inevitable step in the entrepreneurial process.

To conclude, in a sense, findings that suggest gender bias call for action on several levels. The first level is, of course, the immediate correction of the bias. For example by changing the conditions under which a test or an interview takes place. Just as some groups are given special conditions to allow them to fulfil their potential, or as some groups are given preference in employment (see for example Balafoutas & Sutter, 2012; Henningsen et al. 2022), so it should be done if women are found to be disadvantaged due to certain conditions. The second level relates to the circumstances in which the bias was created, to the question of *why* the gaps were created and how they can be prevented. Correcting the bias at this level calls for an understanding of the overt and covert ways in which the bias is created and for preventative action. One of the great challenges in this area is trying to change fundamental ways of thinking that contribute

to the production and preservation of gender stereotypes. Saguy and her colleagues call this type of thinking 'gender ideology' and argue that essential binary thinking that relates biological sex to gender roles paves the way for the creation of an unequal environment (Saguy et al., 2021). Essentialist thinking about gender roles is very common and reflected in a variety of areas of life such as education, culture, politics, etc. Therefore the difficulty in changing gender ideology is great. One way to act in this arena of changing essentialist attitudes toward gender is through scientific research. Studies on gender disparities have a significant contribution to understanding gender inequality in Israel and around the world and help prevent it. The present study sought to look at the significant gender gap in entrepreneurship and examine three potential factors that may contribute to understanding and reducing gender gaps in the field through three research arrays. Each study highlighted a significant point within the overall broad and complex framework of gender gaps in the labor market and thus joined the other important and necessary studies aimed at understanding the complexity of the phenomenon and contributing to change.

The present work offers a broad perspective on the process in which a creative idea becomes a product and is evaluated by judges to become a product or a venture. The work analyzes factors that influence and produce gender gaps in this interesting and important process. Both the creative field and the issue of gender gaps are extremely important in our changing world and therefore the contribution of the research is significant.

However, the brevity of the work allowed us to examine only a few factors out of the dozens and perhaps hundreds of factors that influence the complex issue of creativity and gender and therefore we would like to recommend continuing to investigate the issue from a variety of perspectives and through different research processes and tools. First, we would like to recommend examining how judgment affects gender differences in a variety of areas in addition to creativity. Second, we would like to recommend examining various manipulations to encourage risk-taking and examine in which cases these could help women to dare and present bolder ideas. Finally, we would like to recommend deepening the research on the relationship between gender stereotypes and discrimination in order to reduce them. Thus, to examine what can be useful in reducing the gender bias of investors in the capital raising process as well as how to act in order to reduce the formation of stereotypes in the first place.

References

- Abraham, A. (2016). Gender and creativity: an overview of psychological and neuroscientific literature. *Brain imaging and behavior*, *10*(2), 609-618.
- Acs, Z. J., Audretsch, D. B., Braunerhjelm, P., & Carlsson, B. (2012). Growth and entrepreneurship. *Small Business Economics*, *39*(2), 289-300.
- Amabile, T. M. (2013). Componential theory of creativity. In E. H. Kessler (Ed.), *Encyclopedia of management theory* (pp. 134–139). Thousand Oaks, CA: Sage Publications.
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative science quarterly*, *50*(3), 367-403.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of management journal*, *39*(5), 1154-1184.
- Anderson, L. R., & McLenigan, M. (1987). Sex differences in the relationship between self-monitoring and leader behavior. *Small group behavior*, *18*(2), 147-167.
- Anderson, L. R., & Thacker, J. (1985). Self-monitoring and sex as related to assessment center rating and job performance. *Basic and Applied Social Psychology*, *6*(4), 345-361.
- Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of management*, *40*(5), 1297-1333.
- Aragonés-González, M., Rosser-Limiñana, A., & Gil-González, D. (2020). Coeducation and gender equality in education systems: A scoping review. *Children and Youth Services Review*, *111*, 104837.
- Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. *Journal of Business venturing*, *18*(1), 105-123.

- Aslam, M., Kingdon, G., & Söderbom, M. (2008). Is Female Education a Pathway to Gender Equality in the Labor Market? Some Evidence from Pakistan1. *Girls' Education in the 21st Century*, 67.
- Atkinson, J. W., & Feather, N. T. (Eds.). (1966). *A theory of achievement motivation* (Vol. 66). New York: Wiley.
- Atkinson, J. W., & Raynor, J. O. (1974). *Motivation and achievement*. Winston.
- Audretsch, D. B., & Lehmann, E. E. (2006). Do locational spillovers pay? Empirical evidence from German IPO data. *Economics of Innovation and New Technology*, 15(1), 71-81.
- Baas, M., Koch, S., Nijstad, B. A., & De Dreu, C. K. (2015). Conceiving creativity: The nature and consequences of laypeople's beliefs about the realization of creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 9(3), 340.
- Bacigalupo, M., Kamyliis, P., Punie, Y., & Van den Brande, G. (2016). EntreComp: The entrepreneurship competence framework. *Luxembourg: Publication Office of the European Union*, 10, 593884.
- Baer, J. (1997). Gender differences in the effects of anticipated evaluation on creativity. *Creativity Research Journal*, 10(1), 25-31.
- Baer, J. (1998). Gender Differences in the Effects of Extrinsic Motivation on Creativity. *The Journal of Creative Behavior*, 32(1), 18–37.
- Baer, J. (1999). Gender differences. In M. A. Runco & S. Pritzker (Eds.), *Encyclopedia of creativity*. San Diego: Academic Press.
- Baer, J., & Kaufman, J. C. (2008). Gender Differences in Creativity. *The Journal of Creative Behavior*, 42(2), 75–105.
- Bakan, D. (1966). *The duality of human existence: An essay on psychology and religion*, Rand McNally, Chicago.

- Balachandra, L., Briggs, T., Eddleston, K., & Brush, C. (2019). Don't pitch like a girl!: How gender stereotypes influence investor decisions. *Entrepreneurship Theory and Practice*, Vol. 43 No. 1, pp. 116-137.
- Balafoutas, L., & Sutter, M. (2012). Affirmative action policies promote women and do not harm efficiency in the laboratory. *science*, 335(6068), 579-582.
- Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of management Review*, Vol. 33 No. 2, pp. 328-340.
- Baron, R. A., & Ensley, M. D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management science*, Vol. 52 No. 9, pp. 1331-1344.
- Barron, F. X. (1955). The disposition toward originality. *Journal of Abnormal Social Psychology*, 51, 478-485.
- Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual review of psychology*, 32(1), 439-476.
- Basadur, M. (1995). Optimal ideation-evaluation ratios. *Creativity Research Journal*, 8, 63-75.
- Baptista, R., Escária, V. & Madruga, P. (2008). Entrepreneurship, regional development and job creation: the case of Portugal. *Small Business Economics*, 30(1), 49-58.
- Bear, J. B., Cushenbery, L., London, M., & Sherman, G. D. (2017). Performance feedback, power retention, and the gender gap in leadership. *The Leadership Quarterly*, 28(6), 721-740.
- Berger, A. N., & Udell, G. F. (2003), "Small business and debt finance", Acs Z. J. and Audretsch D. B. (Ed.s) *Handbook of entrepreneurship research*, Springer, Boston, MA, pp. 299-328.
- Berkery, E., Morley, M., & Tiernan, S. (2013). Beyond gender role stereotypes and requisite managerial characteristics. *Gender in Management: An International Journal*, Vol. 28 No.5, pp. 278-298.

Biernat, M., & Kobrynowicz, D. (1997). Gender-and race-based standards of competence: lower minimum standards but higher ability standards for devalued groups. *Journal of personality and social psychology*, Vol. 72 No. 3, p. 544.

Binnewies, C., Ohly, S., & Sonnentag, S. (2007). Taking personal initiative and communicating about ideas: What is important for the creative process and for idea creativity?. *European Journal of Work and Organizational Psychology*, 16(4), 432-455.

Bishop, T. (2017) The Effects of Ego Depletion and Emotional Intelligence on Risk-Taking .*UNF Graduate Theses and Dissertations*. 759.

Bonduelle, S. L. B., Chen, Q., Wu, G. R., Braet, C., De Raedt, R., & Baeken, C. (2021). Exposure to criticism modulates left but not right amygdala functional connectivity in healthy adolescents: individual influences of perceived and self-criticism. *Frontiers in psychiatry*, 12, 1097.

Bönte, W., & Jarosch, M. (2012). Gender differences in competitiveness, risk tolerance, and other personality traits: Do they contribute to the gender gap in entrepreneurship? *Schumpeter Discussion Papers 2011-2012*, Schumpeter School of Business and Economics, University of Wuppertal, Gaußstraße. 20, 42119 Wuppertal, Germany, 1-42.

Brown, R. M., Hall, L. R., Holtzer, R., Brown, S. L., & Brown, N. L. (1997). Gender and video game performance. *Sex Roles*, 36(11), 793-812.

Brush, C., Greene, P., Balachandra, L., & Davis, A. (2018). The gender gap in venture capital-progress, problems, and perspectives. *Venture Capital*, Vol. 20 No. 2, pp. 115-136.

Burton, L. A., Henninger, D., & Hafetz, J. (2005). Gender differences in relations of mental rotation, verbal fluency, and SAT scores to finger length ratios as hormonal indexes. *Developmental neuropsychology*, 28(1), 493-505.

Buttner, E. H., & Rosen, B. (1989). Funding new business ventures: Are decision makers biased against women entrepreneurs?. *Journal of Business Venturing*, Vol. 4 No. 4, pp. 249-261.

- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: a meta-analysis. *Psychological bulletin*, 125(3), 367.
- Caligiuri, P. M., & Day, D. V. (2000). Effects of self-monitoring on technical, contextual, and assignment-specific performance: A study of cross-national work performance ratings. *Group & Organization Management*, 25(2), 154-174.
- Campbell, D. T. (1960). Blind variation and selective retentions in creative thought as in other knowledge processes. *Psychological review*, 67(6), 380.
- Caniëls, M. C., De Stobbeleir, K., & De Clippeleer, I. (2014). The antecedents of creativity revisited: A process perspective. *Creativity and Innovation Management*, 23(2), 96-110.
- Carter, S., Shaw, E., Lam, W., & Wilson, F. (2007). Gender, entrepreneurship, and bank lending: The criteria and processes used by bank loan officers in assessing applications. *Entrepreneurship theory and practice*, Vol. 31 No. 3, pp. 427-444.
- Charness, G., & Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, 83(1), 50-58.
- Chavez-Eakle, R. A., Lara, M. D. C., & Cruz-Fuentes, C. (2006). Personality: A possible bridge between creativity and psychopathology?. *Creativity Research Journal*, 18(1), 27-38.
- Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?. *Journal of business venturing*, Vol. 13 No. 4, pp. 295-316.
- Chen, H., Lee, B. H., & Alymkulova, A. (2021). Gender gaps in opportunity-driven entrepreneurship: the impact of human and social capital. *International Journal of Gender and Entrepreneurship*.
- Ciuchta, M. P., Letwin, C., Stevenson, R., McMahon, S., & Huvaj, M. N. (2018). Betting on the coachable entrepreneur: Signaling and social exchange in entrepreneurial pitches. *Entrepreneurship Theory and Practice*, Vol. 42 No .6, pp. 860-885.

Cheung, P. C., & Lau, S. (2010). Gender differences in the creativity of Hong Kong school children: Comparison by using the new electronic Wallach–Kogan creativity tests. *Creativity Research Journal*, 22(2), 194-199.

Cohen, A. K., & Cromwell, J. R. (2021). How to respond to the COVID-19 pandemic with more creativity and innovation. *Population Health Management*, 24(2), 153-155.

Constantinidis, C., Cornet, A., & Asandei, S. (2006). Financing of women-owned ventures: The impact of gender and other owner-and firm-related variables. *Venture capital*, Vol. 8 No. 2, pp.133-157.

Cramer, K. M., & Gruman, J. A. (2002). The Lennox and Wolfe revised self-monitoring scale: Latent structure and gender invariance. *Personality and Individual Differences*, 32(4), 627-637.

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic literature*, 47(2), 448-74.

Csikszentmihalyi, M. (2014). Society, culture, and person: A systems view of creativity. In *The Systems Model of Creativity* (pp. 47-61). Springer, Dordrecht.

d'Acremont, M., & Van der Linden, M. (2006). Gender differences in two decision-making tasks in a community sample of adolescents. *International Journal of Behavioral Development*, 30(4), 352-358.

Dailey, L., & Mumford, M. D. (2006). Evaluative aspects of creative thought: Errors in appraising the implications of new ideas. *Creativity Research Journal*, 18(3), 385-390.

Davila, A., Foster, G., & Gupta, M. (2003). Venture capital financing and the growth of startup firms. *Journal of business venturing*, Vol. 18 No. 6, pp. 689-708.

Day, D. V., Shleicher, D. J., Unckless, A. L., & Hiller, N. J. (2002). Self-monitoring personality at work: a meta-analytic investigation of construct validity. *Journal of Applied Psychology*, 87(2), 390.

De Vet, A. J., & De Dreu, C. K. (2007). The influence of articulation, self-monitoring ability, and sensitivity to others on creativity. *European Journal of Social Psychology*, 37(4), 747-760.

- del Campo, C. (2017). The role of creativity in entrepreneurship: An empirical study on business undergraduates. *Education+ Training*.
- Dewett, T. (2006). Exploring the role of risk in employee creativity. *The Journal of Creative Behavior*, 40(1), 27-45.
- Dewett, T. (2007). Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment. *R&d Management*, 37(3), 197-208.
- DiPrete, T. A., & Jennings, J. L. (2012). Social and behavioral skills and the gender gap in early educational achievement. *Social Science Research*, 41(1), 1-15.
- Dul, J., Ceylan, C., & Jaspers, F. (2011). Knowledge workers' creativity and the role of the physical work environment. *Human resource management*, 50(6), 715-734.
- Eagly, A. H., & Sczesny, S. (2009). "Stereotypes about women, men, and leaders: Have times changed?", Barreto M., Ryan M. K., and Schmitt M. T. (Ed.s), *The glass ceiling in the 21st century: Understanding barriers to gender equality*, American Psychological Association, Washington, DC, pp. 21–47.
- Eagly, A. H., & Steffen, V. J. (1984). Gender stereotypes stem from the distribution of women and men into social roles. *Journal of personality and social psychology*, 46(4), 735.
- Eagly, A. H., & Wood, W. (2012). Social role theory. *Handbook of theories in social psychology*. *Handbook of theories in social psychology*. London: Sage Publications Ltd. (pp 458–476).
- Eagly, A. H., & Carli, L. L. (2003). The female leadership advantage: An evaluation of the evidence. *The leadership quarterly*, Vol. 14 No. 6, pp. 807-834.
- Eagly, A. H., & Johannesen-Schmidt, M. C. (2001). The leadership styles of women and men. *Journal of social issues*, Vol. 57 No. 4, pp. 781-797.
- Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological review*, Vol. 109 No. 3, p. 573.

Eagly, A. H., & Dickman, A. B. (2005). "What is the problem? Prejudice as an attitude-in-context", Dovidio, J.F., Glick, P. and Rudman, L.A. (Ed.s), *On the nature of prejudice: Fifty years after Allport*, , Blackwell ,Oxford, England, pp. 17–35.

Eddleston, K. A., Ladge, J. J., Mitteness, C., & Balachandra, L. (2016). Do you see what I see? Signaling effects of gender and firm characteristics on financing entrepreneurial ventures. *Entrepreneurship Theory and Practice*, Vol. 40 No .3, pp. 489-514.

Eisenman, R. (1987). Creativity, birth order, and risk taking. *Bulletin of the Psychonomic Society*, 25(2), 87-88.

Embry, A., Padgett, M. Y., & Caldwell, C. B. (2008). Can leaders step outside of the gender box? An examination of leadership and gender role stereotypes. *Journal of Leadership and Organizational Studies*, Vol. 15 No. 1, pp. 30-45.

Ewens, M., & Townsend, R. R. (2020). Are early stage investors biased against women?. *Journal of Financial Economics*, Vol. 135 No. 3, pp. 653-677.

Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193-209.

Feist, G. J. (1998). A meta-analysis of personality in scientific and artistic creativity. *Personality and social psychology review*, 2(4), 290-309.

Fischer, P., Kastenmüller, A., & Asal, K. (2012). Ego depletion increases risk-taking. *The Journal of Social Psychology*, 152(5), 623-638.

Fisk, S. R. (2018). Who's on top? Gender differences in risk-taking produce unequal outcomes for high-ability women and men. *Social Psychology Quarterly*, 81(3), 185-206.

Flory, J. A., Leibbrandt, A., & List, J. A. (2015). Do competitive workplaces deter female workers? A large-scale natural field experiment on job entry decisions. *The Review of Economic Studies*, 82(1), 122-155.

Frazier, R. B., & Fatis, M. (1980). Sex differences in self-monitoring. *Psychological Reports*, 47(2), 597-598.

- Freire, P. 1970. *Pedagogy of the oppressed*, New York: Seabury Press.
- Furman, A., Kutsepal, S., Prykhodko, T., Krylova, S., Gliznutsa, M., & Vykhoanets, Z. (2020). Intelligence, Creativity, Psychological and Personal Qualities of Employees As Factors of Real Achievements. *International Journal of Management*, 11(4).
- Gangestad, S. W., & Snyder, M. (2000). Self-monitoring: Appraisal and reappraisal. *Psychological bulletin*, 126(4), 530.
- Garber, J., Goodman, S. H., Brunwasser, S. M., Frankel, S. A., & Herrington, C. G. (2019). The effect of content and tone of maternal evaluative feedback on self-cognitions and affect in young children. *Journal of experimental child psychology*, 182, 151-165.
- Getzels, J.W. & Jackson, P.W. (1962). *Creativity and Intelligence: Explorations with Gifted Students*. John Wiley: New York.
- Gino, F., Schweitzer, M. E., Mead, N. L., & Ariely, D. (2011). Unable to resist temptation: How self-control depletion promotes unethical behavior. *Organizational behavior and human decision processes*, 115(2), 191-203.
- Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *The quarterly journal of economics*, 118(3), 1049-1074.
- Gompers, P. A., & Lerner, J. (2004). *The venture capital cycle*, MIT press, Cambridge, MA.
- Gornall, W., & Strebulaev, I. A. (2020). Gender, race, and entrepreneurship: A randomized field experiment on venture capitalists and angels. Available at SSRN 3301982.
- Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, 28 (3)34.
- Greene, P. G., Brush, C. G., Hart, M. M., & Saporito, P. (2001). Patterns of venture capital funding: is gender a factor?. *Venture Capital: An international journal of entrepreneurial finance*, Vol. 3 No. 1, pp. 63-83.

Gudykunst, W. B., Gao, G., Nishida, T., Bond, M. H., Leung, K., Wang, G., & Barraclough, R. A. (1989). A cross-cultural comparison of self-monitoring. *Communication Research Reports*, 6(1), 7-12.

Guilford, J. P. (1959). Three faces of intellect. *American psychologist*, 14(8), 469.

Guilford, J.P., Christensen, P.R., Merrifield, P.R., & Wilson, R.C. (1978) *Alternate uses: Manual of instructions and interpretation*. Orange, CA: Sheridan Psychological Services.

Gupta, V. K., & Turban, D. B. (2012). Evaluation of new business ideas: do gender stereotypes play a role?. *Journal of Managerial Issues*, Vol. 24 No. 2, pp. 140-156.

Gupta, V. K., Goktan, A. B., & Gunay, G. (2014). Gender differences in evaluation of new business opportunity: A stereotype threat perspective. *Journal of Business Venturing*, Vol. 29 No. 2, pp. 273-288.

Gupta, V. K., Turban, D. B., Wasti, S. A., & Sikdar, A. (2009). The role of gender stereotypes in perceptions of entrepreneurs and intentions to become an entrepreneur. *Entrepreneurship theory and practice*, Vol. 33 No. 2, pp. 397-417.

Guzman, J., & Kacperczyk, A. O. (2019). Gender gap in entrepreneurship. *Research Policy*, Vol. 48 No. 7, pp. 1666-1680.

Halpern, D. F. (2000). *Sex differences in cognitive abilities*(3rd ed.). Hillsdale, NJ: Erlbaum.

Hart, Y., Mayo, A. E., Mayo, R., Rozenkrantz, L., Tendler, A., Alon, U., & Noy, L. (2017). Creative foraging: An experimental paradigm for studying exploration and discovery. *PloSone*, 12(8), e0182133.

Heilman, M. E., & Okimoto, T. G. (2008). Motherhood: A potential source of bias in employment decisions. *Journal of Applied Psychology*, Vol. 93 No. 1, p. 189.

Henker, N., Sonnentag, S., & Unger, D. (2015). Transformational leadership and employee creativity: the mediating role of promotion focus and creative process engagement. *Journal of Business and Psychology*, 30(2), 235-247.

Hennessy, D. A., & Jakubowski, R. D. (2008). The impact of stressful commuting on subsequent performance during low versus high frustration tasks. *Advances in Psychology Research*, 54, 263.

Henningsen, L., Horvath, L. K., & Jonas, K. (2022). Affirmative Action Policies in Academic Job Advertisements: Do They Facilitate or Hinder Gender Discrimination in Hiring Processes for Professorships?. *Sex Roles*, 86(1), 34-48.

Henriksen, D., Creely, E., & Henderson, M. (2019). Failing in creativity: The problem of policy and practice in Australia and the United States. *Kappa Delta Pi Record*, 55(1), 4-10.

Henry, C., Treanor, L., Sweida, G. L., & Reichard, R. J. (2013). Gender stereotyping effects on entrepreneurial self-efficacy and high-growth entrepreneurial intention. *Journal of Small Business and Enterprise Development*, Vol. 20 No. 2, pp. 296-313.

Hills, G. E., Lumpkin, G. T., & Singh, R. P. (1997). Opportunity recognition: Perceptions and behaviors of entrepreneurs. *Frontiers of entrepreneurship research*, 17(4), 168-182.

Hora, S., Lemoine, G. J., Xu, N., & Shalley, C. E. (2021). Unlocking and closing the gender gap in creative performance: A multilevel model. *Journal of Organizational Behavior*, 42(3), 297-312.

Huang, L. (2018). The role of investor gut feel in managing complexity and extreme risk. *Academy of Management Journal*, Vol. 61 No. 5, pp. 1821-1847.

Hyde, J. S., & Linn, M. C. (1988). Gender differences in verbal-ability – a meta-analysis. *Psychological Bulletin*, 104, 53–69.

Israel Innovation Authority (2019), "The Innovation Authority launches a dedicated track for startups founded by women: 75% RandD grant for enterprises owned by women entrepreneurs", available at: https://innovationisrael.org.il/press_release/4284

Israel Innovation Authority. (2019). *Innovation Authority report*.

Israeli employment service, *Preparation for screening tests and assessment centers*.
<https://www.taasuka.gov.il/he/Applicants/JobSearchStages/pages/miunandhaaracha.aspx>

Iszák, F., Griffiths, M. D., & Demetrovics, Z. (2017). Creativity and psychoactive substance use: a systematic review. *International Journal of Mental Health and Addiction*, *15*(5), 1135-1149.

Ivancovsky, T., Kleinmintz, O., Lee, J., Kurman, J., & Shamay-Tsoory, S. G. (2018). The neural underpinnings of cross-cultural differences in creativity. *Human brain mapping*, *39*(11), 4493-4508.

Ivancovsky, T., Shamay-Tsoory, S., Lee, J., Morio, H., & Kurman, J. (2019). A dual process model of generation and evaluation: A theoretical framework to examine cross-cultural differences in the creative process. *Personality and Individual Differences*, *139*, 60-68.

Janssen, O. (2003). Innovative behaviour and job involvement at the price of conflict and less satisfactory relations with co-workers. *Journal of Occupational and Organizational Psychology*, *76*(3), 347–364.

Jennings, J. E., & Brush, C. G. (2013). Research on women entrepreneurs: challenges to (and from) the broader entrepreneurship literature?. *Academy of Management Annals*, Vol. 7 No. 1, pp. 663-715.

Jin, M., Chua, R. Y. J., & Bledow, R. (2017). Which Idea to Pursue? Gender Effect on Novel Idea Selection During Innovation Work. *Academy of Management Proceedings*, *2017*(1), 13233.

Kandler, C., Riemann, R., Angleitner, A., Spinath, F. M., Borkenau, P., & Penke, L. (2016). The nature of creativity: The roles of genetic factors, personality traits, cognitive abilities, and environmental sources. *Journal of Personality and Social Psychology*, *111*(2), 230.

Kanli, E. (2020). Assessment of Creativity: Theories and Methods. In *Creativity-A Force to Innovation*. IntechOpen.

Kanze, D., Huang, L., Conley, M. A., & Higgins, E. T. (2018). We ask men to win and women not to lose: Closing the gender gap in startup funding. *Academy of Management Journal*, Vol. 61 No. 2, pp. 586-614.

Kay, C.J., 1986. *The Identification of Catalysts Preceding Decision Making as Described by Innovators and Entrepreneurs*. University of San Francisco, San Francisco.

Kenett, Y., Baker, B., Hills, T., Hart, Y., & Beaty, R. (2021). Creative Foraging: Examining Relations Between Foraging Styles, Semantic Memory Structure, and Creative Thinking. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 43, No. 43).

Kickul, J., Gundry, L. K., Barbosa, S. D., & Whitcanack, L. (2009). Intuition versus analysis? Testing differential models of cognitive style on entrepreneurial self-efficacy and the new venture creation process. *Entrepreneurship theory and practice*, Vol. 33 No. 2, pp. 439-453.

Kim, K. H. (2008). Meta-analyses of the relationship of creative achievement to both IQ and divergent thinking test scores. *The Journal of Creative Behavior*, 42(2), 106-130.

Kimura, D. (2000). *Sex and cognition*. Cambridge, MA: MIT Press.

Koenig, A. M., Eagly, A. H., Mitchell, A. A., & Ristikari, T. (2011). Are leader stereotypes masculine? A meta-analysis of three research paradigms. *Psychological bulletin*, Vol. 137 No. 4, p. 616.

Kogan, N., & Wallach, M. A. (1964). *Risk taking: A study in cognition and Personality*. New York: Holt.

Kourilsky, M. L., & Walstad, W. B. (1998). Entrepreneurship and female youth: Knowledge, attitudes, gender differences, and educational practices. *Journal of Business venturing*, Vol. 13 No. 1, pp. 77-88.

- Kudret, S., Erdogan, B., & Bauer, T. N. (2019). Self-monitoring personality trait at work: An integrative narrative review and future research directions. *Journal of Organizational Behavior*, 40(2), 193-208.
- Kricheli-Katz, T., & Regev, T. (2021). The effect of language on performance: do gendered languages fail women in maths?. *NPJ science of learning*, 6(1), 1-7.
- Laguía, A., García-Ael, C., Wach, D., & Moriano, J. A. (2019). “Think entrepreneur-think male”: a task and relationship scale to measure gender stereotypes in entrepreneurship. *International Entrepreneurship and Management Journal*, Vol. 15 No. 3, pp. 749-772.
- Latham, S. F., & Braun, M. (2009). Managerial risk, innovation, and organizational decline. *Journal of Management*, 35(2), 258-281.
- Latu, I. M., Stewart, T. L., Myers, A. C., Lisco, C. G., Estes, S. B., & Donahue, D. K. (2011). What we “say” and what we “think” about female managers: Explicit versus implicit associations of women with success. *Psychology of Women Quarterly*, Vol. 35 No. 2, pp. 252-266.
- Lee, S. Y., Florida, R., & Gates, G. (2010). Innovation, human capital, and creativity. *International Review of Public Administration*, 14(3), 13-24.
- Legewie, J., & DiPrete, T. A. (2014). The high school environment and the gender gap in science and engineering. *Sociology of Education*, 87(4), 259-280.
- Lejuez, C. W., Read, J. P., Kahler, C. W., Richards, J. B., Ramsey, S. E., Stuart, G. L., & Brown, R. A. (2002). Evaluation of a behavioral measure of risk taking: the Balloon Analogue Risk Task (BART). *Journal of Experimental Psychology: Applied*, 8(2), 75.
- Lennox, R.D. & Wolfe, R.N. (1984), “Revision of the self-monitoring scale”, *Journal of Personality and Social Psychology*, 4(6), 1349-1364.
- Ling, Y., Simsek, Z., Lubatkin, M., & Veiga, J. (2008). Transformational leadership’s role in promoting corporate entrepreneurship: examining the CEO-TMT interface. *Academy of Management Journal*, 21 (3), 557-576.

- Lovelace, K., Shapiro, D., & Weingart, L. (2001). Maximizing cross-functional new product teams' innovativeness and constraint adherence: A conflict communications perspective. *Academy of Management Journal*, Vol. 44 No. 4, pp. 779–793.
- Lubart, T. I. (1999). Creativity across cultures. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 339–350). Cambridge, England: Cambridge University Press.
- Luksyte, A., Unsworth, K. L., & Avery, D. R. (2017). Innovative work behavior and sex-based stereotypes: Examining sex differences in perceptions and evaluations of innovative work behavior. *Journal of Organizational Behavior*, 39, 1– 14.
- Malmström, M., Johansson, J., & Wincent, J. (2017). Gender stereotypes and venture support decisions: how governmental venture capitalists socially construct entrepreneurs' potential. *Entrepreneurship Theory and Practice*, Vol. 41 No. 5, pp. 833-860.
- Mar'i, S. K., & Karayanni, M. (1983). Creativity in Arab culture: Two decades of research. *The Journal of Creative Behavior*, 16(4), 227–238.
- March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management science*, 33(11), 1404-1418.
- Marlino, D. L., & Wilson, F. (2003). *Teen girls on business: are they being empowered?*, Simmons School of Management and The Committee of 200, Boston, MA.
- Marlow, S., & Patton, D. (2005). All credit to men? Entrepreneurship, finance, and gender. *Entrepreneurship theory and practice*, Vol. 29 No. 6, pp. 717-735.
- Martín-Brufau, R., & Corbalán, J. (2016). Creativity and psychopathology: Sex matters. *Creativity research journal*, 28(2), 222-228.
- Matud, M. P., Rodríguez, C., & Grande, J. (2007). Gender differences in creative thinking. *Personality and individual differences*, 43(5), 1137-1147.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management review*, Vol. 31 No. 1, pp. 132-152.

- Mednick, S. A. (1962). The associative basis for creative process, *Psychological Bulletin* 69, 220-232.
- Metuki, N., & Lavidor, M. (2013). Applying advancements in neurolinguistic research to enhance semantic processing via cognitive training. *Journal of Neurolinguistics*, 26(6), 662-690.
- Meyer, V., Tegtmeier, S., & Pakura, S. (2017). Revisited: how gender role stereotypes affect the image of entrepreneurs among young adults. *International Journal of Gender and Entrepreneurship*, Vol. 9 No. 4, pp. 319-337.
- Miron-Spektor, E., Erez, M., & Naveh, E. (2011). The effect of conformist and attentive-to-detail members on team innovation: Reconciling the innovation paradox. *Academy of management journal*, 54(4), 740-760.
- Moe, A., Jansen, P., & Pietsch, S. (2018). Childhood preference for spatial toys. Gender differences and relationships with mental rotation in STEM and non-STEM students. *Learning and Individual Differences*, Vol. 68 No. 2018, pp. 108-115.
- Montford, W., & Goldsmith, R. E. (2016). How gender and financial self-efficacy influence investment risk taking. *International journal of consumer studies*, 40(1), 101-106.
- Mumford, M. D. (2000). Managing creative people: Strategies and tactics for innovation. *Human resource management review*, 10(3), 313-351.
- Mumford, M. D. (2003). Where have we been, where are we going? Taking stock in creativity research. *Creativity research journal*, 15(2-3), 107-120.
- Mumford, M. D., Whetzel, D. L., & Reiter-Palmon, R. O. N. I. (1997). Thinking creatively at work: Organization influences on creative problem solving. *The Journal of Creative Behavior*, 31(1), 7-17.
- Nelson, T. D. (Ed.). (2009). *Handbook of prejudice, stereotyping, and discrimination*, Psychology Press, New York, NY, pp.164-166.
- Nickerson, R. S. (1999). 20 Enhancing Creativity. *Handbook of creativity*, 392.

Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much?. *The quarterly journal of economics*, 122(3), 1067-1101.

Niederle, M., & Vesterlund, L. (2011). Gender and competition. *Annu. Rev. Econ.*, 3(1), 601-630.

Orser, B. J., Riding, A. L., & Manley, K. (2006). Women entrepreneurs and financial capital. *Entrepreneurship Theory and Practice*, Vol. 30 No. 5, pp. 643-665.

Padavic, I., Ely, R. J., & Reid, E. M. (2020). Explaining the persistence of gender inequality: The work–family narrative as a social defense against the 24/7 work culture. *Administrative Science Quarterly*, 65(1), 61-111.

Pagnani, A. R. (2011). Gender Differences. In Editors-in-Chief: Mark A. Runco & Steven R. Pritzker (Eds.), *Encyclopedia of Creativity (Second Edition)* (pp. 551–557). San Diego: Academic Press.

Phelan, J. E., Moss-Racusin, C. A., & Rudman, L. A. (2008). Competent yet out in the cold: Shifting criteria for hiring reflect backlash toward agentic women. *Psychology of Women Quarterly*, Vol. 32 No. 4, pp. 406-413.

Phipps, S. T., & Prieto, L. C. (2015). women versus men in entrepreneurship: a comparison of the sexes on creativity, political skill, and entrepreneurial intentions. *Academy of Entrepreneurship Journal*, 21(1).

Piacentini, M. (2013). Women entrepreneurs in the OECD: Key evidence and policy challenges.

Pick H., & Lavidor M. (2019). Modulation of automatic and creative features of the Remote Associates Test by angular gyrus stimulation. *Neuropsychologia*, 129, 348-356

Proudfoot, D., Kay, A. C., & Koval, C. Z. (2015). A gender bias in the attribution of creativity: Archival and experimental evidence for the perceived association between masculinity and creative thinking. *Psychological Science*, 26, 1751– 1761.

Reiter-Palmon, R., & Illies, J. J. (2004). Leadership and creativity: Understanding leadership from a creative problem-solving perspective. *The leadership quarterly*, 15(1), 55-77.

- Rhodes, M. (1961). An analysis of creativity. *The Phi Delta Kappan*, 42(7), 305-310.
- Rice, L., & Barth, J. M. (2016). Hiring decisions: The effect of evaluator gender and gender stereotype characteristics on the evaluation of job applicants. *Gender Issues*, Vol. 33 No. 1, pp. 1-21.
- Richardson, M., & Abraham, C. (2009). Conscientiousness and achievement motivation predict performance. *European Journal of Personality*, 23(7), 589-605.
- Rippon, G. (2019). *The Gendered Brain: The new neuroscience that shatters the myth of the female brain*. Random House.
- Rivers, M. L., Fitzsimmons, C. J., Fisk, S. R., Dunlosky, J., & Thompson, C. A. (2021). Gender differences in confidence during number-line estimation. *Metacognition and Learning*, 16(1), 157-178.
- Roberts, T. A., & Nolen-Hoeksema, S. (1994). Gender comparisons in responsiveness to others' evaluations in achievement settings. *Psychology of Women Quarterly*, 18(2), 221-240.
- Ronay, R., & Kim, D. Y. (2006). Gender differences in explicit and implicit risk attitudes: A socially facilitated phenomenon. *British Journal of Social Psychology*, 45(2), 397-419.
- Rudman, L. A., & Glick, P. (2001). Prescriptive gender stereotypes and backlash toward agentic women. *Journal of social issues*, Vol. 57 No. 4, pp. 743-762.
- Runco, M. A., & Acar, S. (2012). Divergent Thinking as an Indicator of Creative Potential. *Creativity Research Journal*, 24(1), 66–75.
- Runco, M. A., & Pritzker, S. R. (Eds.). (2011). *Encyclopedia of Creativity, Two-Volume Set, Second Edition* (2 edition). Boston, MA: Academic Press.
- Runco, M. A., Cramond, B., & Pagnani, A. R. (2010). Gender and Creativity. In J. C. Chrisler & D. R. McCreary (Eds.), *Handbook of Gender Research in Psychology* (pp. 343–357). Springer New York.

Saguy, T., Reifen-Tagar, M., & Joel, D. (2021). The gender-binary cycle: The perpetual relations between a biological-essentialist view of gender, gender ideology, and gender-labelling and sorting. *Philosophical Transactions of the Royal Society B*, 376(1822), 20200141.

Sak, U. (2016). Yaratıcılık, gelişimiveeğitimi.(2. Baskı). *Vize: Ankara*.

Sawyer, R. K. (2012). *Explaining Creativity: The Science of Human Innovation* (2 edition). New York: Oxford University Press.

Schein, V.E., Mueller, R., Lituchy, T. & Liu, J. (1996), “*Think manager - think male: a global phenomenon?*”, *Journal of Organizational Behavior*, Vol. 17 No. 1, pp. 33-41.

Schumpeter, J. A. (1934). Change and the Entrepreneur. *Essays of JA Schumpeter*.

Shalley, C. E., & Perry-Smith, J. E. (2001). Effects of social-psychological factors on creative performance: The role of informational and controlling expected evaluation and modeling experience. *Organizational behavior and human decision processes*, 84(1), 1-22.

Shalley, C. E., & Perry-Smith, J. E. (2001). Effects of social-psychological factors on creative performance: The role of informational and controlling expected evaluation and modeling experience. *Organizational behavior and human decision processes*, 84(1), 1-22.

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here?. *Journal of management*, 30(6), 933-958.

Shane, S., & Nicolaou, N. (2015). Creative personality, opportunity recognition and the tendency to start businesses: A study of their genetic predispositions. *Journal of Business Venturing*, 30(3), 407-419.

Shen, W., Hommel, B., Yuan, Y., Chang, L., & Zhang, W. (2018). Risk-taking and creativity: Convergent, but not divergent thinking is better in low-risk takers. *Creativity Research Journal*, 30(2), 224-231.

Simonton, D. K. (1994). *Greatness: Who makes history and why*. Guilford Press.

- Smith, J. B., Mitchell, J. R., & Mitchell, R. K. (2009). Entrepreneurial scripts and the new transaction commitment mindset: Extending the expert information processing theory approach to entrepreneurial cognition research. *Entrepreneurship Theory and Practice*, Vol. 33 No. 4, pp. 815-844.
- Snyder, M. (1979). Self-monitoring processes. *Advances in experimental social psychology*, 12, 85-128.
- Snyder, M. (1987). *Public appearances, Private realities: The psychology of self-monitoring*. WH Freeman/Times Books/Henry Holt & Co.
- Stein, M. I. (1953). Creativity and Culture. *The Journal of Psychology*, 36(2), 311–322.
- Sternberg, R. J. (2006). The nature of creativity. *Creativity research journal*, 18(1), 87.
- Sternberg, R. J., & Lubart, T. I. (1992). Buy low and sell high: An investment approach to creativity. *Current Directions in Psychological Science*, 1(1), 1-5.
- Stoltzfus, G., Nibbelink, B. L., Vredenburg, D., & Hyrum, E. (2011). Gender, gender role, and creativity. *Social Behavior and Personality: an international journal*, 39(3), 425-432.
- Subrahmanian, R. (2005). Gender equality in education: Definitions and measurements. *International Journal of Educational Development*, 25(4), 395-407.
- Torrance, E. P. (1974). *Torrance Tests of Creative Thinking*. Bensenville, IL: Scholastic Testing Service.
- Tyagi, V., Hanoch, Y., Hall, S. D., Runco, M., & Denham, S. L. (2017). The risky side of creativity: Domain specific risk taking in creative individuals. *Frontiers in psychology*, 8, 145.
- Tzameret, H., Herzog, H., Chazan, N., Basin, Y., Brayer-Garb, R., Ben Eliyahu, H., & Hasson, Y. (2021). *The Gender Index 2020; Gender Inequality in Israel*. The Van Leer Jerusalem Institute.

Unsworth, K. L., Brown, H., & McGuire, L. (2000). Employee innovation: The roles of idea generation and idea implementation. Presented at the Annual Conference of the Society for Industrial and Organizational Psychology, New Orleans, LA.

Vesterlund, L. (2011). Gender and competition. *Annu. Rev. Econ.*, 3(1), 601-630.

Vieito, J. P., & Khan, W. A. (2012). Executive compensation and gender: SandP 1500 listed firms. *Journal of Economics and Finance*, Vol. 36 No. 2, pp. 371-399.

Villalba, E. (2009). *Measuring Creativity*. Proceedings for the conference “Can creativity be measured?” Brussels, 28-29 May 2009. Luxembourg: Publication Office of the European Union.

Walters, J. & Gardner, H. (1986). The crystallizing experience. In: R. Sternberg, & J. Davidson (Eds.), *Conceptions of giftedness*. (pp. 306–331). Cambridge: Cambridge University Press

Warren, F., Mason-Apps, E., Hoskins, S., Azmi, Z., & Boyce, J. (2018). The role of implicit theories, age, and gender in the creative performance of children and adults. *Thinking Skills and Creativity*, 28, 98-109.

Wilson, F., Kickul, J., & Marlino, D. (2007). Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship theory and practice*, Vol. 31 No. 3, pp. 387-406.

Winslow, E. K., & Solomon, G. T. (1993). Entrepreneurs: architects of innovation, paradigm pioneers and change. *The Journal of Creative Behavior*, 27(2), 75-88.

Wolf, O. (2019, October 25), "The coveted cliché", Available at: <https://alaxon.co.il/thought/%D7%94%D7%A7%D7%9C%D7%99%D7%A9%D7%90%D7%94-%D7%94%D7%A0%D7%97%D7%A9%D7%A7%D7%AA/>.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of management review*, 18(2), 293-321.

Wulandari, S., & Hendrawan, D. (2021). Trust your Abilities More than the Stereotype: Effect of Gender-stereotype Threat and Task Difficulty on Word Production,

Clustering, and Switching in Letter Fluency. *Pertanika Journal of Social Sciences and Humanities*, 28(4), 2567-2588.

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of management journal*, 53(1), 107-128.

Zhao, Y. (2012). *World class learners: Educating creative and entrepreneurial students*. Corwin Press.

Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management journal*, 44(4), 682-696.

Zhou, J., & Hoever, I. J. (2014). Research on workplace creativity: A review and redirection. *Annual Review of Organizational Psychology and Organizational Behavior.*, 1(1), 333-359.

Appendix 1

Self-monitoring scale

לפניך רשימה של היגדים. לגבי כל היגד עליך לסמן עד כמה הוא מאפיין אותך :

מאוד לא מאפיין אותי	לא מאפיין אותי	מדי פעם מאפיין אותי	מאפיין אותי	מאוד מאפיין אותי	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	קשה לי לחקות את התנהגותם של אנשים אחרים
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	התנהגותי מביעה את תחושותי הפנימיות, עמדתי ואמונותי האמיתיות.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	במסיבות ובמפגשים חברתיים, אינני משתדל/ת לעשות או לומר דברים שימצאו חן בעיני אחרים
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני יכול/ה להביא נימוקים רק לטובת רעיונות שבהם אני כבר מאמינ/ה
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני יכול/ה לנאום ללא הכנה על נושאים שלגביהם אין לי כמעט מידע
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	חלק ניכר מהתנהגותי הינו הצגה שמטרתה להרשים או לבדר אחרים.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	כשאינני בטוח/ה כיצד להתנהג במצב חברתי, אני מחפש/ת רמזים מהתנהגות האחרים
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	כאשר אינני נהנה/ית, אני לעיתים קרובות מעמיד/ה פנים שאני נהנה/ית
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	לא תמיד אני האדם שאני נראה/נראית
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	לא הייתי משנה את דעותי (או את הדרך שבה אני עושה דברים) כדי לגרום הנאה למישהו או כדי לזכות בחיבתו.
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	שקלתי בדעתי להיות בדרך/ית
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	כדי להסתדר ולהתחבב על אחרים, אני נוטה להיות מה שאנשים מצפים ממני שאהיה

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	כנראה שהייתי יכול/ה להיות שחקן/ית טוב/ה
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	לעיתים רחוקות אני זקוק/ה לעצת חברי כדי לבחור בספרים, או במוזיקה
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	בקבוצה של אנשים, רק לעיתים רחוקות אני נמצא/ת במרכז תשומת
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני צוחק/ת יותר כאשר אני צופה יחד עם אחרים בקומדיה מאשר כשאני צופה בה לבדי
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	לפעמים אני נראה/ית לאחרים כחווה רגשות עמוקים יותר ממה שאני מרגישה/ה בפועל
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	לעיתים קרובות אני עשוי/ה להתנהג בצורה שונה, בהתאם לאדם איתו אני נמצא/ת או המצב בו אני נמצא/ת
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אינני טוב/ה במיוחד בלגרום לאנשים אחרים שיחבבו אותי
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אף פעם לא הייתי טוב/ה בחיקוי או במשחק תפקידים
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני מתקשה לשנות את התנהגותי כך שתתאים לאנשים ולמצבים שונים
מאוד לא מאפיין אותי	לא מאפיין אותי	מדי פעם מאפיין אותי	מאפיין אותי	מאוד מאפיין אותי	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	במסיבות אני מניח/ה לאחרים לספר בדיחות וסיפורים
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני מרגישה/ה מגושם במקצת בציבור ואינני מציג/ה את עצמי היטב
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני מסוגל/ת להסתכל לכל אחד ישר בעיניים ולספר שקר ללא ניד עפעף (למען מטרה צודקת)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	אני יכול/ה לרמות אנשים על ידי כך שאהיה ידידותי/ת כלפיהם כאשר למעשה אינני מחבב/ת אותם

Appendix 2

risk-taking questionnaire

להלן מוצגות דילמות שעשויות להתרחש בכל יום. בכל דילמה ישנה אפשרות בחירה בין שתי אפשרויות. ציין/ני עבור כל דילמה את מידת הסבירות בה היית בוחר/ת באפשרות ב' המוצגת על סולם דרגות של 1-7, כאשר 1 מייצג "סבירות נמוכה מאוד" ו-7 מייצג "סבירות גבוהה מאוד".

את/ה עובד/ת בארגון גדול ויציב. יש לך קביעות ומשכורת סבירה. את/ה עומד/ת בפני שתי ברירות:

א. להמשיך לעבוד בארגון

ב. לעבור לעבוד בחברה צעירה בה המשכורת גבוהה בהרבה אך הישרדותה בשוק אינה ודאית.

מה מידת הסבירות בה היית בוחר/ת לעבור לעבוד בחברה החדשה?

סבירות גבוהה מאוד	*	*	*	*	*	סבירות נמוכה מאוד	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	מה מידת הסבירות בה היית בוחר/ת לעבור לעבוד בחברה החדשה?

את/ה נוהג/ת בדרך לפגישת עבודה חשובה. מבט בשעון מראה לך כי הפגישה אמורה להתחיל בקרוב ואת/ה עלול/ה לאחר. את/ה עומד/ת בפני שתי ברירות:

א. נהיגה זהירה ובמהירות המותרת, במחיר של איחור אפשרי

ב. נהיגה במהירות גבוהה מהמהירות המותרת, בכדי להגדיל את הסיכוי להגיע בזמן.

מה מידת הסבירות בה היית בוחר/ת לנהוג במהירות?

סבירות גבוהה מאוד	*	*	*	*	*	סבירות נמוכה מאוד	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	מידת הסבירות בה היית בוחר/ת לנהוג במהירות

ברשותך סכום כסף שברצונך להשקיע. באפשרותך:

א. להשקיע במניות של חברה יציבה שערך מנייתה צפוי לעלות באופן ודאי בתקופה הקרובה, אך באחוז קטן יחסית.

ב. להשקיע במניות של חברת סטארט-אפ, שאם תצליח יעלה ערך מנייתה באחוז גדול מאוד בתקופה הקרובה. עם זאת, ייתכן שהחברה לא תצליח, ערך המניות יפחת ותפסיד/י חלק ניכר מכספך.

מה מידת הסבירות בה היית בוחר/ת להשקיע במניות של חברת הסטארט-אפ?

סבירות גבוהה מאוד	*	*	*	*	*	סבירות נמוכה מאוד	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	מידת הסבירות בה היית בוחר/ת להשקיע במניות של חברת הסטארט-אפ

את עומד/ת בתור ארוך לקנות כרטיסים לסרט. לפתע דוחף אותך בריון שנמצא מאחוריך ועוקף אותך. את/ה עומד/ת בפני שתי ברירות:

א. לוותר על התור כדי לא להסתבך עם אדם זה.

ב. להתעקש על מקומי בתור, גם במחיר של מריבה עמו.

מה מידת הסבירות בה היית בוחר/ת להתעקש על מקומך בתור?

סבירות גבוהה מאוד	*	*	*	*	*	סבירות נמוכה מאוד	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	מידת הסבירות בה היית בוחר/ת שלא לותר על התור

את/ה קפטן בקבוצת כדורסל. את/ה בעיצומו של משחק, קבוצתך בהפסד, ונותרה לך הזדמנות לבצע מהלך אחד אחרון לפני סיום המשחק. עליך לבחור בין:

א. ביצוע מהלך שיצליח באופן כמעט ודאי להביא לסיום המשחק בתוצאת תיקו.

ב. ביצוע מהלך מורכב שיביא לניצחון אם יצליח, אך להפסד אם ייכשל.

מה מידת הסבירות בה היית בוחר/ת לבצע את המהלך המורכב?

סבירות גבוהה מאוד	*	*	*	*	*	סבירות נמוכה מאוד	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	מידת הסבירות בה היית בוחר/ת לבצע את המהלך המורכב

Appendix 3

Entrepreneurial traits selection task

מהן 5 התכונות החשובות ביותר בעיניך כדי להוביל פרויקט יזמי (סטארטאפ)?

- חביבות
- ביישנות
- אסרטיביות
- מנהיגות
- נכונות לעזור לאחרים
- חברותיות
- נדיבות
- עצמאות
- תחרותיות
- כנות
- התמדה
- ביטחון עצמי גבוה
- רגישות
- שאפתנות
- תקיפות
- החלטיות
- אכפתיות
- יכולת מילולית גבוהה

תקציר

יצירתיות הינה מרכיב מפתח ביזמות ובחדשנות, שבתורם, תורמים לצמיחה חברתית וכלכלית. אך בעוד שלנשים ולגברים ביצועים שווים במבחני יצירתיות סטנדרטיים, לנשים פחות הזדמנויות ויותר חסמים בדרכן אל מימוש הישגים יצירתיים ויזמיים. זאת לרוב בשל סיבות סוציולוגיות ותרבותיות, המביאות אותן להיות רגישות יותר מגברים לשיפוט וביקורת מהסביבה וכן לקחת פחות סיכונים (Jin, Chua & Bledow, 2017). בנוסף, נשים מופלות לרעה בחלק מן החברות והארגונים, מה שפוגע בסיכוייהן להוציא אל הפועל רעיונות יצירתיים כמו לדוגמה בתחום היזמות. העבודה המוגשת להלן מציגה ממצאים של שלושה מערכי מחקר שנבנו על מנת לבחון שלושה גורמים שנמצאו קשורים להבדלי מגדר ביצירתיות וביזמות, כתחום המבטא יכולת יצירתית.

הגורם הראשון שבדקנו היה **שיפוט** וההשפעה שלו על ביצועים יצירתיים. במחקר זה משתתפים ומשתתפות ביצעו מבחן למדידת יצירתיות תחת תנאי שבו הדגשנו שהתוצרים היצירתיים יעמדו לשיפוט ויקבלו ציון. הממצא המרכזי במחקר זה הראה שנשים וגברים הושפעו באופן שונה מהתפעול שלנו כך שנשים לא הושפעו כלל וגברים הושפעו לטובה וביצועיהם השתפרו משמעותית. הגורם השני שבחנו היה **לקיחת סיכונים**. במחקר זה, עודדנו נשים וגברים לקחת סיכונים ואז בדקנו את הביצועים שלהם במבחני יצירתיות. מצאנו שעידוד הנטייה לקחת סיכונים תרם לביצועים של נשים ופגע באלה של הגברים, אך רק בחלק מצומצם של המדדים, כשברובם לא נמצא הבדל בין הקבוצות. הגורם השלישי שבדקנו מתמקד בסביבה ולא במאפיינים האישיותיים של נשים וגברים והוא **חשיבה סטריאוטיפית** והטיה בפועל כלפי מיזמים המובלים ע"י נשים וגברים. במחקר זה, מצאנו שישנה חשיבה סטריאוטיפית רווחת בקרב גברים ונשים כאחד הרואה ביזם האידיאלי דמות של גבר, ויחד עם זאת, חשיבה זו לא התבטאה בהטיה לרעה של הערכות מיזמים בהובלת נשים.

המסקנות שלנו הן שפערים בין המינים מופיעים בצורה מורכבת ולעתים קרובות בלתי צפויה בתחומי היצירתיות והיזמות. נראה שבמקרים מסוימים ניתן לייצר בקלות פערי מגדר בביצועים, על ידי שינוי קל של הוראות הבדיקה למשל, ובמקרים אחרים ניתן "לתקן" את הפער במידה מסוימת על ידי עידוד לקיחת סיכונים. עם זאת, התערבויות שונות יכולות להשתנות בהשפעתן על גברים ונשים, ויש לקחת זאת בחשבון. באופן דומה, חשיבה סטריאוטיפית כלפי נשים וגברים, כיזמים, עדיין קיימת ומתבטאת בכל מיני אופנים בשוק העבודה, אבל נראה שהיא לא תמיד נחשפת

במחקר אמפירי מכל מיני סיבות. עובדה זו מקשה על הסקת מסקנות חד משמעיות על חלק מהתהליכים שבהם נוצרים ומשתמרים הבדלי מגדר ועל כן, אנו סבורות כי יש להמשיך ולחקור את הצמתים הללו בין מגדר, יצירתיות ויזמות. הבנה טובה יותר של הקשר בין מגדר, יצירתיות ויזמות יכולה לתרום לנשים שתוכלנה לממש את הפוטנציאל היצירתי שלהן ביתר קלות, ולחברה שוויונית וצודקת יותר.

תוכן העניינים

I	תקציר
1	הקדמה
3	יצירתיות
5	התהליך היצירתי
6	הבדלי מגדר בתהליך היצירתי
8	יזמות, יצירתיות ומגדר
	פרק 1: שיפוט ואי-שוויון מגדרי: השפעת הציפייה לשיפוט והערכה על ביצועים של גברים ונשים במבחן למדידת יצירתיות
11	הקדמה
14	יצירתיות, שיפוט ומגדר
15	יצירתיות, מגדר וניטור-עצמי
16	תהליך המחקר
17	שיטה
17	משתתפים
18	כלים
19	הליך
19	תוצאות
20	ניטור-עצמי
20	שיפוט, יצירתיות ומגדר
23	דיון
26	מגבלות המחקר
26	מסקנות
	פרק 2: חקר ההשפעה האינטראקטיבית של לקיחת-סיכונים ומגדר על יצירתיות
28	הקדמה
28	יצירתיות ולקיחת-סיכונים
29	לקיחת-סיכונים ומגדר
30	לקיחת-סיכונים, מגדר ויצירתיות
32	שיטה
32	משתתפים
32	כלים
34	הליך
34	תוצאות
35	לקיחת-סיכונים: בדיקת מניפולציה
35	לקיחת-סיכונים, מגדר וביצועים יצירתיים במדד ה-AUT

36	..... לקיחת-סיכונים, מגדר וביצועים יצירתיים במדד ה-CFG
38	..... דיון
40	..... מגבלות המחקר
40	..... מסקנות
42	..... פרק 3 : כשסטריאוטיפים אינם מנבאים אפליה : פרדיגמת מחקר משולבת לבחינת הטיה מגדרית של יזמים, יזמיות ומיזמים טכנולוגיים
42	..... הקדמה
43	..... הערכת מיזמים לעומת הערכת יזמים ויזמיות
45	..... תיאוריית ההתאמה לתפקיד מגדרי ויזמות
46	..... מדד הסטריאוטיפ
47	..... מגדר המעריכה
48	..... תהליך המחקר
50	..... שיטה
50	..... משתתפים
50	..... כלים
53	..... הליך
53	..... תוצאות
54	..... השפעת מגדר היזמות (המניפולציה המחקרית) ומגדר המעריכה על הערכת המיזמים
56	..... תכונות יזמיות הקשורות למגדר
57	..... הקשר בין חשיבה סטריאוטיפית והטיה מגדרית בהערכת מיזמים
58	..... דיון
61	..... מגבלות המחקר
62	..... מסקנות
64	..... דיון כללי
69	..... רשימת מקורות
91	..... נספח 1
91	..... שאלון ניטור-עצמי
93	..... נספח 2
93	..... שאלון לקיחת-סיכונים
96	..... נספח 3
96	..... בחירת תכונות המתאימות להובלת פרויקט יזמי
א	..... תקציר

עבודה זו נעשתה בהדרכתה של

פרופ' מיכל לבידור

המחלקה לפסיכולוגיה, אוניברסיטת בר אילן

הבדלי מגדר, לקיחת סיכונים וניטור עצמי בתהליך היצירתי

חיבור לשם קבלת התואר "דוקטור לפילוסופיה"

מאת:

תאיר תג'ר-שפיר

היחידה ללימודים בין תחומיים

התוכנית ללימודי מגדר

הוגש לסנט של אוניברסיטת בר-אילן

אייר, תשפ"ב

רמת גן