



University
of Stavanger

ARVID SUNDSTRØM AND HARALD ØSTEBØ ØSTHUS
SUPERVISOR: ESPEN SAGEN

A Mindset Intervention in an Organizational Context

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Abstract

Research demonstrates that mindset can be shaped through interventions, but there exist limited studies on how they impact in organizational work contexts. The objective of this master thesis is primarily to examine if a mindset intervention, that targets growth mindset and stress mindset, can change the mindset of employees and increase job satisfaction. Even though there is a large amount of research that indicates effects of interventions on children and students in educational environments, there has not yet been performed a synergic intervention on employees in context to job satisfaction, as we know of.

In this pilot study we conducted an experiment, consisting of a synergistic mindsets intervention that was subjected to employees in a consulting firm. The intervention, which is an online training module, consisted of two sessions with a 2-week break in between. 28 of the 44 who started the first session completed the likert scale survey and intervention, while 10 participants started and completed the second session. All participants who completed the first survey were randomized into either treatment or control condition. We investigated if the intervention had any impact on the three outcome measures. (1) Level of growth mindset; (2) Level of stress mindset; (3) Level of job satisfaction. The aim was to examine if employees changed their mindsets, and if a change could impact perceived job satisfaction.

Our results are analyzed by performing a regression with robust standard errors. The results yield positive treatment effects across all measures, with job satisfaction showing significant improvements after treatment (N=10). We find that growth mindset increases by 33% ($p > 0,1$), stress mindset by 20% ($p > 0,1$), and job satisfaction increases significantly by 116% ($p < 0,1$) when controlling for treatment.

This indicates that it could be possible to increase job satisfaction for employees through a synergetic mindset intervention. However, the sample size was not sufficient and thus was not representative, meaning that the outcomes of this trial must be interpreted with caution. Nonetheless, our study indicates that intervention could be a valuable resource for organizations to use, being both time efficient and cost-effective, however further research on the topic is necessary in order to conclude.

Preface:

This thesis concludes our master's degree in business administration at the University of Stavanger. The process has been both challenging and difficult, but it has also been a very enlightening and inspiring time in our life. When attending one of our courses in the fall of 2022, we learned about “growth mindset” in a lecture, which we found quite fascinating, and wanted to explore in an organizational context. After consulting our thesis supervisor, Espen Sagen on this topic, we landed on creating a synergistic mindsets intervention.

Foremost we would like to use this opportunity to thank our thesis supervisor, Espen Sagen at the University of Stavanger for excellent guidance and support throughout the process. He has been a great inspiration and provided constructive feedback and valuable input. We would also like to thank everyone who devoted time and effort to participate in our experiment. Your contributions have been invaluable and are very appreciated. Finally, we would like to thank our families, fellow students, and employees at UiS Business School for a wonderful and educational time.

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Harald Østebø Østhus

Arvid Sundstrøm

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1.0 Introduction

According to Haddon (2018), mental health is one of the key contributors to productivity, and employers should do more to ensure the mental well-being of their staff. Among the factors that can affect well-being in the workplace are work-related stress, high workload and time pressure, and job dissatisfaction. Stress in the workplace is likely to impact all professions. The physical and mental health is affected by work-related stress (Daniel, 2019).

Stress is predominantly viewed in a bad light by most people, and by many researchers. However, literature in the psychological and economical field has investigated a theory, referred to as “stress-can-be-enhancing mindset,” which sheds light over the belief that our psychological stress response can be positive for performance. Once you understand its purpose you can control it, by utilizing the enhanced capacity for performance. It is rather common to perceive it as a barrier, which is referred to as “stress-can-be-debilitating mindset” (Yeager, 2022).

Avoiding stressful situations increases the risk of missing valuable opportunities to learn and grow. In entity implicit theory the outcome is similar, where it is argued that people with a “fixed mindset” believe that attributes such as personality, intelligence and abilities are fixed and resistant to change. As a result, they avoid challenges as failure is feared and reflects their own limitations. In incremental implicit theory, people with a “growth mindset” believe that human behavior which influences an individual's abilities, can be developed over time (Heslin & Keating, 2019). In response to effort, strategies and help from others, they believe that intelligence can grow and improve.

There have been a fair amount of interventions that have sought to shape people's mindsets. Dweck (2006) and Yeager and Dweck (2012) designed and further developed a well-validated growth mindset intervention that aimed to change people's beliefs about effort. The growth mindset intervention has demonstrated that it is possible to shape students' beliefs in their ability to learn and cause lasting effects. More recently, Yeager et. al. (2022) designed and conducted a short (around 30 minutes) intervention that targeted the complementary of both growth mindset and stress-can-be-enhancing mindset. The intervention displayed the two mindsets as a connected and complementary unit, and sought to shape adolescents' assessments of the

stressful demands on them. They argue that an integration of these two mindsets is necessary to optimize stress management in real-world settings (Yeager et. al., 2022).

Even though there is a large amount of data that proves the effects of interventions on children and students, there has not yet been performed a synergic intervention on employees in context to job satisfaction. Yeager et. al. (2022) emphasize that they are optimistic that synergistic mindsets could have protective effects in a wide range of normal stressors, including in the workplace. We theorize that the positive effects of mindset interventions in influencing individuals' mindset beliefs extend beyond academic settings. In particular, we suggest that employees that embrace challenges and utilize learning, and have increased awareness around stress management, will have the potential to foster a sense of fulfillment and job satisfaction at the workplace. Job satisfaction is a parameter that is important for an organization. Increased job satisfaction results in less turnover in a business and may also lead to increased performance from the employees. In a meta-analysis of 39 correlations, Carsten & Spector (1987) found that there was a negative correlation between satisfaction and turnover. Also, recruiting new employees is expensive, both in terms of job training and the recruitment process. Hence, reducing turnover could have beneficial effects on a firm's expenses.

In this pilot study, we investigate if a synergic mindset intervention, conducted on employees, which seeks to both shape a growth mindset, as well as a stress-can-be-enhancing mindset, can reduce overall stress levels and increase belief in learning and own abilities. Consequently, shaping the mindsets of employees could increase their job satisfaction. Conducting an online intervention is both practically feasible, and can be administered at low cost, both to firms and other actors. To the best of our knowledge, studies involving this type of intervention on employees have not yet been performed.

Before the intervention, all participants were randomly divided between a control and a treatment group by the Qualtrics program. The treatment group received a synergic mindset intervention and was based on the intervention used in Yeager et. al. (2022), which we further modified to fit the context of the employees. The treatment consisted of reading and writing assignments and focused on 1) information about how the brain develops and grows 2) how the body responds to stress, and 3) how to use stress responses as a useful tool. The control group was given information about healthy habits to improve well-being. 10 employees located in Norway in a Scandinavian firm completed the study in the spring of 2023. We had 44

participants in the first session, but unfortunately only ten of them completed the second session. Therefore, we did not reach our target of having 30 to 50 participants in the study. All the employees were recruited through a published post on the firm's own workplace application. They could sign up to the study voluntarily by entering a link and be randomly assigned to either treatment or control group.

Our results indicate that the synergetic mindset intervention had a positive, but not significant, effect on growth (33%) and stress mindset (20%). It also had a substantial positive effect on job satisfaction (116%), which was statistically significant ($p < 0,1$). However, due to the issues with the sample's representativeness, we cannot reach any conclusions regarding these results. However, the results do indicate that the synergetic mindset intervention might have potential to increase responses to all three measure units. A larger scale study is needed to conclude on this topic.

Our study contributes to two topics of economic literature. First, our study further enhances the literature on organizational behavior and human resource management. By building on the work of Dweck (2006), Grant & Dweck (2003), and Yeager (2022), our study extends the literature by examining the impact of growth and stress mindset on job satisfaction. By empirically investigating the link between these mindsets and job satisfaction, we provide empirical data that supports the theoretical proposition of this field. Practitioners and managers can apply this information to design interventions and strategies aimed at improving employees' satisfaction and organizational performance (Bakker, A. B., & Demerouti, E. (2008).

Second, the study also contributes to the literature on human capital and labor economics, by exploring how individual characteristics in our study, such as growth and stress mindset, influence job satisfaction levels. By investigating these relationships, we advance the understanding of the human capital aspects of employee wellbeing, job satisfaction, and their potential influence on productivity (Heckman et. al., (2006); Borghans et. al., (2007); Cunha & Heckman, (2007); Almlund et. al., (2011)).

The following of this thesis contains an explanatory theoretical background in which we derived our research questions from. This is followed by a chapter on the design of our intervention, where it is thoroughly described and tested for validity. Next, there is a chapter which describes our sample background, and how they fared through the sessions. After this we present and

interpret our empirical results. Lastly, we end our thesis with a discussion and conclusion of our findings.

2.0 Theory

This chapter will give a more thorough explanation of growth and stress mindset, and their combination in a synergetic mindset. Additionally, we discuss the importance of job satisfaction and consider how it can be affected by mindset theories. Along with the theoretical fundament we will present findings from empirical research regarding previously performed interventions. The basis of our analysis, our research questions, will be introduced by the end of this chapter, and are based on both theory and previous empirical research.

2.1 Growth mindset

Growth mindset (also known as incremental implicit theory) is the belief that you can improve and develop your abilities and intelligence through dedication and hard work. When someone with a growth mindset faces challenges, they consider it an opportunity to learn and grow. Therefore, this mindset can help individuals achieve their goals in face of challenges, as they know it is possible to achieve, the only obstacle is their persistence. Research shows that people with a growth mindset on average perform better within academics and have a better career outcome than individuals with a fixed mindset (Bettinger et. al., 2018; Blackwell et. al., 2007; Claro et. al., 2016; Haimovitz & Dweck, 2017; Mangelset et. al., 2006; O'Rourke et. al., 2014; Yeager & Dweck, 2012). They are more willing to take risks, seek out feedback, and learn from their mistakes afterwards. In contrast, those with a fixed mindset understand their abilities as fixed, and this leads to fear of failure and reluctance to face new challenges. (Dweck, C. S., 2006)

Individuals with a growth mindset use challenges as a learning opportunity, and further have greater perseverance when confronted with difficult learning opportunities, compared to individuals with a fixed mindset. Those with a fixed mindset instead tend to be drawn to challenges that are easy, as it will validate their abilities to themselves and others. Consequently, they will try to avoid academic challenges, as challenges may harm their self-image of being smart (Bettinger et. al., 2018; Blackwell et. al., 2007; Haimovitz et. al., 2011;

Haimovitz & Dweck, 2017; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Yeager & Dweck, 2012).

Today's research finds that individuals with a growth mindset believe that through effort they can improve their abilities and intelligence. An individual with a growth mindset may say that *“if I work hard with learning this language, I will become better at it.”* Instead of avoiding exertion, they believe that challenging work will improve their intelligence and abilities. Those who have a fixed mindset instead avoid difficult challenges and harbor unproductive beliefs about effort. They instead believe that hard work and effort indicates incompetence in a subject. As an example, a fixed mind individual may say *“if I have to work hard with microeconomics, I am not smart at microeconomics”* (Bettinger et. al., 2018; Blackwell et. al., 2007; Haimovitz & Dweck, 2017; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Yeager & Dweck, 2012).

When those with a growth mindset face failure or setbacks, they do not believe it is a lack of ability. Rather, they increase their effort, try different learning strategies, and seek help from others to learn and overcome challenges. Opposite, when those with a fixed mindset believe their intelligence and abilities are fixed, and so setbacks and failure are seen as challenges that cannot be overcome. As they believe they cannot improve their intelligence, they meet these challenges with helplessness. Instead of asking for help or feedback when they struggle, those with a fixed mindset tend to rather hide their failures and lie about their performance as an attempt to be perceived as smarter/better than they are (Bettinger et. al., 2018; Blackwell et. al., 2007; Haimovitz et. al., 2011; Haimovitz & Dweck, 2017; Hong et. al., 1999; Mueller & Dweck, 1998; Yeager & Dweck, 2012).

Many studies find that children and students can adapt more of a growth mindset and spur their motivation and ability to learn within a short period of time. In these studies, they have used incremental theory of intelligence interventions, to promote lasting academic improvements for the students. These interventions' goal is to shape the beliefs in their ability to learn, by introducing facts on the brain's potential for growth and improvement, which can be done through effort and good learning strategies. They are designed to counter a fixed mindset and instead make the participant adapt more of a growth mindset. Studies that use growth mindset interventions show that students' mindsets can be changed in a short span of time: Interventions spanning over 2-8 sessions, and lasting from 90-200 minutes, have resulted in a significant

increase in students' beliefs in their own ability to learn (Aronson et. al., 2002; Bettinger, 2018; Blackwell et. al., 2007; Good et. al., 2003; Paunesku et. al., 2015; Yeager et. al., 2016).

2.2 Stress-can-be-enhancing mindset

Stress has been defined in different ways over the years. Daniel (2019) defines it as “*a condition in which any human is confronted with an opportunity or demand related to what they desire and for which the outcome is perceived to be both uncertain and important*”. It is predominantly viewed in a bad light by most people, and by many researchers. This mostly stems from stress having a reputation of negative effects on psychological and physiological consequences, and this reputation is amplified through media and old beliefs. As stress is viewed negatively, a lot of research has been done on how stress can be managed or removed in such a way that it does not affect the individual anymore (Lazarus & Folkman, 1984).

Stress management theory has previously focused on how people manage or prevent the negative effects of stress; how they cope with it. Crum et. al. (2013) frames three limitations regarding coping and stress. First, avoiding stress or reducing stress can be hard, and even contradicting. Second, coping stress is variable, complicated and has the potential to cause even more stress. For example, in controllable stressful settings, problems focused coping is useful, but when meeting uncontrollable stressors or when there are no problems to solve, coping is maladaptive. Third, these approaches support the mindset that stress-is-debilitating, and is the belief that stress is uncontrollable and harmful. It is argued that repetitive portrayals of stress in a negative light can both increase the chance of forming stress-is-debilitating mindsets and cause automatic responses that can result in harmful outcomes.

A different approach in stress management theory focuses on how the mindsets can determine the outcome of how people manage stress. “Stress-can-be-enhancing” mindset (stress mindset) depicts that psychological stress responses can be positive for performance. We have individuals who hold the belief that there are various positive stress-related outcomes (performance, productivity, etc.) from stress. The responses such as racing heart, sweaty palms, and deeper breathing, mobilize energy and deliver more oxygenated blood to the brain and tissues. Once you understand its purpose, you can control it, by utilizing the enhanced capacity for performance, rather than seeing it as a distraction (Yeager et. al., 2022). Crum et. al. (2013)

find that stress mindset can be changed and shaping it to a stress-can-be-enhanced mindset can result in increased self-reported health and work-performance.

By messaging the stress-can-be-enhancing mindset, people can be encouraged to be aware of their psychological stress response activation. Further, engagement with challenging stressors often follows as a helpful resource, rather than as an obstacle, which empowers their chase of goals and needs (Yeager et. al., 2022).

2.3 Synergistic mindsets

It is argued that an integration of growth mindset and stress-can-be-enhancing mindset are necessary to optimize stress management in real-world settings. If a student believes that challenging events can be valuable (*an event-focused growth mindset*), but also believes that their stress response is harmful and uncontrollable (*a response-focused stress-is debilitating mindset*), the activation of stress response could stop them from pursuing stressful but valuable learning experiences. Similarly, if a student understands and utilizes their stress response (*a response-focused stress-is enhancing mindset*) but struggles to face difficulties and failure (*an event-focused fixed mindset*), they could still be disengaging from stressful situations and miss out on valuable learning experiences (Yeager et. al., 2022). This mechanism is demonstrated in Table 1, and four scenarios are presented.

Table 1: Mindsets influence on stress and learning

	Event-focused growth mindset	Event-focused fixed mindset
A response-focused stress-is enhancing mindset	Engage in stressful demands, and see challenges as valuable learning experiences	Risk of disengaging from stressful demands any time they encounter difficulty or failure
A response-focused stress-is debilitating mindset	Activation of stress might deter them from pursuing stressful but valuable learning experiences	Avoids demands both as a result of encountering difficulty or failure, and activation of stress

The synergistic mindsets intervention in Yeager et. al. (2022) follows this way of thinking, by targeting both mindsets simultaneously. The two mindsets are displayed as a connected and

complementary unit and seek to shape individuals' assessments of stressful experiences. Consequently, the intervention can communicate the message that both stressful events, and stress responses can be utilized in support of valuable goals and learning experiences. It is found that the participants with a dual negative mindset before the intervention who received treatment, exhibited levels of total peripheral resistance (TPR) that were distinct from controls with dual positive mindsets before intervention. TPR is defined as "*a measure for vasoconstriction in the body's periphery, and a primary indicator of threat-type stress responses.*" In addition, they measured larger effects in cardiovascular responses in the synergistic intervention, compared to the single-mindset interventions (Yeager et. al., 2022).

In conclusion, a synergistic mindsets intervention that targets both growth- and stress-can-be-enhancing mindset holds promising results in the field. Instead of coping with stress as a variable that needs to be avoided, stress can be applied as a tool to improve performance. As Crum et. al. (2013) state, the aim is not to encourage respondents to seek out more stressful situations. The goal is to communicate that people do not need to focus entirely on reducing stress and make them acknowledge the enhancing effects a stressful situation can provide. Consequently, an individual can take on challenges they previously avoided, and gain valuable learning experiences. Similarly, the effects could derive from developing a growth mindset, as Table 1 illustrates. How the overall effects are realized depends on where on the scale an individual stands, but the aim is to move them closer to the top left corner by shaping one or both mindsets. Lastly, Yeager et. al. (2022) is optimistic about a synergistic intervention in the workplace, and this is what we seek to investigate. Stress-can-be-enhancing mindset will be referred to as "stress mindset" for the rest of the paper.

2.4 Job Satisfaction

We want to investigate whether a mindset intervention can impact behavior in a real-world setting. In this chapter, we will theorize why job satisfaction is important in our context, and how a synergistic mindset could have a positive impact on the variable.

Locke (1976) identified job satisfaction as a positive emotional state that results from an appraisal of one's job and job experiences, or from the perception that a job fulfills one's needs and important job values. Job satisfaction tends to increase with age (Brush et. al., 1987; Siu et. al., 2001) or has a U-shaped distribution in which new entrants to the workforce and older

workers have the highest job satisfaction (Hochwarter et. al., 2001). They suggest that older workers are more satisfied because of better coping skills and well-being. Because of this, we have included age as a factor in our research as it may have some impact on the participants' base values and might also affect how they get affected by our intervention. Research also finds that men and women are equally satisfied with their jobs (Brush et. al., 1987). Because of this, we do not expect any differences caused by gender in our studies, but the factor is still included to be checked for.

Job satisfaction is a parameter that becomes important for an organization because they want employees to stay in their employment. Increased job satisfaction results in less turnover in a business and may also lead to increased performance from the employees. In a meta-analysis of 39 correlations, Carsten & Spector (1987) found that there was a negative correlation between satisfaction and turnover.

Employees with more of a fixed mindset, may perceive less job satisfaction if they are not able to perform or learn the skills required, as they might feel appraisal from their work. By developing more of a growth mindset, employees are more likely to develop their skills and thrive. For example, an employee can be assigned to a new project where it is needed to learn a new computer program. With a growth mindset, she will meet the challenge with enthusiasm, and as an opportunity to expand her skills and knowledge. Because of the interest, she finds online tutorials, attends learning seminars, and seeks feedback from colleagues. In face of obstacles, she persists, and changes approaches instead of giving up. When the project is complete, because of this, she feels a sense of accomplishment and satisfaction. Because of her growth mindset she managed to understand the program and overcame the challenge, which again led to increased job satisfaction.

A stress enhancing mindset becomes more important, the more stress there is in a job. As an example, if an employee works in a high-pressure sales environment, where meeting targets and deadlines is crucial, they often face stressful situations that can impact their performance and job satisfaction. By having a stress enhancing mindset he views the stress as a natural part of the job and believes he can harness it to perform better. When faced with a difficult sales target, he uses the pressure as motivation to push harder. He channels the stress into focus and energy, sets clear goals and develops effective strategies to meet the target. He values stress as

an opportunity to fuel performance, and as a result, consistently meets and exceeds his sales goals, which boosts his confidence and job satisfaction.

In a synergistic mindset, where someone combines both a growth mindset and a stress-enhancing mindset, they might also get an even bigger job satisfaction boost out of the synergies. (1) If an employee who works as a marketing professional embrace a synergistic mindset, she will see challenges as opportunities to learn and grow, and the stress induced from the challenge will help in overcoming it and learn. She will therefore harness both the understanding that by time and dedication she is able to learn and complete the challenge, and the stress induced will help her to better learn and focus on the task. (2) If the salesperson is not reaching sales goals, even though he embraces stress, a growth mindset can be fundamental regarding if he evaluates the failure as opportunities to learn or personal setbacks, which again could impact job satisfaction. (3) It could also be the other way around. If the salesperson embraces stress, but avoids challenges, he can miss many opportunities, and feel less satisfaction. Thereby, by combination, the mindsets could fuel one another to be more efficient and support each other.

In all these examples we expect that the employee will get increased job satisfaction, which stems from them being able to perform their tasks at work and feeling adequate in their work. By being able to perform and with better productivity from learning and understanding instead of just getting by, they gain appraisal and recognition from other employees and superiors. It also fulfills a need employees have in their work, where they get challenged and can make a difference.

Work related stress is a vital factor to job satisfaction and is often viewed negatively. However, when the stress is functioning as a motivator, it leads to creativity and satisfaction, which again removes boredom and mundanity. It can however also lead to aggression and low job satisfaction if it functions as a negative factor for the employee (Halkos, George (2008)).

2.5 Research questions

From the presented growth mindset, stress mindset, synergistic mindsets, and job satisfaction literature we find:

- 1) That stress is not necessarily bad if the individual is able to use the stress as a resource to pursue goals, rather than perceiving it as a problem.
- 2) That believing you can become better and therefore working hard to achieve your goals, is important for ability improvement.
- 3) A synergistic mindsets intervention that targets both growth and stress mindset as an intertwined and complementary unit, can improve stress management as well as encourage challenge-seeking that contribute to valuable learning experiences.

Lastly, we theorize that improvements in these levels can lead to higher job satisfaction, and in turn lead to greater work performance. By conducting a synergistic mindsets intervention in a workplace, we propose the following research questions:

1. *“Can a synergistic mindsets intervention increase employees' belief in their abilities and learning?”*

2. *“Can a synergistic mindsets intervention shape an employee's mindsets regarding stress management?”*

Further, we have also derived a research question on why job satisfaction could be affected by a synergistic mindsets intervention. We want to investigate whether the intervention can also change their behavior, specifically by collecting their self-reported job satisfaction. Therefore, we have included an additional research question:

3. *“Will an increase in growth mindset and/or stress mindset increase job satisfaction?”*

Our theoretical approach is summarized in figure 1 below.

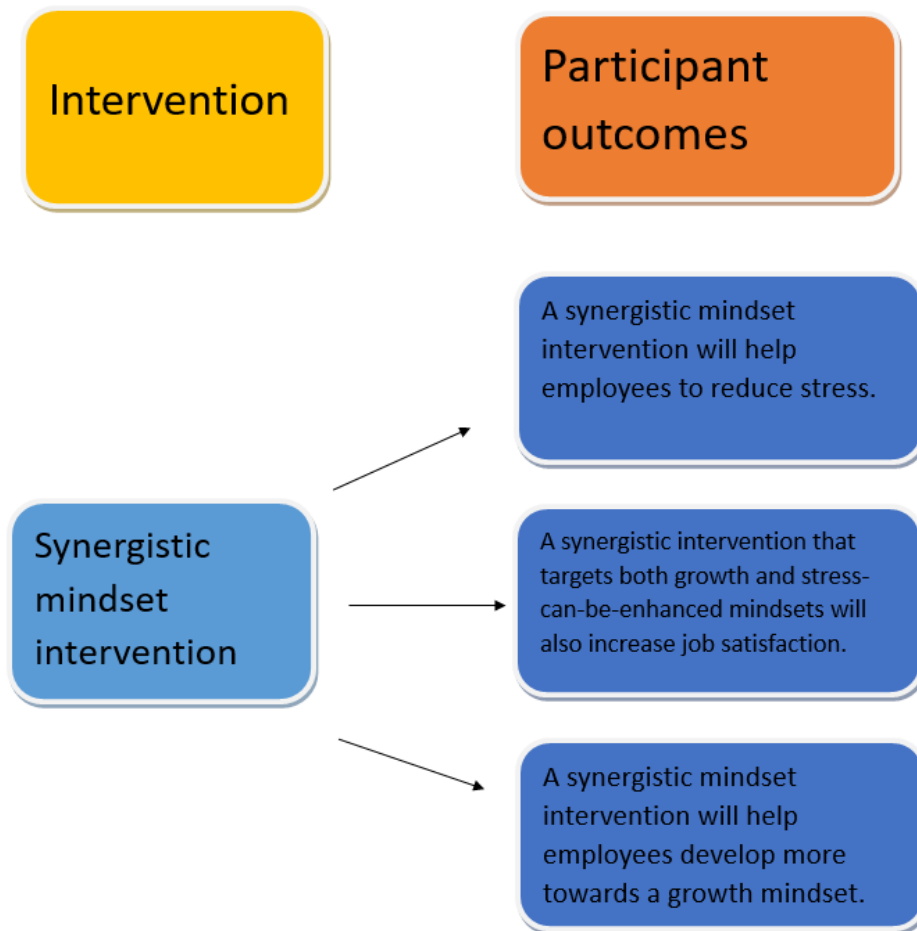


Figure 1: Effects of synergistic mindsets intervention

3.0 Experimental design

We wanted to investigate if employees can adapt more of a growth mindset and stress mindset, which we hypothesized should encourage them to take on more challenges and become more productive and satisfied in their job. With that in mind we developed an intervention consisting of two online sessions. We estimated that the first session would last for 30 minutes, and the second session would take five minutes.

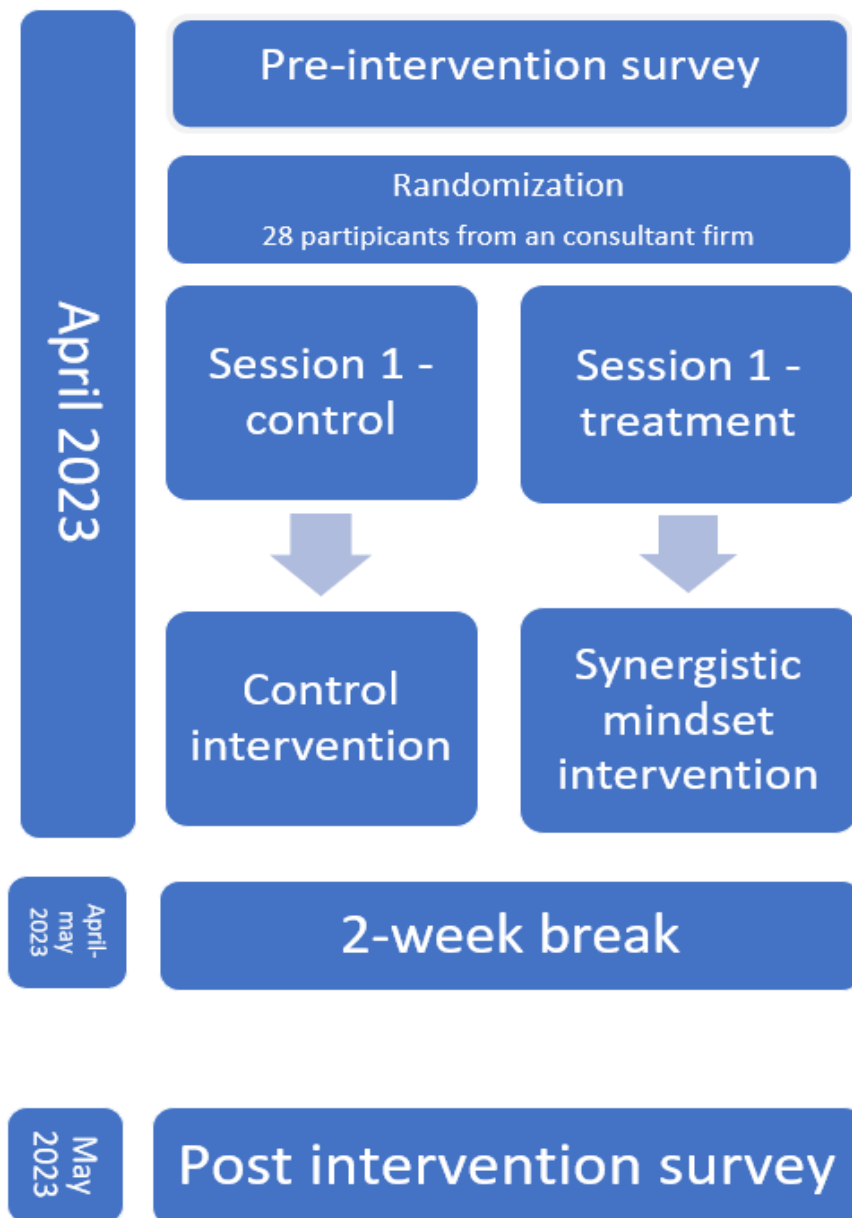


Figure 2: Research Design

3.1 Intervention description

The first part of session 1 was designed to measure the participants' pre-intervention mindset. First, they were asked for some background variables about themselves which included age and gender. Then, on a scale from strongly disagree to strongly agree, the participants were asked three modules of questions. These growth mindset measurements (Bettinger, 2018; Dweck, C. S. 2008), stress-enhancing measurements (Yeager et. al., 2022) and job satisfaction measurements (Nerstad et. al., 2010) are taken from earlier, similar intervention experiments. According to these researchers the questions have been validated as accurate measurements for these mindsets and job satisfaction by numerous studies:

Intelligence questions:

- Our intelligence is something very basic about you that you can't change very much.
- You can learn new things, but you can't really change how intelligent you are.
- You have a certain amount of intelligence, and there is little you can do to change that amount.

Stress questions:

- The effects of stress are good and I should make use of them.
- Stress helps me learn and grow.
- The effects of stress are bad and I should avoid them.
- Stress stops me from learning and growing.

Job-Satisfaction questions:

- I'm bursting with energy in my work.
- I feel energetic and capable when I'm at work.
- I am enthusiastic about my work.
- My work inspires me.
- When I get up in the morning, I feel like going to work.
- I feel happy when I am working intensely.
- I am proud of my work.
- I am immersed in my work.
- I get carried away when I'm working.

Cronbach's alpha

A Cronbach's alpha is a measure of internal consistency of a test or scale and is expressed by a number between 0 and 1. The internal consistency describes to what extent all the items of a test measure the same concept. A higher value gives the results and tests a higher validity (Tavakol and Dennick, 2011).

In table 2 we have Cronbach's alpha for the three groups of questions from the survey.

Table 2: Alpha Measures

Category	Alpha
Growth Mindset	0.964
Stress Mindset	0.845
Job Satisfaction	0.877

Gliem and Gliem (2003) suggest that an Alpha above 0.7 is an acceptable level of internal consistency, over 0.8 is good and over 0.9 is excellent. Most participants in the first survey provided quite consistent responses in all three likert scale question groups; meaning that they were either almost always positive or negative to the theme. The high value alpha coming from the participants being consistent tells us that the measures are perceived clear and understandable, at least if one is positive or negative to the theme of the question group.

The growth mindset items have a high alpha (0,964) which could indicate that these items are highly consistent in what they measure. The small numbers of items in this group would often result in a lower alpha, the high alpha is therefore very positive. The stress mindset group also has a good alpha value (0,845) and are therefore indicating good consistency in the items. This group only consists of four items and the high alpha is therefore a good sign of validity. The job satisfaction group also has a high alpha (0,877) indicating good consistency in the question group.

The alpha of all groups in the survey is higher than 0,8, which indicates that the measurements are good for detecting results after our intervention. However, as the experiment has few participants, it is not sufficient to give any certain conclusions of the effect and value of the intervention.

In the second part of session 1, the participants were randomly assigned to either the control or treatment intervention by the Qualtrics program. As in the intervention from Yeager et. al. (2022), we used a “saying is believing” tactic in both our treatment and control interventions, to motivate the participants to internalize the content. From research by Aronson et. al., (2002); Bettinger et. al., (2018) and Yeager et. al., (2016) it is argued that a “saying is believing” tactic

will boost the internalization of presented information from the interventions. This is argued with three points:

- (1) As they state why the content in the intervention is relevant for them, it becomes even more self-relevant, which further enhances their recallability.
- (2) By self-stating responses in different situations, it can be easier to reenact these responses later.
- (3) If they are asked to use the content to assist someone else, it feels less controlling than being asked to just believe in something themselves. Using it to assist others will also possibly lead to them accepting the information as their truth in the process, via cognitive dissonance processes.

The treatment group received a growth and stress-mindset intervention, which contained information about the brain and how we learn, in addition to how stress reactions function in our body and how to better use these reactions. The structure, content, and visual layout of the treatment intervention was based on the intervention used in Yeager et. al. (2022). There it is used to help American students better handle and use stress reactions, and help them adopt more of a growth mindset.

The treatment participants got two cognitive tasks. First, they received research about neuroscience in the brain's potential to grow and develop. In addition, they also got information on which stress reactions the body has, how they happen in the body, and how they can use and harness these reactions. Second, the “saying is believing” tactic was applied by giving the participant three methods to use what they have learned and asking which ones they have used before. For the ones they have used before, they are asked how they could use these methods again in the future and write an example of how they would have used this in a stressful situation that they have mentioned earlier. If they have not selected it, they are asked if they would be willing to use them, partly or fully in the future, and how they could have used it in a stressful situation, as they have described earlier in the intervention. To create lasting effects, we used supportive psychologies, by making the content memorable, credible, and important. Mostly, we focused on making it memorable by repeating key information and ask them to use it in their own context. The key information being that the brain is a muscle that grows when being challenged, and that the body's stress reactions are a way of preparing and helping the brain to grow and the body to supply what is needed for the challenge. The credibility comes from

quoting a famous researcher and the use of scientists' former work which supports the intervention's content. Lastly, it is important by using “beyond the self motives,” as they are helping improve the intervention for later participants (Yeager et. al., (2022), Bettinger et. al., (2018)).

To convey the relevance of the synergistic mindset to the stressors that the respondents meet, the content of the intervention needs to be adapted (Yeager et. al., 2022). We translated the intervention into Norwegian and modified some of the content to be more applicable to employees by using illustrations from workplace settings. Additionally, we swapped the possible answers on the job satisfaction questions. Instead of going from once a year in increments down to every day, the options were replaced by strongly disagree to strongly agree. We believe this will be easier for the participants to give a more correct and up-to-date answer, partly because it will be hard to measure change in a scale using years, when the period between first and second session only was 2 weeks.

The control group got the same pre intervention mindset measures as the treatment group but was separated afterwards. These participants were given a range of positive habits that would be good for all individuals to implement in their life, though they were mostly mentioned as a tool to improve work performance and wellbeing. After this they were given a “saying is believing” tactic, as in the treatment. They were asked to complement the list of habits and other work tips that could help newcomers in work life and other participants later.

In session 2 all the participants were again given the measurement items from the beginning of session 1. This repeat of survey questions was used to measure the post-treatment growth mindset, stress mindset, and improvements in job satisfaction.

4.0 Sample and procedure

In the first months of 2023 we reached out and invited a couple of firms that matched with our research agenda. Our contacts from the firms received an email containing information with details about the project. We received positive feedback from both firms, and one of them accepted the invitation.

The accepting firm operates in several sectors, among other things health- and career advising. They are located in multiple countries. However, our sample is based solely on employees working in Norway. In Norway they have more than 700 employees, which are located in many parts of the country.

In April 2023, we sent the invitation to the contact person by email, who posted it on the firm's intranet. The post contained practical information, a general explanation of the study (without giving any information that could affect the results), and a link to access Session 1 of the experiment. Both sessions were performed online using the cloud-based software platform Qualtrics. The participants could do the surveys anywhere as long as they had access to the link. When entering the link, they were informed that the experiment aimed to teach how one can increase faith and belief in their abilities and development in the workplace, and how they can help other employees with this in the future. Further, it was emphasized that participation is voluntary and anonymous, and that it would not have any negative consequences should they withdraw from the project. They were also informed that session 1 should take about 35 minutes and session 2 about five minutes. In addition, they received mandatory information about their rights regarding GDPR, and contact information for inquiries. See page NN in appendix NN for a full overview.

A total of 44 employees at a consulting firm in Norway participated in the field experiment. Session 1 includes 44 participants, and the employees were randomly assigned to either the mindset treatment or control condition, after consent was given. 13 participants were assigned to treatment, while 15 were assigned to the control group, as table 3 demonstrates. The last 16 employees were not assigned to either group, because they either never began the survey, and did not want to participate, or opened it and then forgot about it through the workday. Session 2 includes 10 of the participants that took part in the first session, where 6 was in the control group and 4 were in the treatment group. All participants who started session 2 answered all questions.

Table 3: Compliance

	Session 1		Session 2	
	Started	Completed	Started	Completed
Control	15	15	6	6
Treatment	13	13	4	4
Not assigned	16	0	0	0
Total	44	28	10	10

Note: The columns show the number of participants who started and completed each session.

All questions were answered by participants that took part in both sessions. Since all participants who started the intervention found it interesting enough or short enough to complete, we have not constructed an attrition table. The compliance for control was 40% and for treatment it was 31%. However, including all that opened the invitation link only 23% finished. The 9% difference in compliance could have meant that the control intervention might be more interesting or just shorter than the treatment. Also, the low percentage of compliance might also indicate that only those who found the intervention interesting or agreed with the information returned for the second session. Based on the numbers we conclude that the data we have collected in this experiment is not a valid representation, as the sample is too insignificant.

5.0 Results

In this chapter we will present the results of our collected data. We emphasize that the sample size is small and should be considered with high caution while interpreting the results. Our results include a balance test, correlation tables, and a regression with robust standard errors. This is followed by a section where we connect the results to our research questions.

Table 4 presents our balance test and descriptive data. Growth mindset, stress mindset and job satisfaction are standardized variables with mean zero and standard deviation using the data collected from individuals that participated in both sessions. Mindset measures and job satisfaction is the mean of all related questions in chapter 6. In order to ensure meaningful comparison and interpretation of the responses, it was necessary to reverse the scores of certain negatively worded questions. By doing this, a positive score would give the same interpretation on growth mindset, stress mindset and job satisfaction. The age variable represents the average age and standard deviation in treatment and control groups. Average age in the groups differ

slightly from each other. The gender variable represents the average gender, and participants could select “male,” “female,” or “other/do not want to state.” Since none answered the latter, we created a dummy variable where male equals to 1 and female equals to 0. We observe that there is equal representation of gender in the control group, while there is only one male and three females in the treatment group. In the table we find that none of the covariates are significant in differences between the groups, and so they are well balanced across treatment.

Table 4: Balance test

Covariate	Treatment Mean	Control Mean	T-Statistic	P-Value
Growth Mindset	-0.059	0.039	-0.152	0.883
Stress Mindset	-0.174	0.116	-0.488	0.639
Job Satisfaction	0.389	-0.259	1.227	0.267
Age	-0.038	0.026	-0.099	0.924
Male	0.250	0.500	-0.745	0.480
N	4	6	10	10

Note: the columns provide the mean for treatment and control, and t-statistics for the sample. The variables are standardized except for the “male” variable.

Table 5 represents a correlation matrix of the pre-mindset measures. We observe a weak positive correlation between growth mindset and stress mindset. This suggests that a higher growth mindset is associated with a higher stress mindset.

We also find a small negative correlation between both pre-mindsets measures and job satisfaction. Therefore, it might be that job satisfaction will be affected negatively by our intervention. This is unexpected, as we theorized that both a better growth mindset and a better stress mindset would result in better job satisfaction. None of the correlations are significant, and we conclude that our results are not a valid representation as the sample in our experiment is too small to make a meaningful conclusion out of the data.

Table 5: Correlation between Pre-Mindset measure

	Growth Mindset	Stress Mindset	Job Satisfaction
Growth Mindset			
Stress Mindset	0.111		
Job Satisfaction	-0.102	-0.043	

Notes: *p<0.10, **p<0.05, ***p<0.01. Session 1 sample (n=28)

Table 6 presents predictors of baseline measures performing independent regressions against control variables, Age and Male (gender), using the sample from session 1. All variables except gender are standardized with mean zero. A negative value in “Male” indicates higher score from females in the survey, and positive values indicate higher scores from men. In the “Age” variable a positive value implies that age improves the score in that category in the survey, and a lower score means that a lower age increases the score.

The data from this table suggests that females have slightly more of a growth mindset (-0.165), and males have a much higher stress enhancing mindset (0.668), and slightly higher job satisfaction (0.149). Further, age is slightly positive for the growth mindset (0.052) and job satisfaction (0.205) measures, but is negative for the stress mindset measure (-0.152). However, as none of these data are significant and the adjusted R squared is low or even negative, these independent variables are not important for the result of the intervention. However, as our observations are quite low (N=28) it is not possible for us to conclude anything out of these data.

Table 6: Predictors of baseline Growth Mindset and Stress Mindset

	<i>Dependent variable:</i>		
	Growth Mindset (1)	Stress Mindset (2)	Job Satisfaction (3)
Male	-0.165 (0.424)	0.668 (0.403)	0.149 (0.415)
Age	0.072 (0.199)	-0.152 (0.188)	0.205 (0.194)
Constant	0.052 (0.238)	-0.213 (0.226)	-0.050 (0.233)
Observations	28	28	28
R ²	0.010	0.109	0.053
Adjusted R ²	-0.070	0.037	-0.022
Residual Std. Error (df = 25)	1.034	0.981	1.011
F Statistic (df = 2; 25)	0.121	1.524	0.704

Note: *p<0,10, **p<0,05, ***p<0,01. All variables are standardized with mean 0 and standard deviation of 1.

In Table 7 we investigate treatment effects for each mindset, as well as job satisfaction.

After receiving the answers to the second survey we have performed a regression analysis where we have used the means of the responses from the second survey in each of the three item groups. The treatment and age variables are dummy variables, and all the others are standardized with a mean of zero. The three baseline independent variables are the standardized means of the data in the first survey.

We can see from column 1 that there is a good effect of treatment on growth mindset, as treatment increases the score by 33% of a standard deviation. It is however not significant which indicates that there is not enough evidence in our sample to imply that a non-zero correlation exists. In column 2 we see that our findings are robust when we control for the pre-intervention variables and baseline growth mindset scores. Both age and the baseline growth mindset are highly significant in explaining the treatment effect, age affecting it negatively and the baseline growth mindset highly positive. High R^2 in column 2 means that most of the effect is explained by our independent variables.

In column 3 we find that there is also a decent effect from the treatment on stress mindset where the score is improved by about 20% of a standard deviation. Here the results are again not significant, and we therefore cannot imply a non-zero correlation. From column 4 we find that the effect of treatment is increased to 41% when considering our independent variables. Here, the baseline stress mindset value is high and significant, indicating that the mindset before the intervention has a high impact on the treatment effect. The high increase in treatment effect could come from our sample already having a baseline stress mindset that is more well suited for improvement compared to the overall population.

In column 5 we see a large effect from the treatment on job satisfaction, where the score is improved by 116% and significant. Our sample is however quite minimal and so we still cannot conclude anything on the wider population from these data. After adding the pre-intervention variables and baseline job satisfaction, we still find an improvement of 98% on treatment, and it remains significant. Different from the other two dependent variables the baseline job satisfaction is not high or significant in explanation of this high treatment effect. Age however has a decent amount of effect and is also significant, indicating that the older employees get a better effect on job satisfaction from the treatment.

Table 7: Robust Standard Regression

	Dependent variable:					
	Growth Mindset		Stress Mindset		Job Satisfaction	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.334 (0.674)	0.312 (0.231)	0.195 (0.681)	0.405 (0.446)	1.158* (0.549)	0.977* (0.403)
Age		-0.211** (0.075)		0.086 (0.152)		0.326* (0.141)
Male		-0.335 (0.238)		-0.274 (0.466)		-0.040 (0.464)
Baseline Growth Mindset		0.859*** (0.121)				
Baseline Stress Mindset				0.910** (0.240)		
Baseline Job Satisfaction						0.316 (0.268)
Constant	-0.133 (0.427)	-0.059 (0.190)	-0.078 (0.431)	-0.269 (0.354)	-0.463 (0.347)	-0.531 (0.324)
Observations	10	10	10	10	10	10
R ²	0.030	0.934	0.010	0.754	0.358	0.814
Adjusted R ²	-0.092	0.881	-0.114	0.556	0.277	0.665
Residual Std. Error	1.045 (df = 8)	0.344 (df = 5)	1.055 (df = 8)	0.666 (df = 5)	0.850 (df = 8)	0.579 (df = 5)
F Statistic	0.245 (df = 1; 8)	17.711*** (df = 4; 5)	0.082 (df = 1; 8)	3.822* (df = 4; 5)	4.455* (df = 1; 8)	5.459** (df = 4; 5)

Note: Each column presents a separate ordinary least squares (OLS) regression and reports the estimated coefficient (and robust standard error) for all included covariates. *p<0.1; **p<0.05; ***p<0.01. All variables are standardized with mean 0 and standard deviation of 1.

We have conducted diagnostics on the regression model. We could check for outliers, multicollinearity, and residuals. However, since the sample is already very inadequate, we did not find it reasonable to check for outliers and residuals. However, we have tested for multicollinearity in regressions that includes multiple explanatory variables, which is the case for model (2), (4), and (6). Multicollinearity may be caused by strong correlation between explanatory variables, and we observe that there are relatively strong R²'s in these models with a few significant values, which could be a sign of multicollinearity. A VIF-test can identify multicollinearity, where VIF (>5) indicates potential multicollinearity, and VIF (>10) indicates almost certain multicollinearity (Alauddin, 2010). Our VIF-test shows values between one and two on all variables in all three models, which must be considered as satisfying results. However, as with all our results, these values must also be interpreted with caution because of the small sample size.

5.1 Research question 1 - Growth mindset

“Can a synergistic mindsets intervention increase employees' belief in their abilities and learning?”

In table 7, growth mindset has been regressed on the treatment status and controlled for age, gender, and the baseline growth mindset. The treatment induced by the intervention has had a decent positive effect on growth mindset. As we presented in literature review, there is substantial evidence that supports growth mindset interventions. Our findings are positive and in line with theory and other intervention experiments done in different contexts such as in Bettinger et. al., (2018), Dweck, 2006 and Yeager et. al., (2022). After controlling for gender, age, and the baseline growth mindset we see a positive effect from treatment, which is robust. When controlling for these factors we also have a good R squared value which indicates that the independent variables explain most of the variability in the new growth mindset. The sample is limited, however, and so the R squared does not provide a complete picture of the model's goodness of fit or the predictive power.

5.2 Research question 2 - Stress mindset

“Can a synergistic mindsets intervention shape an employee's mindsets regarding stress management?”

From our main regression in table 7 we have also performed a regression on the treatment effect on stress-enhancing mindset and again controlled for age, gender, and the baseline stress-enhancing mindset. We see a decent positive effect from the treatment before adding the control variables, and an even greater positive effect after controlling for them. The baseline stress mindset variable seems to be the explaining factor for this significant increase in treatment effect after control. The R squared value is moderately high and indicates a decent goodness of fit for the model, however, the adjusted R squared is substantially lower which could indicate that the fit is heavily influenced by the number of predictors and our sample size.

5.3 Research question 3 - Job satisfaction

“Will an increase in growth mindset and/or stress mindset increase job satisfaction?”

In the job satisfaction regression, we did find significant large positive results on treatment, both before and after controlling for the other independent variables. This indicates that the treatment, which was supposed to increase belief in a growth and stress mindset, did increase job satisfaction in our sample. The baseline job satisfaction was not significant in its regression, in contrast to the other regressions, though age seems to be somewhat significant in explaining the treatment effect. This aligns with our research question and could be linked to what we theorized in the theory section. The data also supports the existing literature which indicated that increased age resulted in higher job satisfaction. However, this was not a factor that we actively sought to examine. The difference in R squared and adjusted R squared is moderate and has a noticeable impact on the model's goodness of fit when considering the numbers of predictors and sample size.

6.0 Discussion

The data yield positive results on all variables of the experiment, which indicate that this is a subject that should be further tested in greater populations. However, we cannot make any meaningful conclusion on the larger population out of our data, because of the insufficient sample size.

The results we get in our intervention experiment points to improved growth and stress mindset, and especially increased job satisfaction in the participants. Thereby, all three research questions have a positive answer. Due to issues with the sample, we cannot make any conclusions about the effectiveness of the treatment intervention. We do however argue that the intervention has shown potential and should be further tested and developed. In the future the experiment should be performed with a larger, representative sample which can lead to valid results; further improve the synergetic mindset intervention in terms of design, content, and structure; and to investigate if the increase in job satisfaction leads to better performance in the workplace.

This intervention is both time efficient and cost-effective, given that it produces the effect we find and the increased production we have theorized that this will lead to. Increasing job satisfaction can help organizations retain employees and their skills, and consequently reduce recruitment and training costs. We theorize that better job satisfaction, in synergy with retaining skills, enhances performance of organizations.

The intervention data could have been improved if we had managed to gather a larger sample, both by increasing the numbers of asked participants, and by better motivating and increasing compliance in those that did participate. As a result of few participants, we were not able to perform any meaningful conclusions with the data other than showing indications of effect.

More resources could have given us a chance to deliver greater incentives to increase participation by direct monetary rewards. In addition, we did not have a continuous direct link to reach the employees/participants with follow up information and reminders as the intervention was released as a link on private servers within the company. The participant was reached through email, and so we could not answer questions or motivate further in face-to-face meetings. We also suspect that the invitation to session two arrived in a “spam folder” in many of the participants' inboxes. As a result, some participants were unaware of their invitation, and missed out on the second session. The intervention was also a voluntary exercise for each of the employees, it was not mandatory and was unpaid work, which could spark disinterest in participation.

7.0 Conclusion

In this pilot study we developed a synergetic mindsets intervention containing growth and stress mindset treatment, which we theorized would lead to higher job satisfaction. The intervention was based on previous work from Yeager et. al. (2022), which also sought to affect growth and stress mindset. However, our intervention was modified to fit the context of employees in a company.

First, the participants answered on a likert scale survey to measure their current mindset values, and then immediately after went through our intervention. After 2 weeks they again received the survey they answered in the start, so that we could measure the change after some adjustment time.

The analysis demonstrated that all three factors have increased after treatment, especially job satisfaction. Even though our results are mostly not significant, and our sample is too small to make any conclusion on the effect in the wider population, job satisfaction has been significant

and highly affected by the treatment. These results indicate that it might be insightful to research further on whether a synergetic mindset intervention could increase job satisfaction.

We conclude that more research is needed in this population as we there could be significant gains for firms to collect. This intervention is time efficient and cost-effective for organizations to use, assuming it does give the effect we find and the increased production we have theorized that this will lead to.

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