

Candidate: 10075

Growing with the flow

Exploring the link between mindset, flow, and gender

Bachelor's thesis in PSY2900
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PREFACE

This paper was part of a research project focusing on the relationship between the factors perseverance, passion, growth mindset, and flow.

The data used was gathered for the purpose of this project, collected by my fellow students and I under the supervision of Hermundur Sigmundsson. The research literature implemented was found on Oria, PubMed, and Google Scholar, by me. Through reading different papers on growth mindset and flow, this study got its ideas to investigate the two variables. After discussions with the supervisor, adding diversification in terms of gender was decided. The choice of methods of analysis was discussed briefly with my supervisor to ensure correctness, and data analysis was performed and interpreted personally.

A special thanks goes out to my girlfriend, my mother, and my brother for great feedback and proofreading, and to my father for his support. And a big thank you to my supervisor Hermundur who helped me hold onto the “red thread”, and for his valuable feedback and insight.

With this, I declare this paper as my own.

ABSTRACT

This thesis investigates the connection between mindset, flow, and gender, with a focus on their significance for enhancing well-being and performance. With a quantitative approach, the study examines the individual's belief in the malleability of intelligence (growth mindset) and the state of hyper-focused engagement (flow). The sample comprises 671 students, including 275 males, 375 females, and one unspecified respondent. To measure the variables of interest, three scales were employed: the Theories of Intelligence Scale (TIS) for growth mindset, the General Flow Proneness Scale for flow, and a newly developed additional growth mindset scale. The findings reveal a moderate positive correlation between growth mindset and flow across all scales. Furthermore, a weak positive correlation between growth mindset and flow is observed for females across all scales, while a moderate positive correlation is evident for males when using the growth mindset scale. However, the correlation is not significant when employing the Theories of Intelligence Scale for males. This study contributes to the field of positive psychology by exploring the relationship between growth mindset and flow, which are instrumental in fostering motivation, enhancing performance, and promoting overall well-being. By shedding light on these interconnections, this research hopefully provides valuable insights for practitioners and scholars seeking to enhance psychological factors that contribute to positive outcomes in various domains.

Keywords: Growth mindset, flow, gender, well-being

Growing with the flow:

Exploring the link between mindset, flow, and gender

The sensation of *flow* is being fully engaged and in control of a task, where one's skills and abilities are in compatibility with the challenge at hand (Csikszentmihalyi, 1990). By achieving flow, one might feel fulfillment, or a sense of pride. Some people seem to achieve such a sensation more often than others. This leads to the focus of interest of this paper. What enables someone to attain the sensation more frequently? Why is *mindset* of importance, and what is the connection between growth mindset and experiencing flow? Additionally, how does gender relate to this? Growth mindset refers to the belief that one's skills and intelligence can be developed through hard work, dedication, and practice (Dweck & Yeager, 2019), while flow refers to the state of complete absorption and enjoyment in a challenging task or activity (Csikszentmihalyi, 1990). Both these terms are thought of as important factors for personal and professional growth, and simultaneously bound to positive outcomes such as motivation, increased performance, and well-being (Csikszentmihalyi, 1990; Dweck, 2007b; Ilies et al., 2017).

The concept of a growth mindset was first introduced by Carol Dweck in 1988. But already in 1486, philosopher Giovanni Pico della Mirandola claimed humans were the sole species to have the ability and potential to make themselves into what they wanted to be (Pico Della Mirandola, 1486/2012), effectively suggesting the idea that intelligence is malleable (Dweck & Yeager, 2019). Dweck discovered that people who believe that their abilities can be developed through hard work and dedication tend to excel and achieve more than people who believe their abilities are not. Endorsing a growth mindset fosters resilience, perseverance, and a

willingness to learn from failure (Dweck & Yeager, 2019). Since its bursting onto the scene of psychology, the idea has been applied to fields such as education and work, to increase motivation and performance.

Similarly, the concept of flow has been studied to a great extent (Csikszentmihalyi & Csikszentmihalyi, 1988). It depicts the psychological mental state one can experience when completely immersed in a task or activity (Bonaiuto et al., 2016). Psychologist Mihaly Csikszentmihalyi suggests that individuals who experience flow on a regular basis tend to report augmented levels of satisfaction, enjoyment, and performance (Csikszentmihalyi, 1990) - making further understanding of flow essential for improving quality of life (Csikszentmihalyi et al., 2005).

Although both growth mindset and flow individually have been studied rigorously, only a few studies have researched the relationship between the two (Caniëls et al., 2021; Tan et al., 2021), with mixed results. Therefore, a consolidated consensus on whether possessing a growth mindset facilitates experiencing flow or whether experiencing flow can promote development for a growth mindset, is yet to be established. Due to the belief that these factors are critical for personal and professional growth, understanding the relationship between the two constructs is deemed significant. By exploring this link, we can gain deeper understanding of how to promote a more optimal way of experiencing life.

In summation, this study aims to contribute to the existing literature on growth mindset and flow by exploring the relationship between these two constructs, additionally taking gender into account. I hope to identify a potential relationship between growth mindset and flow and give insight into how this can be adapted to promote well-being and motivation.

Theoretical framework

To accentuate the paper's understanding of the terms mindset and flow, these will be elaborated on to avoid misunderstandings. Additional information on previous tendencies shown in relation to gender are also mentioned. A definition of mindset will be established, followed by a definition of flow, ending with how the two might be connected, before further elaboration on the methodological strategies in the next chapter.

Mindset

Mindset is the way one thinks of attributes and abilities in oneself (Dweck, 2014). In 2000, Carol Dweck and colleagues proposed two different types of mindsets to easier categorize: growth and fixed mindsets. Growth mindset refers to the belief that intellectual skills and intelligence can be developed and are malleable (Bazalais et al., 2018; Yeager & Dweck, 2020). Even though people are born completely different – in regards to predisposed skills, inclinations, interests, and temperament (Dweck, 2007b) - people with a growth mindset believe that their talents and skills can be developed and enhanced through effort, good mentoring and using appropriate effective strategies (Dweck, 2014). This type of mindset stands in contrast to a fixed mindset. Having a fixed mindset refers to the belief that intellectual skills and intelligence cannot be developed (Yeager & Dweck, 2020). Individuals with fixed mindsets think that their talents and skills are something they are born with, predetermined and limited, and they focus more on proving their abilities rather than developing them, resulting in avoiding challenges which might leave them feeling dumb. Fixed mindset individuals are also more easily derailed by setbacks and subsequently believe that these setbacks mean they lack the necessary skills (Dweck, 2014). According to Dweck (2007) every situation encountered would be evaluated with questions such

as “Will I fail, or will I succeed?” “Will I seem smart or stupid?” or “will I feel like a winner or like a loser?”. All situations seem to ask for confirmation on these people’s intelligence or abilities (Dweck, 2007b).

Studies on growth mindset

A study conducted in Columbia University showed that even people’s brain waves could provide information on what kind of mindset they had (Dweck, 2007b). The study tested people with difficult questions and gave them feedback while their electrical brain waves were monitored to see if they were interested and were paying attention. Only those with a growth mindset paid close attention to new information which could enhance their knowledge – and only they prioritized learning (Dweck, 2007b). Individuals with a growth mindset are more likely to engage in new challenges, be more persistent when experiencing setbacks, and view failure as an opportunity to learn and grow. Taking more risks and seeking feedback to better their own performance is also normal behavior for someone with a growth mindset. Furthermore, they tend to be more resilient and can adapt when met with changes or difficulties in the task at hand (Dweck, 2014; Dweck, 2007b; Yeager & Dweck, 2020).

A study by Limeri et al. (2020) discovered a trend in students who persistently struggled in a college course, shifting their view on mindset from it being malleable to it being a fixed mindset. Limeri and colleagues’ findings constitute a positive feedback loop where positive feedback (mastery in a college course) resulted in a trend towards a stronger growth mindset and weaker fixed mindset, and negative feedback (ineptness in a college course) resulted in a trend towards a stronger fixed mindset and weaker growth mindset. This response adaptiveness suggests mindset contagion, as King (2020) writes. In his article he stipulates the role peers have

in shaping fixed or growth mindsets, though still being relatively under-explored. The implications of this however, indicate that individuals could be trained to progress from a fixed mindset toward a growth mindset (Krskova & Breyer, 2023). A process which can be initiated by mindset interventions (Nallapothula et al., 2020; Paunesku et al., 2015; Yeager et al., 2019). By which studies from Sigmundsson et al. (2020) and Sigmundsson et al. (2021) demonstrate that females tend to endorse a growth mindset more than males.

Although growth mindset is generally considered favorable to fixed mindset as the latter is seen as maladaptive and less beneficial in different contexts, studies have shown contradictory results for their importance in achievement - suggesting that growth mindset is not a valid predictor in motivational and achievement outcomes. Many studies have found growth mindset to influence academic performance, motivation, self-regulation, and other positive outcomes (Burnette et al., 2013; Claro et al., 2016; Dweck, 2007a; Paunesku et al., 2015; Yeager et al., 2019). Yet, there have been studies where results have shown mixed or inconsistent results (Rammstedt et al., 2022). Studies by Aronson et al. (2002) and Bahník and Vranka (2017) found negative relationships between growth mindset and achievement in school. (Furnham et al., 2003) found no significant correlation between mindset and performance. And regarding persistence and mindset, Macnamara and Rupani (2017) did not find a significant relationship either. A meta-analysis study (Sisk et al., 2018) showed that out of 273 effect sizes only 100 effect sizes (37%) were significantly different from zero and positive, implying a positive association with academic achievement. 16 effect sizes were significantly different from zero but negative, meaning growth mindset was associated with worse academic achievement, with the remaining results being non-significant (Sisk et al., 2018).

However, studies have shown promising results on growth mindset interventions in children with a below average grade improving academic achievement (Yeager et al., 2019). This is supported by results from a study done in Chile, by Claro et al. (2016), which suggests that students endorsing a growth mindset outperform their fixed mindset peers and are more likely to enjoy higher academic achievement. In addition, a significant portion of the literature speaks in favor of growth mindset's positive consequences, which are not confined to learning-related or academic outcomes (King & Trinidad, 2021). For instance, a study by King (2017) showed that mindset is key in influencing subjective well-being. Results which are supported by Nalipay et al. (2022) where a study on teachers holding a growth mindset predicted well-being. Furthermore, a study by Xu et al. (2021) showed that having a growth mindset lowers perceived cognitive load and improves learning. This suggests that less stress and anxiety might be experienced when faced with challenges (Caniëls et al., 2021). In Burnette et al. (2020), growth mindset is also shown to have implications on mental-health outcomes, being negatively correlated with psychological distress and positively correlated with active coping. Which is similarly reported in Tao et al. (2022). Demonstrating the abundance of studies supporting the positive effects of endorsing this mindset.

Work and growth mindset

The exploration of a growth mindset has also reached business settings. In a study by Kouzes and Posner, it was found that greater leadership was exhibited by growth mindset managers compared to fixed mindset managers. Forming a growth mindset has been linked to better fiscal management, opportunities for career development (Krskova & Breyer, 2023), and work-engagement (Lin, 2021). A study from Visser (2013) showed that growth mindset predicts

work engagement, and that together they predict performance. Further, according to Kondratowicz and Godlewska-Werner (2022), it can positively affect life and job satisfaction - while also reducing the risk of burnout (Lin, 2021) – manifesting its high quantity of advantages.

Locus of control and growth mindset

In this section I will explore the intersection of growth mindset and the concept of Locus of control (LoC), and their collective link to flow.

Locus of control is the idea that one is either in control of the results of their actions or not, differentiating between an internal and external locus of control (Tan et al., 2021). Both growth mindset and LoC revolve around an individual's perceptions of their skills and abilities, particularly in the face of challenges. These concepts are intertwined in how they shape a person's motivation and behavior (Nallapothula et al., 2020). Essentially, an internal locus of control aligns with a growth mindset, while an external locus of control reflects a fixed mindset.

The difference between mindset and LoC is that LoC impacts an individual's perception of the situational variables required to achieve, and mindset is about an individual's perceived innate ability to achieve (Nallapothula et al., 2020). In other words, LoC determines outcome expectations whereas mindset determines an individual's belief to overcome. Interestingly, Nallapothula et al. (2020) suggest that an individual has a combination of the two. Further evidence supports this overlap, demonstrating that individuals with a growth mindset have an internal locus of control about their skills (Ommundsen et al., 2005). Those with a fixed mindset, in contrast, tend to feel they have less control over their academic outcomes.

Moreover, studies by Mikicin (2007), Mosing et al. (2012), and Taylor et al. (2006) have linked an internal LoC to increased flow proneness. Due to LoC being connected to mindset theory, these findings suggest a potential link between growth mindset and flow. Perchance that growth mindset may cultivate flow.

Flow

Flow refers to, as mentioned above, the feeling of being completely absorbed by a task or activity which challenges one to exercise one's full potential. Experiencing flow produces a positive sensation in the completion of an activity (Csikszentmihalyi & Csikszentmihalyi, 1988). Flow has also been associated with outcomes such as happiness, increased motivation, and performance (Asakawa, 2010; Ilies et al., 2017; Lee, 2005; Mikicin, 2007; Zito et al., 2019). In the following, the state of flow is described, and later related to its occurrence during leisure and work.

The concept of flow was first developed by psychologist Mihaly Csikszentmihalyi in the 70s and has since been studied and used in domains such as sports, arts, and work (Csikszentmihalyi & LeFevre, 1989). According to Deci et al. (1999), flow is a state characterized by high intrinsic motivation – pleasure and satisfaction derived from the engagement in the activity and not external goals – which provides a strong incentive for developing skills. Csikszentmihalyi (1990) takes usage of the term “optimal experience” as a description of the flow state. He further elaborates that an optimal experience does not happen when a person is relaxed or passive, but rather when an individual's body or mind is taken to its limits to overcome, or complete, a task or activity. This could be described as “being in the zone” colloquially. One experiences low self-awareness, action-awareness merging, and time

perception may change drastically during the activity (Csikszentmihalyi, 1990). The individual is sure of how to complete the task and exudes control over said task.

This is, however, something which may change when personal skills outweigh the perceived challenges. When a task becomes too easy it transforms into boredom or a more relaxed state (Csikszentmihalyi, 1990). On the other hand, when the challenge perceived is greater than one's skills, it is likely to result in frustration or anxiety during the activity. Therefore, it is regarded as crucial to find the optimal balance in the dynamic process between challenge and skill (Elnes & Sigmundsson, 2023). Optimal balance is easier to find for people with a higher flow proneness. When people with a high flow proneness face a difficult challenge, they feel less stressed and enjoy it more than someone with a lower flow proneness (Asakawa, 2004). Interestingly, in a study on gender differences in flow state, Yang and Quadir (2018) found that females had significantly higher mean scores for flow in comparison to males.

Facilitation of flow and its aftermath

A person capable of experiencing flow “as often as possible”, will see an improvement in the quality of life (Csikszentmihalyi, 1990). Csikszentmihalyi (1990, p. 4) describes the aftereffects of flow as feeling “more together than before, not only internally but also with respect to other people and the world in general.”. He adds that a person feels more “capable and skilled” as a result of experiencing a flow state. In Elnes and Sigmundsson (2023), a roundup of studies show flow to be positively related to factors such as well-being (Asakawa, 2004; Rijavec et al., 2016), intrinsic motivation (Jackson et al., 1998), life satisfaction (Asakawa, 2010), learning (Furlong et al., 2014), and negatively related to procrastination (Lee, 2005), anxiety

(Asakawa, 2010), and burnout (Rijavec et al., 2016). Through facilitation of flow, one could expect a more enriching and mastery-filled life.

According to Csikszentmihalyi (1990) there are numerous ways to facilitate the experience of flow, from which research has suggested three conditions of key importance (Csikszentmihalyi et al., 2005). Flow tends to happen when there is a clear set of goals in the activity, a balance between perceived challenges and perceived skills, and clear and immediate feedback to inform the individual of how he or she is progressing. To experience flow, one effective method is to take control of the body's capabilities and engage in activities such as sports, sex, dance, yoga, reading, or music, which can lead to positive experiences and enjoyment (Csikszentmihalyi, 1990). It is crucial to develop the necessary skills to utilize the body and to find delight in doing so, as the more enjoyable the activity, the more likely it is to induce a flow state (Csikszentmihalyi, 1990).

Flow in leisure and at work

Flow has been extensively studied in recreational activities such as playing sports, dancing, playing music, or chess (Zito et al., 2016), but research has shown that it also occurs frequently in work activities (Bakker, 2008; Csikszentmihalyi & LeFevre, 1989). In fact, in Csikszentmihalyi and LeFevre (1989), it was found that flow experience happened at work three times more often than in leisure. Highlighting the importance of work in our daily life. The feeling of using one's skills in a challenging situation seemed to occur more frequently at work due to the balance between task and skill, which was lacking during leisure (Csikszentmihalyi & LeFevre, 1989). This could be dependent on the type of profession or the opportunities given by the employer regarding the balance (Zito et al., 2016), or on job resources (Zito et al., 2019).

Newer studies have investigated flow based on the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Sharma et al., 2020; Zito et al., 2019). The JD-R model is a theoretical framework used to understand how factors impact employee well-being and performance (Bakker & Demerouti, 2007). Job demands refer to the tasks, activities, and effort a job requires, while job resources refer to physical, psychological, social, and organizational aspects that assist individuals reduce job demands, achieve goals, and stimulate growth, learning, and development (Demerouti et al., 2001). Job resources have been shown to have a positive contribution to the performance and engagement of individuals (Bakker, 2008), in addition to enabling employees cope with job demands better, with resources such as self-development opportunities and performance feedback. These types of resources positively influence the challenge-skill balance by enabling people to achieve their targets and promote the flow experience (Zito et al., 2016).

Connecting growth mindset and flow

A growth mindset involves actively seeking out new challenges and learning new skills, which in turn promotes greater skill development and learning. Endorsing a growth mindset is thought to be a factor in facilitating the flow state (Tan et al., 2021), which occurs when an individual's skills are in harmony with the task's level of challenge. Such experiences of flow can promote well-being and motivation, finally leading to a more fulfilling life (Ilies et al., 2017). For example, Zito et al. (2019) found flow to have a positive association with positive emotions. Similarly, Nalipay et al. (2022) found growth mindset to have a positive correlation with well-being. Still, only two studies have investigated growth mindset and flow together (Caniëls et al., 2021; Tan et al., 2021). Finding enjoyment in personal pursuits is a vital

component of a meaningful life, and this paper aims to explore the connection between growth mindset and flow, which could be critical factors for enhancing the quality of life for individuals.

Thesis

The aim of this study is to investigate whether having a growth mindset may be related to flow in a sample of Norwegian citizens, and additionally to investigate the potential role of gender. Growth mindset and flow have been seen as important for motivation, performance, and well-being (Csikszentmihalyi & LeFevre, 1989; Dweck, 2000; King, 2017; Kondratowicz & Godlewska-Werner, 2022; Lee et al., 2023). The relationship *between* these factors has, however, hardly been studied. As the focal point of this article is to explore this association, a main and an additional hypothesis have been developed based on the reviewed literature:

Main hypothesis: There is a statistically significant positive association between growth mindset and flow.

Additional hypothesis: It is predicted that a statistically significant positive correlation between growth mindset and flow will be observed for both males and females.

Methodology

This article uses a quantitative method and questionnaire. By using a quantitative research method the goal is to research phenomena from a limited amount of information about a large number of cases, in contrast to in depth, as in qualitative methodology (Ragin & Amoroso, 2019). The thesis's focus on the variables mindset and flow underlines the need for a questionnaire as this develops the foundation to get an overview on a greater sample of individuals. A quantitative method enables the researcher to explore a wide array of statistical analysis, and to spot trends more easily in the collected data.

Sample

The data set for this study included 671 respondents, aged between 16 and 85 years old ($M = 30.02$, $SD = 13.41$). The data provided was precleaned and ready to use. The sample consisted of 395 females (59%) and 275 males (41%); 1 participant (<1%) did not specify their gender. The average age for females was $M = 28.66$ ($SD = 12.41$), and for males slightly higher at, $M = 31.99$ ($SD = 14.54$).

Procedure

The data was gathered through a convenience sample. Meaning that the participants recruited were mostly family, friends, fellow students on campus, and acquaintances on social media. The respondents were informed of the goal of the study and assured of their anonymity in their participation. Further, they were informed that there are no right or wrong answers. Participation could be withdrawn at any time, and no rewards were offered to those who participated. The data was collected by the bachelor group, including myself.

Regarding the ethical policies, there was not gathered any sensitive personal information. The questions were not of a sensitive nature. There were questions about age, gender, highest completed level of education, and if the participant is passionate about something, none of which were obligatory to answer. Due to this there was no need to apply for acceptance from REK or NSD.

Instruments

The questionnaire was a combination of scales assessing five variables: Grit S scale (8-items, Duckworth & Quinn, 2009), Passion: Passion test (8-items scale, Sigmundsson et al. 2020), Perseverance: (10 items scale, Sigmundsson & Dybendal, in preparation), Mindset: TIS scale (8-items, Dweck, 1999), Growth mindset: (8 items scale, Sigmundsson & Dybendal, in preparation) and Flow test (Elnes & Sigmundsson, 2023). Grit S measures a person's perseverance and passion. Passion measures a person's strongness of feelings toward something. Mindset measures a person's belief of whether the brain is malleable or not. Flow measures a person's proneness to the dynamic state – flow.

In this project only the scales measuring mindset and flow were assessed. However, mindset is measured in both Dweck's (1999) and Sigmundsson and Dybendal's (in preparation) scales. Both scales are assessed against flow to explore any differences between the two scales in relation to the flow scale.

TIS scale

Dweck's Theories of Intelligence Scale (1999), consisting of 8 items assessing fixed and growth mindset, was measured via a Norwegian translation of the scale (Bråten & Strømsø, 2004). Out of the 8 items, 4 were statements on fixed mindset, such as "*Your intelligence is not something you can change particularly*" or "*You have a fixed amount of intelligence, and you*

can't really do much to change it". The other 4 statements were regarding growth mindset, such as "*Whoever you are, you can change your intelligence level considerably*" or "*Even your basic intelligence level can be changed considerably*". The questions were operationalized on a Likert-scale containing 6 response alternatives ranging from (1) *strongly agree* to (6) *strongly disagree*. Items regarding growth mindset were reversed for a high score to mean an increase in growth mindset. Research has shown the scale to have good internal consistency, meaning that the items used in the scale correlate with each other highly, which indicates reliability. For the 8-item scale, Cronbach's alpha was high, $\alpha = 0.93$ (Midkiff et al., 2018). Reliability data from Dweck et al. (1995) showed Cronbach's alpha of $\alpha = 0.85$, and test-retest reliability after two weeks of $r = .80$. For this study Cronbach's alpha was higher with a value of .92.

Growth mindset scale

Sigmundsson and Dybendal's (in preparation) growth mindset scale contains 8 items and is based on mindset theory from Dweck and Leggett (1988). It is focused on a growth mindset, and a lower score reflects a tendency toward a fixed mindset (Sigmundsson & Dybendal, in preparation). Equal to Dweck's scale, it contains 8 statements. Different to Dweck's scale, instead of 4 items, all 8 items are for measuring growth mindset. The statements are modified slightly, and the Likert-scale consists of 5 response alternatives ranging from (1) *strongly disagree* to (5) *strongly agree*. Statements were for example «I can change my skills and knowledge through practice», «Effort makes me stronger» and «I can influence and change my general development». In this study Cronbach's alpha showed good internal consistency at $\alpha = .81$.

General flow scale

Flow was measured through the General Flow Proneness Scale (Elnes & Sigmundsson, 2023). This is a new scale tested to be context independent. The General Flow Proneness Scale consists of a 13-item scale assessing flow. Participants responded to 13 statements. Statements regarding flow proneness were for example: «I have many different fields of interest», «I find it hard to leave or end a project I am working on», or «I enjoy challenging activities/tasks that demand a lot of focus».

The answer alternatives followed a 5-point Likert-scale. 1 = *strongly disagree* to 5 = *strongly agree*. Respondents with an average flow score of 5 are considered to have a high flow proneness, and an average score of 1 is a low flow proneness score. The Flow score mean is calculated through the 13 items. In Elnes and Sigmundsson (2023), the General Flow Proneness Scale showed good internal consistency with a Cronbach's alpha value of .78. In this study the Cronbach's alpha was similar, with an acceptable value of .76.

Statistical analyses

Data was analyzed in IBM SPSS Statistics version 27. The downloaded data set was preprocessed and ready for use. The data analysis was conducted using Pearson's correlation. Assumptions for normality and homoskedasticity were visually inspected and met. A few outliers were detected by inspecting boxplots for each variable, but these were not removed due to being deemed not influential to the overall outcome. For the descriptive statistics, an independent samples t-test was used as a descriptive measure to investigate any significant differences in gender in the variables. A bivariate Pearson correlation was used to explore the relationships between mindset, growth mindset, and flow. By conducting a split-file analysis by gender, two separate male and female bivariate Pearson correlation analyses were completed to

explore potential significant correlations for growth mindset and Flow. Findings were deemed significant at the $p < .05$ level.

Results

Descriptive Statistics

Descriptive statistics for the entire sample, as well as the additional hypothesis, are reported in table 1. The mean scores indicate that participants generally scored highly on the growth mindset scale. The average score for flow was lower than for each mindset variable. Specifically, for mindset, females had a statistically significant higher score ($M = 4.18$, $SD = 0.85$) than males ($M = 4.12$, $SD = 1.04$). There were no statistically significant gender differences found in growth mindset or flow.

Table 1

Mean and Standard Deviation on Each Variable for Whole Sample, Males, and Females

Variables	Whole ($N = 671$) $M (SD)$	Males ($n = 275$) $M (SD)$	Females ($n = 395$) $M (SD)$	P^*
Mindset	4.15 (0.93)	4.12 (1.04)	4.18 (0.85)	<.001
GM	4.31 (0.44)	4.36 (0.46)	4.27 (0.43)	.386
Flow	3.48 (0.53)	3.60 (0.52)	3.39 (0.52)	.928

Note. GM = Growth Mindset

P-values (two-tailed) derived from an independent samples t-test.

Correlational Analysis

Pearson's bivariate correlation was used to investigate the relationships between the constructs growth mindset and flow. Table 2 shows the result of the correlation between the variables for the whole sample ($N = 671$). Tables 3 and 4 show the results of correlation between the variables for male ($n = 275$) and female ($n = 395$) respectively.

Table 2

Pearson Bivariate Correlational Analysis Between Growth Mindset, Mindset, and Flow (N = 671)

Variable	GM	Mindset	Flow
GM	1.00		
Mindset	.19**	1.00	
Flow	.41**	.14**	1.00

Note. $p < .001^{**}$ (two-tailed)

GM = Growth mindset

For the Sigmundsson and Dybendal's growth mindset scale results show a significant positive moderate correlation between growth mindset and flow, $r = .41$, $p < .001$. Dweck's mindset scale is also positively correlated with flow at $r = .14$, $p < .001$, but the result is weak.

Table 3

Male Pearson bivariate correlational analysis on growth mindset, mindset, and flow

Variable (n)	GM	Mindset	Flow
GM (275)	1.00		
Mindset (275)	.16**	1.00	
Flow (275)	.43**	.10	1.00

Note. $P < .001^{**}$ (two-tailed)

GM = Growth mindset

To investigate the relationships between growth mindset and flow in relation to males, a Pearson's correlational analysis was utilized. Results show growth mindset to have a moderate positive significant correlation with flow, $r = .43, p < .001$. And a non-significant correlation is shown between mindset and flow, $r = .10, p > .001$.

Table 4

Female Pearson bivariate correlation analysis on growth mindset, mindset, and flow (395)

Variable (n)	GM	Mindset	Flow
GM (394)	1.00		
Mindset (395)	.24**	1.00	
Flow (395)	.38**	.20**	1.00

Note. $P < .001^{**}$ (two-tailed)

GM = Growth mindset

To investigate the relationships between growth mindset and flow in relation to females, a Pearson's correlational analysis was utilized. Results show growth mindset to have a weak positive significant correlation with flow, $r = .38, p < .001$. a weak positive significant correlation is found between mindset and flow, $r = .20, p < .001$.

Discussion

The aim of this study was to gain insights about the hypothesized connection between having a growth mindset and experiencing flow, and to investigate gender's possible role. The idea of mindset facilitating flow and consequently resulting in positive feelings of mastery, well-being, and motivation builds on the work of Dweck and Csikszentmihalyi. In the main hypothesis, it was predicted that a growth mindset would show a statistically significant correlation with flow. In the additional hypothesis, it was predicted that a statistically significant positive correlation would be observed for both males and females. In general, the results supported both hypotheses.

Regarding the main hypothesis, for Sigmundsson and Dybendal's growth mindset scale, the results show a positive and statistically significant correlation between growth mindset and flow, indicating a possible relationship between the two variables. For Dweck's mindset scale, results also show a positive and statistically significant correlation between mindset and flow, though weaker. Regarding the additional hypothesis, results show males to have a stronger correlation between growth mindset in flow for Sigmundsson and Dybendal's scale compared to females. But for Dweck's mindset scale results for males were non-significant, whilst for females it shows a significant weak positive correlation. In what remains of this Discussion, the principal findings will be discussed and reflected on in regard to growth mindset and flow, followed by an account on the discovered correlational differences between the genders, before linking growth mindset and flow in the final subchapter.

Growth mindset and flow

The aim for the main hypothesis was to explore the relationship between growth mindset and flow in a sample of 671 participants. The current study's findings concur with Caniëls et al. (2021) who found a significant positive correlation between growth mindset and flow $r = .33, p < .01$. Depending on the scale we compare with, our results are slightly bigger for Sigmundsson and Dybendal's scale ($r = .41, p < .001$), and smaller for Dweck's mindset scale ($r = .14, p < .001$). This could be related to the present sample being larger and consisting of people of different ages and in different situations with different educations, compared to Caniëls and colleagues' study consisting of participants from mid- and back-office employees of a Dutch financial service organization. Or it could be related to Caniëls et al. (2021) limiting Dweck's mindset scale to solely measure growth and not fixed mindset by using only the positively worded items, in addition to adapting the items to reflect the work-context. By doing this, they created a scale more similar to Sigmundsson and Dybendal's scale - which is reflected in the similarity of the correlational results. To clarify, the growth mindset scale's implemented are different from the one's used utilized in the present study.

Moreover, different flow scales were utilized. In the current study, Elnes and Sigmundsson's (2023) general flow proneness scale was implemented, whilst Caniëls et al. (2021) opted for the work-related flow inventory (WOLF), developed and validated by Bakker (2008). The WOLF scale utilized the same number of items (13) but differs in that it is worded to relate to the workplace, in addition to set forth work-related flow as a construct with three dimensions containing absorption, enjoyment, and intrinsic motivation (Caniëls et al., 2021). In contrast, the general flow proneness scale tries to capture flow proneness across situations, focusing on preference for challenge, ability of balancing skills and challenges, frequent flow

experiences, and development of interest (Elnes & Sigmundsson, 2023). The differences in context and scales may be factors influencing the results, even though the results indicated relatively similar correlational values.

However, research has also shown the relationship between growth mindset and flow to be statistically non-significant. Tan and colleague's (2021) study on what facilitates flow in musicians did not find a significant correlation between the two variables. In fact, growth mindset did not significantly correlate with any variables in their study. According to the authors, this was assumed to be due to the participants' Asiatic origin where natural talent is perceived as more important than hard work (Mercer & Ryan, 2009). As Tang et al. (2016) concludes, growth mindset is culture-dependent in that certain cultures consider creativity as undevelopable and fixed. The statistically significant results from the current study are a further indication of the concept being culturally dependent.

In summation, this section summarized and compared this study's findings to previous research on the relationship between growth mindset and flow. Results show a significant positive correlation between growth mindset and flow, with slightly stronger correlations observed using Sigmundsson and Dybendal's growth mindset scale compared to Dweck's mindset scale. Overall, the results confirmed the main hypothesis.

Gender's potential role

The aim of the additional hypothesis was to explore the relationship between growth mindset and flow in relation to gender. In this study, the scales were applied to 275 males and 395 females. The descriptive statistics revealed that females had a statistically higher mindset score compared to males. However, no significant differences were shown for growth mindset or

flow. The study predicted a significant positive correlation between growth mindset and flow for both males and females.

The correlational analysis supported this prediction, showing a moderate positive significant correlation between growth mindset and flow for males when using Sigmundsson and Dybendal's growth mindset scale, $r = .43, p < .001$. However, when using Dweck's mindset scale, the correlation was non-significant. For females, the correlational analysis supported the prediction, indicating a weak positive significant correlation between growth mindset and flow when using Sigmundsson and Dybendal's growth mindset scale, $r = .38, p < .001$, and Dweck's mindset scale, $r = .20, p < .001$.

The correlational results for both males and females confirm that the relationship between growth mindset and flow varies between the genders. A stronger correlation was demonstrated for male's growth mindset in relation to flow using Sigmundsson and Dybendal's scale. Females also showed a positive correlation, though weaker. Nevertheless, it is important to note that a non-significant result does not necessarily mean that there is no relationship between the variables in the population. It may simply indicate that the gathered data in this study, did not hold a significant correlation for males between Dweck's mindset scale and flow. When following Sigmundsson and Dybendal's growth mindset scale, results indicate that growth mindset males have a higher flow proneness and vice versa.

Overall, the results from the current study do support the hypothesis for females in both scales, but for males the hypothesis is only supported with Sigmundsson and Dybendal's growth mindset scale, and not Dweck's mindset scale.

Linking growth mindset and flow

In *Flow – The Psychology of optimal experience* (1990), Csikszentmihalyi writes about the importance of finding enjoyment in the task, building inner harmony, controlling the conscious, and the different ways to achieve flow. By relating a growth mindset to different constructs believed to facilitate enjoyment, harmony, and control of the conscious, it is possible to extrapolate meaning from the positive correlation between flow and growth mindset in the present study.

Enjoyment and pleasure

Pleasure is essentially a feeling of contentment achieved when expectations set have been met. Pleasure also improves quality of life, according to (Csikszentmihalyi, 1990). Enjoyment results when one goes beyond expectations. In the literature this is characterized by well-being, achievement, engagement, and motivation. All of which have been found to significantly correlate positively with endorsing a growth mindset.

In Nalipay et al. (2022), growth mindset is measured against different facets of well-being including, achievement, positive relationships, engagement, positive emotions, and meaning, positively correlating with all of them. And in Zeng et al. (2016), growth mindset predicted higher psychological well-being and engagement for students. Having positive sensations, engaging with one's surroundings, achieving personal goals, and going beyond expectations are, undeniably, factors by which one encounters enjoyment. If endorsing a growth mindset is pertinent to these outcomes, then it must be a factor from which one can expect facilitation of flow.

Pursuing work, through work engagement, could cause employees to have more frequent flow experiences. Since growth mindset individuals tend to treat failures as challenging and energizing, this would promote energy and enthusiasm at work, according to Heslin (2010). This trait can, similarly, help them persevere through difficult tasks and eventually lead one to more mastery and enjoyment in their accomplishments. Furthermore, growth mindset individuals may be more likely to seek out feedback or learning opportunities, which can enhance their chances of obtaining the necessary skills to tackle a challenging task - establishing balance - resulting in more situations where flow is achievable.

Intriguingly, in today's business environment, productivity and compensation tend to take precedence over creating an enjoyable work environment. However, if jobs were designed to resemble games with variety, challenges, clear goals and immediate feedback, they could become more enjoyable, thus paving the way for flow (Csikszentmihalyi, 1990). Combined with a growth mindset, this could significantly enhance the likelihood of experiencing flow.

Building inner Harmony

How our mind interprets, and filters everyday experiences plays a key role in our level of happiness. One must strive to become less sensitive to set-backs, stress, and negativity (Csikszentmihalyi, 1990).

As was presented in the theoretical framework, studies have shown growth mindset to correlate with, or predict outcomes, such as resilience (Tao et al., 2022; Yeager & Dweck, 2012), coping with stress (Burnette et al., 2020; Xu et al., 2021), and less reported levels of negative affect (King, 2017). Building a strong foundation for oneself, being sturdy, not letting failure get

in the way of the goal, and keeping a more positive outlook on situations seems core to growth mindset endorsers. Fostering this way of thinking may subsequently influence our thoughts and behaviors, affecting the aforementioned attributes. As priorly mentioned, an individual facing negative feedback could see to augment effort next time around due to their core belief that they can learn and grow - without being discouraged from set-backs (Dweck, 2007b). In this process of bouncing back, the individual is highly likely to develop their skills or knowledge in tackling the challenge anew, balancing out what was earlier a steeper uphill battle.

Balance of skill and challenge, induces flow, and leads to a sense of enjoyment following its completion (Csikszentmihalyi, 1990), and a more long-term happiness will follow as a result of the effort put into the specific goal pursued (Csikszentmihalyi et al., 2005). This could then lead to greater engagement and enjoyment in tasks, ultimately contributing to flow experiences.

Control of the conscious

Learning to take control over the conscious requires commitment, will, and belief (Csikszentmihalyi, 1990). Forming a consciousness that views challenges, internal and external, as manageable, might facilitate this.

Nallapothula et al. (2020) found that growth mindset individuals tend to possess an internal locus of control, which enables them to believe that they have control over their actions and outcomes by interacting with the environment, for example by increasing effort (Blackwell et al., 2007). Keller and Blomann (2008) argue that people with strong internal locus of control are predisposed to perceive control in activities where the task demands and skills are in compatibility. In turn, this is assumed to lead an individual to enjoy the task more than

individuals who do not believe in personal control (i.e., external locus of control). Taylor et al. (2006) found that more frequent experience of flow is positively correlated with internal locus of control, thus strengthening the notion of growth mindsets involvement. In contrast, fixed mindset individuals may have a lower sense of control, as found in a study by Ommundsen et al. (2005). Perceiving low control was associated with negative affect in Pekrun (2006), while fixed mindset students reported more negative affect (King, 2017), compared to growth mindset individuals. Such negative emotions are thought to suppress one's ability to achieve flow as frequently (Caniëls et al., 2021).

Having a growth mindset and sensing greater control over personal influence on outcomes (i.e., internal locus over control) seems intertwined. This combination results in less reported negative affect, which is thought to enhance the ability to achieve flow. In addition, sustaining their level of enjoyment and staying absorbed in the task is a necessary requirement to experience flow.

Limitations

This study is subject to several limitations. Firstly, a survey-method with self-reported measures was used to gather information on constructs which are socially desirable. Respondents might want to enhance their scores to present themselves in a more positive way (Schwarz et al., 2008). In a similar manner, a lack of understanding of the presented constructs in the survey, the participants may have overestimated their own mindset beliefs, or understanding of flow and its frequency - potentially impacting their answers.

Secondly, the response rate for this study was not possible to determine as no record of the number of people asked to participate was made. If the individuals who did not choose to participate in this study deviated from those who did participate, this could have affected the results, biasing one way or another.

Thirdly, this study is of correlational nature. Meaning that the results should be interpreted accordingly. The findings do not stipulate a causal relationship, only associations were reflected. To clarify, growth mindset is indicated to be associated with flow, but a causal relationship cannot be concluded from these results. Further, this implies that the study is not able to determine in what direction the relationship between growth mindset and flow goes.

Lastly, differences in the utilized scales begs the question for whether Dweck's mindset scale should continue to be the leading mindset scale. Midkiff et al. (2018) suggest the 8-item growth mindset scale may not be the most efficient way to measure growth mindset. Due to the scale measuring two constructs with both negative statements (fixed mindset) and positive statements (growth mindset), it is deemed less precise. The mixed format may introduce some response bias or confusion for the respondents. Instead, it is suggested that a scale should have only positive statements and consequently only measure growth mindset.

In Sigmundsson and Dybendal's newly developed scale, only positively worded statements are included, solely measuring growth mindset. Which might be a factor reflected in the results, by a stronger positive correlation compared to Dweck's mindset scale. However, Dweck's scale has a solid theoretical foundation, and its use in various contexts has provided valuable insights into the impact of mindset on various outcomes (Dweck, 2000; King, 2017; Kondratowicz & Godlewska-Werner, 2022). Being a new scale, Sigmundsson and Dybendal's

growth mindset scale needs to be applied in further studies to establish itself across different populations and situations.

To summarize, the limitations of this study include the use of self-reported measures, which can be subject to social desirability and potential overestimation of mindset beliefs and understanding of flow. The lack of a recorded response rate introduces the possibility of response bias and limits generalizability. As a correlational study, no causality can be established, and no direction of the relationship between growth mindset and flow can be determined. Moreover, while Dweck's mindset scale has a solid theoretical foundation, Sigmundsson and Dybendal's growth mindset scale showed a stronger positive correlation with flow in this study. However, further research is needed to validate and apply the new scale across diverse populations and contexts.

Implications and future studies

The many correlations between growth mindset and outcomes which are also related to flow proneness postulate a complex relationship. As this relationship may be conditional, the underlying processes through which the positive effects occur need further clarification. In this regard, future studies on this matter should investigate how and when a growth mindset relates to flow and other positive outcomes. To fully understand the nature of this relationship it would be valuable to investigate potential moderating and mediating factors, alongside how the relationship might vary across different types of tasks, domains, and settings. To exemplify, as elaborated on previously, locus of control is indicated to share similarities with growth mindset, and in that regard could be investigated alongside growth mindset in relation to flow.

Gender's role in mindset and flow's relationship might influence the strength of the correlation, as indicated in this study. For Sigmundsson and Dybendal's growth mindset scale, both genders had positive statistically significant results. However, Dweck's the mindset scale produced a statistically significant result solely for females. The data did, in other words, not provide sufficient evidence for Dweck's scale to conclude that there is a significant association between mindset and flow for males in this population. Which could be explained by specific characteristics in the sample, or limitations in the measurement used. This inconsistency begs the need for further research into the matter to provide a more comprehensive understanding in regard to the significance of gender.

As mentioned in Limitations, a self-report measurement should be avoided when dealing with complex constructs which may be difficult to grasp with little prior knowledge. When investigating, to increase external validity, it should be considered to use a different method than surveys to gather information on growth mindset and flow, due to social desirability. I suggest introducing observational tasks such as has been produced in Blackwell et al. (2007). For example, in a school or work setting, to perform an intervention to teach about growth mindset and flow, and then assess the effects on motivation and performance, in comparison to a control group.

To add, two different scales were utilized in this study to measure growth mindset. As Dweck's mindset scale has been used in a multitude of prior studies, it would be interesting to see Sigmundsson and Dybendal's newly developed scale in different contexts compared to Dweck's. Similarly, Elnes and Sigmundsson's general flow proneness scale should be tested in different context, for example such as the work context to see how it does compared to the work-

related flow inventory scale (WOLF). New scale's measuring complex constructs such as these could prove to be beneficial for future research in that it provides comparable means to a range of contexts.

Conclusion

This study investigated the link between mindset, flow, and gender. The findings for the main hypothesis were positive correlations between the two variables with respect to the two mindset scales implemented. The findings regarding the additional hypothesis were significant positive correlations between growth mindset and flow for females in both scales, and a significant positive correlation for males in Sigmundsson and Dybendal's scale, with a non-significant result for Dweck's scale's relation to flow.

Further, by demonstration of the possible paths between growth mindset and flow, the complexity of their relation was illuminated. With a growth mindset is a desire to grow, stemming from individuals wanting to replicate flow experiences which can be achieved by continuously learning new skills and actively seeking additional and increasingly more complex challenges. By applying the findings of this study, individuals can recognize the importance of a growth mindset and further create conditions from which they will continue to experience flow through their lives (Krskova & Breyer, 2023). Further understanding on this relationship might benefit individuals, educational institutions, or organizations if taught and facilitated. Additionally, by following Csikszentmihalyi's notions on enjoyment, harmony, and control of the conscious a more fulfilling life may present itself.

In sum, a growth mindset was shown to correlate positively with flow. The explanation for which could be multifaceted and might be related to mindsets' influence on the types of emotions and individual experiences – and perception of control - when faced with a challenge. When it comes to gender, results on growth mindset and flow showed males having a higher correlation between the variables, compared to females. Though this was not the case for both scales, as Dweck's mindset scale showed a non-significant result for males but a positive significant correlation for females. Future research should strive to gain a more nuanced and comprehensive understanding of the conditions under which the variables cooperate, in addition to exploring the potential accentuation of gender in the process of “growing with the flow”.

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