



Master's Thesis

Master in Behavioral Science

June, 2021

Growth mindset theory and Culture;

an Additional Perspective on Future Development of

Measurement Tools and Interventions

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Course code: MALK5000

Credits: 30 points

Faculty of Health Sciences

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**Growth mindset theory and Culture;
an Additional Perspective on Future Development of Measurement Tools and
Interventions**

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June 15, 2021

PREFACE

The subjects provided in the master's program, including the labs; Experimental Studies of Complex Human Behavior, led by Dr. Erik Arnzen and Cultural Selection, and Behavioral Economics Lab, led by Dr. Ingunn Sandaker, have provided me with another layer of knowledge about human complexity.

First and foremost, I want to thank my supervisor, Gunnar Ree. For your critical evaluation of content and support throughout the writing process. And to Hugo Pripp, for sharing his statistical knowledge.

I would like to thank the consulting firm and the consultant for his time and for providing the data from the growth mindset survey.

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I would also like to thank my study group, and especially Ina Berby and Esnath Julius Mwaiselage for everlasting discussions and new perspectives.

Finally, I need to thank my partner and family. My family for providing me with a learning history that in turn made it possible to complete a master's degree and to my partner for his support and understanding.

Abstract

The growth mindset framework has attained the status of a prominent motivational theory, assuming a causal relationship between mindsets and performance levels. The level and type of mindset are established using questionnaires. The present thesis analyzes early studies of growth mindset with the systematic use of variables that are manipulable - if only in principle. The observational basis of questionnaires is interpreted to be the participants' verbal descriptions of current contingencies and individual learning history. Then, growth mindset culture is analyzed in terms of behavioral contingencies and cultural selection. Using data collected by a consulting firm, a relationship between growth mindset culture and a target Key Performance Indicator (KPI) is examined. The respondents to the Growth Mindset Index (GMI) were employees (N= 162) in thirteen stores under the same chain. A Pearson's correlation coefficient was computed to assess a relationship between growth mindset culture and KPI. To assess the statistical connection between factors in the GMI and KPI, five additional linear regression analysis was computed. The results indicate non-significant correlations between GMI and KPI and singular factors and KPI. The validity and reliability of the GMI and Growth mindset theory are discussed. Verbal descriptions can provide insight into current contingencies in an organization. The suggestion is that measurement tools should include factors able to evoke rule-governed behavior in organizational contingencies that is consistent with specific goals. The use of functional analysis before the implementation of interventions may enable later demonstration of control.

Keywords: Growth mindset theory, Rule-governance, Behavioral contingencies, Measurement tools, Interventions

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**Growth mindset theory and Culture;
an Additional Perspective for Future Development of Measurement Tools and
Interventions**

The growth mindset framework developed by Carol Dweck (Dweck, & Leggett, 1988) has attained the status of a prominent cognitive motivational theory. The growth mindset theory suggests that individuals with a growth mindset believe that intelligence is malleable, while individuals with a fixed mindset believe that intelligence is a static and non-controllable trait (Dweck, & Leggett, 1988). The type of mindset one has is said to significantly effect performance-related outcomes (Costa, & Faria, 2018; Dweck, 2006; Yeager, Johnson et al., 2014). The common denominator for the application of the framework, is that having or inducing a growth mindset, or a growth mindset culture can enhance performance in different domains (Derler, 2020; Diener, & Dweck, 1978; Dweck, 2006; Elliott, & Dweck, 1988; Hong, Chiu et al., 1999). The correlations between mindsets and other behaviors (e.g., performance level) are described as a causal relationship, where the type of mindset sets up different behavioral responses (Dweck, & Leggett, 1988). To assume a causal relationship between non-manipulated variables are in accordance with the scientific goal in cognitive science (Hayes, & Brownstein, 1986). The scientific goal is met with precise descriptions and correct prediction of co-variation between behavioral and environmental events (Hayes, & Brownstein, 1986, p. 180). The ontological assumptions in cognitive science can be understood as mechanistic, where each part of a given system can be described as separate, independent, and orderly (analogous to a machine). The truth criterion following the mechanistic world view is one of correspondence, meaning that in cognitive science, explanations of behavioral events are true as far as we agree on their description (Hayes, & Brownstein, 1986). When investigating each part of a system and interactions between parts, external causes that might lead up to the observations described are not

relevant (Hayes, & Brownstein, 1986). The scientific goal of precise description and correct prediction is met without concern for demonstration of control (Hayes, & Brownstein, 1986).

The ontological and epistemological assumptions in behavioral analysis are different. The scientific goal of behavioral analysis includes precise description and correct prediction and adds demonstration of control – establishing functional relations (Hayes, & Brownstein, 1986; Skinner, 1953). When investigating causes for behavioral phenomena in behavioral analysis, the scientist starts outside the behavior itself, with the external conditions that the behavior is a function of (Skinner, 1953). Behaviors are to be described in relation to their controlling functions in contingencies, where a contingency is a unit containing the relationship between antecedents, behavior, and consequences (Catania, 1979/2013). Pragmatic concepts like contingencies allow for the demonstration of control between environmental variables and behavior at the same time, giving an analysis of behavioral events an endpoint, namely when a successful demonstration of control between variables has been shown (Hayes, & Brownstein, 1986). Demonstration of control between variables separates verbal descriptions of behavioral events and the cause for the events, which is contingencies of reinforcement (Skinner, 1953). The world view of radical behaviorism as contrasted to cognitive science can be understood as a type of contextualism, with a pragmatist epistemology. The corresponding truth criterion is that concepts are true so far as they enable the scientist to deal effectively with the phenomena under investigation (Hayes, & Brownstein, 1986, p. 177). The truth criteria can only be tested through demonstration of experimental control of co-variation between environmental and behavioral events that are manipulable, if only in principle (Hayes, & Brownstein, 1986).

The growth mindset theory suggests a causal relationship between what one believes (i. e. thinking) and its effect on overt behaviors without any historical prerequisites needed. According to the tenets of behavioral analysis, this is a description of a behavior-behavior

relationship (Hayes, & Brownstein, 1986; Zettle, 1990). Verbal behavior, being vocal, textual, expressed in sign language, or as thinking, is by definition to be explained with reference to behavioral contingencies and learning history, in the same way as non-verbal operant behavior (Skinner, 1957a, 1957b; Zettle, 1990). Verbal behavior can therefore be studied with the same scientific premises as non-verbal behavior, where one difference between verbal and non-verbal behavior is that the latter is reinforced by direct contingencies and verbal behavior is reinforced through the mediation of members in a verbal community (Skinner, 1957a). Covert verbal behavior such as thinking (and stating self-rules) and rule-governed behavior (overt behavior) are treated as behavior on a continuum, from covert behavioral responses evoked by external and internal events to overt actions. Covert rules, like other behaviors, are assumed to be evoked by current contingencies (Moore, 2003; Palmer, 2009; Skinner, 1969; Zettle, 1990), meaning that evocation of covert rules is still a function of events outside the covert behavior itself (Hayes, & Brownstein, 1986). The different ontological assumptions with their corresponding epistemology lead to separate and distinct units of analysis, and differences in data interpretation (Hayes, & Brownstein, 1986).

In the introduction section of the thesis, a behavioral analytic interpretation of the motivational theory growth mindset and the concept of growth mindset culture are presented. In the method section, the study investigates correlations between growth mindset culture - a concept derived from studies on growth mindset and performance. The behavioral interpretations of the concept later investigated in the thesis' method section should provide the reader with an additional perspective on the concept mindset and the added goal of demonstration of control. Both perspectives can be of value when developing measurement tools and interventions. The next sections will describe the development of the growth mindset theory and provide a description of rule-governance.

Development of the growth mindset theory

The cognitive-affective-behavioral framework presented in a 1988 article by Carol Dweck provides the theoretical foundation for today's growth mindset theory (Dweck, & Leggett, 1988). The article is a systematized selection of Dweck's and colleagues' research and results under three subject matters: 1) attribution type, behavioral patterns, and performance, 2) behavioral responses and goals, 3) implicit theories, goals, and behavioral responses. Dweck and colleagues (1988) suggest that the underlying psychological processes that set up different behavioral responses are the individual's implicit theory of intelligence (ITI). The two different implicit theories; entity and incremental theory are analog to today's growth and fixed mindsets (Dweck, 2006). For an entity theorist (fixed mindset), intelligence is assumed to be a static-like trait and for the incremental theorist (growth mindset), intelligence is assumed to be malleable (Dweck, & Leggett, 1988). At the beginning of the theory development, and also in later studies, participants were categorized as either an entity or incremental theorist based on verbal responses to the level of agreement with items related to entity or incremental tendencies (e. g., "your intelligence is something that you can change") (Dweck & Leggett, 1988). The procedures and measurement tools, designed by Dweck and colleagues to investigate correlations between ITI, behavioral patterns, and academic achievements were inspired by the growing research on attribution theory and learned helplessness from a period when the cognitive revolution started to impact the field of psychology (Dweck, & Yeager, 2019).

The interest in the phenomenon of ITI/growth mindset and performance in different context has produced several studies investigating correlations between the self-theories and behavioral responses (McConnell, 2001; Robins, & Pals, 2002; Spinath, Spinath et al., 2003; Stipek, & Gralinski, 1996). From the turn of the millennium, an interest in growth mindset interventions across domains emerged (Dweck, & Yeager, 2019). Most of the interventions were applied in academic settings, where the goal was to teach students about the concept of

growth mindset, assuming this would induce this type of mindset. The general hypothesis was that inducing a growth mindset could alter motivation and behavior (Blackwell, Trzesniewski et al., 2007; Burnette, Russell et al., 2017; Yeager, Johnson et al., 2014; Yeager, Lee et al., 2016; Zeng, Hou et al., 2016). Various procedures for teaching participants about growth mindset have been tested. For example, online interventions to teach students that the brain is malleable, workshops where students write about how they overcame obstacles in the past, to passive sessions where an instructor talks about growth mindset and its implications (Sisk, Burgoyne et al., 2018). In addition, it was proposed that whole cultures or contexts could possess a growth or fixed mindset (Dweck, 2006; Murphy, & Dweck, 2009). The concept of growth mindset culture will be introduced, after a description of rules and the behavioral interpretations of two growth mindset studies.

Rules

Verbal behavior is a special case of ontogenic selection and is shaped, extinguished, and maintained by its production of consequences in contact with a verbal community; where a verbal community consists of sets of contingencies evolving in groups when interacting with their environment (Skinner, 1957a). These contingencies, including the listeners' response, regulate the members' verbal behavior by producing reinforcing or punishing consequences (Skinner, 1957a). Covert verbal behavior – thinking – is, by definition, stimuli experienced by the individual herself, where the person talking is also the listener (Skinner, 1957b). Covert verbal behavior is verbal behavior produced and experienced by the individual herself, and as other verbal and non-verbal behaviors explained with reference to past and current behavioral contingencies (Skinner, 1957b; Zettle, 1990).

Rules, defined as contingency specifying stimuli, and rule-governed behavior (i.e. behavior under the control of rules) were first described by Skinner (1969) in relation to problem-solving. There are observed differences in response patterns between humans and

non-human animals when performing on schedules of reinforcement (Harte, Barnes-Holmes et al., 2020). For human participants, verbal instructions, telling the participants how to respond tended to evoke rule-governed behaviors (i.e., complying with the rule), even when the instruction provided inaccurately described the direct-acting contingency in the schedule (Leander, Lippman et al., 1968). In addition, when minimal instructions were provided, participants would show different response patterns when performing on the same schedule. The different response patterns can suggest that participants formulate different covert rules as a result of different experiences with previous schedules (Weiner, 1964). Covert rules can be understood as contingency-specifying stimuli produced by a person's verbal behavior and are shaped in past and current contingencies in an environment (Skinner, 1969; Zettle, 1990). One advantage of rule-governed behavior is that it allows for the production of reinforcing consequences and avoidance of aversive stimuli without emitting behavior under direct-acting contingencies (Malott, 1989). When learning how to operate a sailboat, learning math, writing a thesis, or solve some other problem one has never been in contact with before, humans have the advantage that descriptions of contingencies can exert control over their behavior (Malott, 1989).

Rules evocative function on overt behaviors are dependent on a special history of differential reinforcement (Malott, 1989; Skinner, 1969). For rules to evoke other behaviors, requisite behavioral repertoires need to exist, and the verbal community and environment must have delivered consequences for compliance and non-compliance with rules in the past (Malott, 1989; Skinner, 1969). Rules' evocative function on overt behavior is a result of a learning history where following specific rules has led to 1) the reinforcer specified in contingencies, 2) socially mediated reinforcement for compliance, 3) aversive stimuli specified for rule-breaking, and 4) socially delivered punishers for non-compliance (Malott, 1989). Under such contingencies, over time, rules become a generalized stimulus class

(Malott, 1989; Schlinger, & Blakely, 1987). Complete rules, stated by others or oneself, specify antecedents, behavior, and consequences, where the event described in the rule or stating the rule 1) can function as a discriminative stimulus, 2) can function as a motivating operation, and 3) have a function altering effect on other stimuli (Malott, 1989; Schlinger, & Blakely, 1987; Skinner, 1969).

Frequently, rules specify some but not all elements of a contingency, by just including a consequence, a behavior, or an antecedent (Poppen, 1989). When a supervisor states a rule to her employees demanding to see on-task behaviors when she is in the office, this rule does not necessarily function as an S^D for the on-task behaviors but stating the rule can alter the function of the supervisor's presence in the office and can bring rule-governed behavior under the control of this stimulus (Schlinger, 1993). For a rule to function as a discriminative stimulus, the consequence described in the rule must have been produced when emitting the behavior in the past and has not been produced when this behavior has not been emitted (Malott, 1989). In addition, current social contingencies for compliance can evoke rule-governed behavior, and not necessarily the event described in the rule (Malott, 1989).

An example of how covert rules describing contingencies in the future control present behavior is when one sets out to write a thesis. A covert rule that specifies some reinforcing outcome in one year, demanding the continuous emission of specified behaviors, can control present overt behavior. This comes from a differential learning history with reinforcing and punishing events for compliance and non-compliance with the rule; a behavioral repertoire that allows for rule-governance. Peoples' s covert rules can be important factors in understanding causes for differences in performance between people in the context of achievement of goals, self-control, and motivation (Hayes, 1989; Malott, 1989; Skinner, 1969). The next section is a description of a repertoire that is assumed to enable covert rules to influence other behaviors.

Prerequisites for rule-governance

A repertoire that allows for covert rules to influence overt behavior is developed stepwise when people interact with their verbal community (Malott, 1989). Prerequisites for covert rules to influence control over overt behaviors are that 1) past compliance with specific rules has led to reinforcement and non-compliance has led to aversive stimuli, 2) the individual's reinforcement history with specific rules enables new arrangement of verbal stimuli (i.e. novel rules) to effectively control behaviors in new settings, and 3) there is self-evaluation, and effective behavioral consequences for following rules (Malott, 1989).

Concerning self-evaluation, which contributes to shaping and formulation of covert rules, this is assumed to be induced by interacting with one's verbal community and environment.

Where interacting with other members of a verbal community produces consequences for correspondence between what one is saying and how one is behaving (Zettle, 1990). When a person is engaging in a task or activity, such as writing a thesis, other members of a verbal community will question different aspects of the performance. The person writing the thesis will in return provide descriptions of sets of contingencies related to the activity to the listeners, and this may contribute to control the speaker's overt behavior (Zettle, 1990, p. 45).

Rule-governed behaviors may be reinforced when complying with self-rules produces the desired consequence described in a contingency, and through socially mediated reinforcement for correspondence between following one's own rule (e.g., strategy, plan, idea) and some desired outcome (Zettle, 1990, p. 45).

Psychological constructs such as mindset or covert rules are unavailable for direct observation by others (Hayes, & Brownstein, 1986). Using covert rules in a causal chain to explain overt behavior is therefore an interpretation rather than an experimentally demonstrated relationship (Palmer, 2009). Stating covert rules is defined as behavior, and in contrast to psychological constructs, this can be explained through the concept of

contingencies (Hayes, & Brownstein, 1986). The present account of covert rules and their controlling function on overt behaviors are now used to interpret studies of growth mindset.

Study 1 – Attribution type and performance during failure feedback

Diener and Dweck (1978) conducted two experiments to investigate differences in spontaneous verbalization and strategies during failure feedback. This was one of several studies of attribution that form the foundation for what is today's growth mindset theory. The assumption was that attributing failure to effort rather than ability correlates with improvement of performance on challenging tasks (Dweck, & Leggett, 1988).

The first dependent variable was children's "hypothesis-testing strategy". The second dependent variable was "spontaneous verbalizations" during the failure-feedback condition. Both experiments first introduced eight solvable tasks, and four additional "problem-tasks", on which the feedback was always "wrong". First Children in 5th grade (N=70) responded to the Intellectual Achievement Responsibility Scale (IAR), a 34-item questionnaire to measure the degree of attribution to external or internal factors in addition to questions related to attribution of failure to lack of effort. The participants were then categorized as helpless when scores on attributing to effort were lower than 7 points and categorized as mastery-oriented for scores over 8 points. The participants were introduced to eight discrimination tasks where the feedback for the first tasks consisted of "right" or "wrong" depending on their answer. After the eight solvable tasks, the four problem-tasks were introduced. The scoring procedure for the variable "hypothesis-testing strategy" was children's "useful strategies", where being able to utilize feedback efficiently could at some point lead to a solution to a problem, or "ineffectual strategies" which could not lead to a solution and occurred when choices were made independently of feedback. To establish verbalization categories, at least ten children needed to verbalize content related to the category. Some of the categories scored were: 1) statements of useful-task strategy, 2) attribution to lack of ability (e.g., *I'm not smart enough*

to solve this task) 3) self-instructions (e.g., *slow down, focus more*) 4) statements of negative affect (e.g., boredom, anxiety).

In experiment 1, the results indicate that participants from the helpless group to a larger extent attributed failure to own ability (52%). Participants from the mastery-oriented group explained reasons for failure with external causes (e. g.; bad luck, increased difficulty of the task), while no one from this group attributed reasons for failure to their ability. No significant difference was found between the groups for utilizing the feedback they received to continue developing or maintaining their strategies before failure feedback was delivered. Measures of performance during continuous failure feedback showed that participants categorized as helpless showed a deterioration in strategy use in experiment 1, ($n = 21$) compared to the mastery-oriented group ($n = 7$) and in experiment 2, ($n = 24$) versus ($n = 4$). Similar differences were found in improving strategy use between the groups, ($n = 0$) in both experiments for the helpless group versus ($n = 10$) in the mastery-oriented group for experiment 1, and ($n = 11$) for experiment 2. The results from the verbalizations during the problem tasks in procedure 2 showed that participants in the helpless group attributed failure to loss of ability, and in addition verbalized statements of negative affect. More participants in the mastery-oriented group engaged in self-instructions and self-monitoring (e. g.; statements about monitoring one's concentration for the task).

Behavioral interpretation

In a behavioral interpretation, the differences between performance and corresponding verbal behavior (IAR scale responses and verbalizations) can be understood to reflect participants' rules and rule-governed behavior in contact with new contingencies. The factors in the IAR scale can be suggested to function as discriminative stimuli that evoke participants' rule-governed behaviors to the contingencies asked about in the questionnaire (Poppen, 1989). Such rules would be the results of past contingencies in each individual's

learning history and contact with new contingencies (the experimental setting and conditions) (Malott, 1989; Skinner, 1969). An interpretation of the correlation between overt verbal statements relating to lack of own abilities (i.e., rules) and deterioration in performance during the failure feedback condition (i.e., rule-governed behavior) may be that past contingencies have not shaped a behavioral repertoire needed for novel rules to evoke behaviors, and that rule-governed behavior and covert rules regarding lack of own abilities have been reinforced in the past by contingencies in a verbal community. The lack of prerequisite repertoire for rule-governance can be a result of previous deviation from rules where aversive consequences either have not been sufficiently salient or non-existent and that complying with rules in the past has not produced social reinforcement or the reinforcer specified in the rule (Malott, 1989).

The improvement in performance for participants categorized as mastery-oriented can also be accounted for with descriptions of contingencies. Rules relating to attributing failure to situational variables rather than ability, and overt rules about monitoring one's behavior in correlation with improved performance, can be interpreted as the evocation of rule-governed behavior under the control of novel rules to the situational demands. The interpretation is that for these individuals, the rule-governed behaviors are possibly evoked by the failure-feedback functioning as a discriminative stimulus due to contact with previous social contingencies for compliance and punishment in these participants' verbal community (Malott, 1989). The experimental setting could potentially elicit private states like deprivation, sensations of arousal, and stressful stimulation in addition to social contingencies including an audience (Poppen, 1989). This can influence both the descriptions of rules and rule-governed behavior in the situation.

Study 2 – Type of implicit theory predicting attribution of failure to effort or ability

In their 1988 article, Dweck and Leggett refer to studies on correlations between participants' implicit theories and preferred goals that in turn set up different behavioral responses. Regrettably, the studies cited by Dweck and Leggett (1988) (Bandura & Dweck (1981), Leggett (1985) and Dweck, Tenney & Dinces (1982)) are unpublished and unavailable for researchers, which precludes insight into the details in the procedures and results attained.

Hong and colleagues (1999) published three studies on implicit theories. The hypothesis for the first study was that incremental theorists were predicted to attribute failure to effort rather than ability when faced with failure feedback. The dependent variable in the procedure was attribution type after failure feedback was given. The participants ($N = 97$, undergraduate students) were first asked to respond to the Assessment of Implicit Theories scale (AIT) and the Assessment of Self-confidence in Intelligence (ASI). The AIT scale measures the level of agreement or disagreement with the three items on a six-point Likert scale, all depicting entity beliefs: "You have a certain amount of intelligence and you really can't do much to change it"; "Your intelligence is something about you that you can't change very much"; and "You can learn new things, but you can't really change your basic intelligence." (p. 590). The ASI measures confidence in own intelligence; The items are "I usually think I'm intelligent" versus "I wonder if I'm intelligent"; "When I get new material, I'm usually sure I will be able to learn it" versus "When I get new material, I often think I may not be able to learn it"; and "I feel pretty confident about my intellectual ability" versus "I'm not very confident about my intellectual ability." (p. 590). Participants with a score under 3 points were categorized as incremental theorist and participants with scores over 4 points were categorized as entity theorist. $n = 30$ was classified as entity theorist and $n = 50$ as incremental theorist. After responding to the questionnaires, the participants performed an experimental task (a conceptual ability test) that was described to participants as measuring

aspects of their intelligence. When the task was completed, all participants were presented with negative feedback, independently of the factual score of the task.

Neither type of implicit theory nor level of confidence in intelligence had any significant impact on the actual results of the task. Participants' type of implicit theory, on the other hand, predicted attribution to effort. In attribution type, there was more incremental theorist (M= 27,3%) than entity theorist (M= 17,8%) that attributed failure to effort. But there was no significant difference between the type of implicit theory and attribution to ability. There was no significant difference between participant's confidence in intelligence and attribution type.

Behavioral interpretation

The verbal responses to the AIT and ASI may plausibly be interpreted as descriptions of participants rules, but the scales used to measure levels of agreement, restricted to three items about intelligence depicted in one direction (entity statements) may not be able to evoke participants' rules about a broader aspect of intelligence. The forced choice between two mutually exclusive statements about the confidence of own intelligence might also be too narrow when investigating rules. The difference in the attribution of failure to ability is non-significant between the two groups, even if incremental theorists attributed failure to effort more often than entity theorists did. Factors in questionnaires can enable insight into present and past behavioral contingencies (Skinner, 1974), but the factors need to be consistent with the domain under investigation. A measurement tool (e.g., questionnaire) that contains factors that specifies an aspect of participants' past behaviors to a domain can potentially be more efficient when investigating differences between groups.

In an organizational context, correct descriptions of current contingencies are crucial when aiming for behavioral change. When now moving to the generalization of growth

mindset studies and the thesis method part, the suggested benefit of factors' ability to evoke rule-governed behaviors concerning current contingencies will come forward more clearly.

The generalization from studies to Growth mindset culture

Carol Dweck and colleagues have suggested that different performance aspects (e.g., innovation, learning, successful team performances) will improve when organizations develop a growth mindset culture (Dweck, 2006) where members see intelligence and ability as malleable and minimize beliefs about abilities as fixed or uncontrollable (Zeeb, Ostertag et al., 2020). The suggested benefit for performance levels of establishing a growth, rather than a fixed culture is derived from findings indicating that growth mindset correlates with more positive behavioral outcomes related to aspect of performance than that of a fixed mindset (Dweck, 2006; Dweck, & Yeager, 2019; Murphy, & Dweck, 2009). Dweck and colleagues have conducted studies to investigate organizational mindsets and correlations to aspects of cultural norms, employee satisfaction, and performance (Canning, Murphy et al., 2020). They suggest that in a fixed mindset organization, employees are rewarded when displaying their abilities, and often compete for status. In a growth mindset organization, employees are rewarded for learning and effort when developing abilities.

The shift from individual or group growth mindset interventions towards the idea of changing cultures can also be seen in relation to varying results of effect size of the interventions, and to heterogeneity in the groups that benefit from the interventions. Two meta-analyses, by Sisk and colleagues, showed that the group that might benefit from growth mindset interventions were heterogeneous (low social-economic status and lower grades), and they reported findings of low effect size across interventions (Sisk, Burgoyne et al., 2018). Other concepts and theories have been integrated into the idea of the growth mindset culture. The concept of psychological safety (Edmondson, 1999) has been described as an important factor for team performance and innovation in organizations (Baer, & Frese, 2003), in

learning (Edmondson, 2018), and risk-taking (Rozovsky, 2015). Psychological safety is defined by Edmondson as “a shared belief held by members of a team that the team is safe for interpersonal risk-taking” (Edmondson, 1999, p. 1). In addition, the concept “Grit” coined by Duckworth (2007) has recently been studied as part of the growth mindset idea (Kench, Hazelhurst et al., 2016; Metcalf, 2021; Park, Tsukayama et al., 2020). Grit, defined as “passion and perseverance for long-term goals” is suggested as a personality trait that can predict long-term success (Duckworth, Peterson et al., 2007). The concept has started to generalize towards the organizational context, much like the concept of growth mindset, where the suggestion is that grit is instrumental in work-context and to long-term goal achievement (Eskreis-Winkler, Shulman et al., 2014; Jordan, Ferris et al., 2019). It should be mentioned that research between grit and performance outcomes in organizational research is still inconclusive (Jordan, Ferris et al., 2019). The inclusion of the concepts of grit and psychological safety can influence the type of factors that are included in questionnaires when measuring levels of growth mindset culture.

Behavioral interpretation

Growth mindset culture, including the concepts of grit and psychological safety, is measured with questionnaires and assumed to correlate with aspects of performance and achievements at the group level. “The third level of selection by consequences, the evolution of social environments” (Skinner, 1981, p. 502) is relevant when interpreting growth or fixed cultures. Practices are selected if they at some points have been successful in solving challenges for a group (Skinner, 1981). Even when practices in organizations are selected, this does not necessarily translate to successful problem-solving if the external environment is changing (Sandaker, Andersen et al., 2014). For instance, punishing contingencies that reduce behavioral variety in organizations is not necessarily efficient when confronted with new challenges in a highly technological and interconnected world (Sandaker, Andersen et

al., 2014). Still, at some point in history, constraining novel behaviors must have been reinforced (Skinner, 1981).

A growth mindset culture is in place when efforts to develop abilities, rather than displaying abilities are rewarded, where, again growth mindset is suggested as the causal variable setting up these behaviors (Dweck, & Yeager, 2019). Changing relevant contingencies in an organization can be problematic without functional analysis. Cultural selection left undisturbed, is frequently slower than the selection of operant behaviors at the individual level (Skinner, 1981). If significant correlations between growth mindset culture and desirable performance are found, this can indicate that specific behavioral contingencies at work in an organization reinforce behaviors that can produce desired outcomes - innovation, risk-taking, learning (Daniels, & Bailey, 2014b; Sandaker, 2009). If similar correlations are found between fixed mindset cultures and inferior performance, maybe some practices that have been selected at some points are no longer effective in meeting new challenges. When growth and fixed mindset are applied as descriptions for current contingencies in an organization in the same way that the concept is applied on the individual level, inferences about potential causal relationships are tenuous.

Early on, Dweck and other researchers discussed environmental events as potential causal variables for setting up different implicit theories in children (e.g. overt behavioral cues from parents when reacting to children's failure and success, teachers praise or punishment contingent on different behaviors) (Dweck, & Leggett, 1988; Yeager, & Dweck, 2020). The interpretation from a behavioral perspective is that "growth mindset culture" is a return to environmental variables as causal factors for potential change but described in accordance with the ontological and epistemological assumptions of cognitive science. There are no standardized growth mindset interventions, neither at the individual nor at the organizational level. Practitioners and researchers are developing measurement tools to

investigate levels of growth mindset cultures, and interventions designed to induce higher levels of a growth culture (Derler, 2020; Dweck, 2006; Yeager, & Dweck, 2020). The benefit of identifying factors that can evoke rules about the current contingencies is that this can provide information about the contingencies that are operating in an organization.

Interventions that aim at increasing a performance aspect in an organization require that a meaningful relationship between measurement tools and the specific goal for the intervention is established (Daniels, & Bailey, 2014b). The goal of demonstration of control can be met when investigating if a behavioral outcome (e.g., a performance aspect, result) is a function of the intervention. By measuring behavioral outcomes in conditions, with and without the introduction of the intervention (e.g., A-B, reversal designs, multiple baseline designs) it is possible to establish or rule out functional relations between the variables (Daniels, & Bailey, 2014a).

The behavioral analytic analysis of responses to growth mindset questionnaires, interprets such responses to be participants' verbal descriptions of current contingencies and individual learning history (Skinner, 1957a). In contrast to measure levels or types of mindset by asking participants about contingencies that may or may not be relevant to a specific goal or domain, identifying factors able to evoke rule-governed behaviors for relevant contingencies may be more efficient when aiming for behavioral change. Knowledge about the target contingencies and present performance level can allow for demonstration of control between an intervention and later behavioral outcome. The thesis examined:

RQ 1) Is there a correlation between high levels of growth mindset culture and a higher KPI?

RQ 2) Are there any specific factors that statistically predict a higher KPI?

Method

Participants

162 employees and 10 supervisors from 13 stores under the same chain were recruited by a consulting firm to participate in a growth mindset survey. All the participants were over 18 years and consented to participate in the anonymized survey. Questions providing information about individual job descriptions or employee classification were not included in the survey. The average store size (excluding supervisors) was 16 employees, with the smallest store consisting of 9 and the largest of 30 employees (SD= 7,367). The average number of participants responding to the survey (excluding supervisors) was 12 employees, with the lowest response rate of 6 and highest of 24 employees (SD= 5,410). The supervisor's responses to the survey were excluded due to the lack of participation in the survey in 3 of the 13 stores. The individual data provided from the consulting firm to the author of the thesis was anonymized. In addition, the growth mindset survey was applied without the influence or involvement of neither students nor Oslomet (see Appendix: Reflection note on ethical considerations regarding data).

Material

The "Growth mindset Index" (GMI) was designed by the consulting firm to measure the level of Growth or Fixed mindset culture in companies. The GMI is a measurement tool where participants score their level of agreement with 25 statements related to behavior in their store on a 7-point Likert scale. The values of growth mindset culture range from -100 to 100%. In contrast to some other mindset surveys that often measure the level of agreement to claims about intelligence as fixed or malleable, the GMI includes statements asking participants about observable behaviors. The GMI is composed of 5 factors consisting of 5 items: Psychological safety, Communication, Motivation and endurance, Curiosity and support of new ideas and Learning conditions. The factors will be described below.

Psychological safety

This factor intends to measure behaviors related to the construct of psychological safety, an integrated part of growth mindset culture. Some examples of items that are suggested to measure the construct are: C) «I vår butikk sier vi det vi mener, uttrykker uenighet, tar opp dårlige nyheter og stiller kritiske spørsmål, uten frykt for å dumme oss ut, bli avvist eller oppfattet som negative». D) «I vår butikk sier vi fra hvis vi ikke forstår eller har problemer, og spør om hjelp uten frykt for å fremstå som lite kompetente».

Communication

Different ways of operationalizing the concept of communication, as for example Organizational communication (Arif, Jan et al., 2009) and Organizational communication climate (Lantara, 2019) have been correlated with different types of performances, in line with the growth mindset idea. Some examples of the items suggested to measure communication are; F) “Vår butikksjef lytter aktivt ved å være nysgjerrig, stille oppklarende spørsmål og ha øyekontakt med oss vi snakker» G) «I vår butikk får ingen dominere, heller ikke lederen når vi diskuterer. Alle slipper til omtrent like mye med sine argumenter og synspunkter».

Motivation and endurance

The factor intends to capture behaviors related to the concept “Grit”. Some examples of items suggested to measure motivation and endurance is; K) “Vår butikksjef er ambisiøs og pusher oss til å nå mål og løse problemer utenfor komfortsonen, selv om det er ubehagelig og vi kan mislykkes» O. «I vår butikk bortforklarer eller skylder vi aldri på andre når vi feiler, opplever motgang eller ikke når våre mål, men vi tar ansvar og lærer av de feil vi gjør».

Curiosity and support of new ideas

Growth mindset culture in an organization is suggested to improve innovation and some researchers are finding correlations between curiosity and innovation in organizations (Çelik, Storme et al., 2016). Examples of items suggested to measure curiosity and support are; P. “I vår butikk er det å komme med ideer til forbedringer sett på som en viktig del av det daglige arbeide». Q. «I vår butikk kommer det mange nye ideer til forbedringer.»

Learning conditions

The items within the last factor records employee’s descriptions of contingencies in relation to the efficiency of processes, routines, and contingent feedback from supervisors. Examples of items are; U. I vår butikk har vi definert tydelige og effektive prosesser og rutiner for alle viktige områder slik som service, salg og drift. Y. Vår butikksjef gir oss ofte ros og anerkjennelse for målrettet og fokusert arbeidsinnsats, og at vi ikke gir oss før vi lykkes.

Procedure

A consultant recruited stores to participate in the growth mindset survey by presenting information about a research project aiming to investigate the relationship between growth mindset culture and performance level. The GMI was then distributed from the consulting firm to the employees’ through text messaging. Instruction provided to employees before responding to the factors in the GMI was: «Når du svarer på påstandene under skal du tenke på hvordan du har det i din butikk. Det finnes ikke et rett eller galt svar. Les den enkelte påstand og svar basert på din SUBJEKTIVE OPPLEVELSE OG ERFARING. Vær ærlig og kritisk, og svar det du føler er riktig uten å tenke for mye. Svarene gis på en skala fra 1 til 7, hvor 1=helt uenig og 7=helt enig. Er du tvil om hva du skal svare på en påstand eksempelvis 4 eller 5 skal du alltid svare det laveste, altså 4. Det tar deg 3-5 minutter å svare, og svarene er ANONYME». The consulting firm conducted the survey and collected data intending to investigate correlations between levels of growth mindset culture and a target Key

Performance Indicator (KPI) - percentwise change of income over the last three years for the individual stores. The main hypothesis was that high levels of growth mindset culture would correlate with a high target KPI. The total percent of growth mindset culture in each store, individual data of responses to the GMI, and numbers of income from the last three years for each store were provided by the consulting firm to the author of the present thesis. In addition to the main hypothesis, it was decided to include a second research question investigating the statistical connection between factors and target KPI that would otherwise be overlooked. The alpha level for all statistical tests was $\alpha = .05$.

Data analysis

Research question 1.

The percentage of growth mindset culture in the 13 stores was provided from the consulting firm to the author and functioned as the independent variable in the statistical test. The procedure to calculate the level of growth mindset culture in the stores is by converting responses from the Likert scale to percent. To do this all responses between 1- 4 were subtracted from the scores between 6-7 (5 is removed from the dataset) for each item. If 6 out of 10 employees responded with 1-4 and 4 employees responded from 6-7, the calculation for that item would be $60\% - 40\% = 20\%$. This procedure was conducted for each item in the factor and then divided by five again to find the percentage for the factor as a whole. Percentages for each factor were then added together and divided by five to find the total percentage of growth mindset culture. The dependent variable, target KPI was calculated by subtracting the most recent income from initial income, dividing it by initial income, and multiplying by 100 ($\frac{(V_2 - V_1)}{V_1} \times 100$). Both a Spearman rank correlation and a Pearson's product-moment correlation coefficient were computed, due to the non-normal distribution of the data and small sample size. The results from the two statistical tests did not show any significant difference.

Research question 2.

Five simple regression analyses were computed to investigate which factors might predict a higher KPI. The goal was to identify statistical connections between factors and KPI that might otherwise be overlooked. For example, the score on items within *psychological safety* might correlate to a higher target KPI than for example the items within *communication*. The factors contain descriptions of behavioral contingencies within each store. Information about a statistical connection between singular factors and KPI was thought to provide indications to what type of descriptions of contingencies could be relevant for this KPI. The variables in the statistical tests included the individual responses to the factors from each store. Responses to “five” on the Liker scale were also included. It was decided to include five, since there was no explicit statement provided in the instructions to participants indicating that five means something else than other numbers on the scale. The individual data were used to compute means for each factor in each store, functioning as the independent variable and KPI as the dependent variables in the regression analysis.

Cronbach Alpha coefficient

A Cronbach Alpha coefficient was computed to test scores on internal consistency across items within each factor. Individual scores on each item, including supervisors scores were included in the reliability test.

Results

A Pearson’s product-moment correlation coefficient was computed using SPSS to assess a relationship between Growth mindset culture and a higher target KPI in the thirteen stores, table 1 provides information about the level of growth mindset culture and KPI for each store. A weak-positive non-significant correlation between Growth mindset culture and high target KPI was found ($r = 0.158, N = 13, p > 0.05$). This indicates that for this sample of

stores there was no strong relationship between growth mindset culture and higher percent income. The descriptive statistics including p value are presented in table 2.

The linear regression analyses computed in SPSS was used to assess whether there was any indication as to which factor could statistically predict KPI. In table 3 the computed means for each factor in relation to the store is presented. For factor “Psychological safety” the results from the regression analysis suggests that this factor explains 1,9% of the variance, $R^2 = .019$, $F(1, 11) = .214$, $p = .653$. Psychological safety did not significantly predict KPI, $B = 3,46$, $t = .46$, $p = .653$. For the factor “Communication” the results suggest that this factor explains 0,9% of the variance, $R^2 = .009$, $F(1, 11) = .103$, $p = .754$. Communication did not significantly predict KPI, $B = 2,27$, $t = .32$, $p = .754$. For “Motivation and endurance” the results suggest that this factor explains 3,3% of the variance, $R^2 = .033$, $F(1, 11) = .373$, $p = .554$. Motivation and endurance did not significantly predict KPI, $B = 4,97$, $t = .61$, $p = .554$. For subscale “Curiosity and support of new ideas” the results suggest that this factor explains 1,6% of the variance, $R^2 = .016$, $F(1, 11) = .184$, $p = .676$. Curiosity and support of new ideas did not significantly predict KPI, $B = 3,05$, $t = .43$, $p = .676$. For the last factor “Learning conditions” the results suggest that this category explains 12,8% of the variance, $R^2 = .128$, $F(1, 11) = 1.610$, $p = .231$. Learning conditions did not significantly predict KPI, $B = 10,65$, $t = 1,27$, $p = .231$. Tables 4 - 8 contain description of the regression Coefficient of each of the factors on KPI (IBM SPSS, 2020).

A Cronbach Alpha was computed using SPSS to assess internal consistency across items within the factors. The dimensions of the factor “Psychological safety” demonstrated strong internal consistency, with a reliability of the factor score of ($\alpha = .86$). Similar results for the factor “Communication” ($\alpha = .89$). The factor “Motivation and endurance” showed a lower score on internal consistency ($\alpha = .68$), if the last item (O.) is removed, the coefficient alpha would increase to ($\alpha = .84$). A high internal consistency score was also found in the

factors “Curiosity and support of new ideas” ($\alpha = .89$) and for “Learning conditions” ($\alpha = .87$).

Table 9 provides the details for each factor score and threshold.

Discussion

The results generated by the computed Pearson’s product-moment correlation coefficient to answer research question 1, shows a non-significant correlation between total scores in the growth culture and target KPI. When testing for correlations between factors to answer research question 2, the simple linear regressions analyses computed show non-significant relationships between singular factors and prediction of a higher KPI. The estimate of reliability indicates a high internal consistency within all factors. The results generated from testing the main hypothesis; “Is there a correlation between high levels of growth mindset culture and higher KPI?” could in accordance with the scientific goal of cognitive science be; 1) a non-significant relationship between growth mindset culture and KPI was found in this sample, 2) there is a non-significant relationship between growth mindset culture and this specific KPI, and 3) the GMI is potentially not measuring the phenomena it sets out to measure. These types of inferences of relations between non-manipulated variables can be contrasted with a scientific goal including demonstration of control (Skinner, 1953).

The reason for computing the additional regression analysis was to reveal individual responses to the factors that would otherwise be overlooked. Whether outcomes of the statistical tests were significant or not, was not the main interest; that was to see if it was a difference between contingencies measured in the factors and KPI. The factors in the GMI contain descriptions of different sets of contingencies in the stores, and the level of agreement or disagreement was thought to indicate what types of contingencies were more or less relevant to the selected KPI. The GMI used to investigate levels of growth mindset culture is interpreted as a measurement tool that targets participants’ rules, rather than growth mindset

per se. Neither of the five factors could significantly predict KPI, but when looking at differences between the other factors and “Learning conditions” there is a stronger correlation between the scores in this subscale in the 13 stores and the KPI. The items in this factor do ask more precisely about employee’s rules about specific contingencies (e.g., processes, routines, contingent feedback, improvement areas). Some other questionnaire items contain several contingencies. For example item C in factor Psychological safety.; «I vår butikk sier vi det vi mener, uttrykker uenighet, tar opp dårlige nyheter og stiller kritiske spørsmål, uten frykt for å dumme oss ut, bli avvist eller oppfattet som negative». This can create potential challenges when one wants to assess precise descriptions of contingencies through employees’ verbal behavior.

There are several ways of improving questionnaires. One way can be the grouping of items into factors that include descriptions of relevant contingencies for specific goals. If a goal in an organization is to increase the number of projects completed within deadlines some examples of items that can evoke rule-governed behavior for relevant contingencies could be: “The time limits to complete projects are within my team’s capacity” “In my team, we usually put in the same amount of hours to finish a project to reach deadlines” “When we reach deadlines, we as a team are praised for that accomplishment” “Individual team members are praised when they have put in extra effort to reach a deadline”. Regarding applied procedures for behavioral change and demonstration of relationships between intervention and behavioral outcomes in organizational contexts, there are sufficient evidence-based methods found within Organizational Behavioral Management, and especially its subcategory Performance Management.

To meet the assumption of unidimensionality when using Cronbach alpha as an indicator of internal consistency, factor analysis, whether exploratory factor analysis or confirmatory analysis, should be performed on all factors, to make sure that the assumption is

not violated (Tavakol, & Dennick, 2011). Since the Cronbach alpha is a correlation of the scale with itself, potential factors in the GMI could measure multiple dimensions and still show a high alpha value (Tavakol, & Dennick, 2011). When alpha values are high ($> .90$) it may be a result of redundant items; questions asking about the same thing but phrased in a slightly different way (Tavakol, & Dennick, 2011). Further correlation analysis might be appropriate to exclude potential redundant items in the GMI, in addition to performing factor analysis. Regarding the predictive validity of the GMI, the low, non-significant correlations between subscales and KPI and level of growth mindset and KPI indicate weak predictive validity of GMI for the criteria (KPI). Knowledge about the predictive validity of the GMI's ability to predict a higher or lower percent change in income for stores is limited when the results are generated from a small sample size. To know if the GMI can predict the target KPI, it must be systematically tested over time to this criterion (Neuman, 2014b).

It should be mentioned that two stores in the sample could have been excluded if information about internal conditions for the stores (reducing target KPI deliberately and change of supervisor in the store) were provided before the statistical results were confirmed. A Pearson's correlation coefficient, including changes in the data was computed to see if the changes would influence the correlation coefficient and p value. The additional Pearson's correlation coefficient did confirm a high significant correlation between level of growth mindset culture and higher KPI. Minor changes and selection of stores in a sample of this size, with the use of only one type of statistical test, can influence inferences about relationships between the independent and the dependent variable and pose a potential threat to statistical conclusion validity (Neuman, 2014a). Experimental and correlational designs, assuming causal relationships between variables, without including demonstration of control, are more vulnerable to confounding variables that can pose a threat to internal validity (Shadish, 2001). Possible confounding variables explaining correlations between growth

mindset and performance could be past and current socio-economic conditions, learning history, and current punishing or reinforcing contingencies for the relevant behaviors. Growth mindset (as a construct) and its ability to predict higher academic achievement or other performance aspects across contexts are inconsistent. Some studies report contradictory results (Sisk, Burgoyne et al., 2018) and others support evidence of correlations with academic and other performances (Blackwell, Trzesniewski et al., 2007; Costa, & Faria, 2018; Yeager, Johnson et al., 2014). The scientific evidence for the further generalization of the growth mindset theory towards the organizational context is not quite clear.

Limitations and future research

The non-significant correlations generated are not interpreted as evidence of a non-existing relationship between specific behavioral contingencies and consequences (e.g., performance); such a relationship may indeed exist, but it needs to be demonstrated. To know more about the relationship between behavioral contingencies and high or low percent change in income, it's crucial to have information about current contingencies related to this specific aspect of the store (Daniels, & Bailey, 2014b). The current thesis does not offer an alternative measurement tool to target employees' rules in relation to contingencies, since the development of measurement tools needs to be seen in a relationship to what is under investigation and why. Regardless of the limitation in this thesis, procedures aiming at measuring behaviors, in the organizational context already exist within the field of Organizational Behavior Management. In addition, procedures that aim for behavioral change in organizations, including demonstration of control are a big part of the subcategory Performance Management. All of the described elements can be subjects for future research in the area of growth mindset theory and growth mindset culture.

Conclusion

The observational basis for both cognitive psychology and behavior analysis is behavior, but different emphasis is placed on external variables to the behavior, and separate scientific goals lead to different interpretations (Hayes, & Brownstein, 1986). The behavioral perspective is presented through interpretation of early studies on growth mindset and of growth mindset culture. This interpretation is suggested to be of benefit as a complementary perspective for researchers and practitioners concerning measurement tools and interventions within the field of growth mindset culture. Information about contingencies can be a first step towards empirically testing effect of interventions on behavioral outcomes (Daniels, & Bailey, 2014b). The Growth Mindset Index (GMI) is interpreted to evoke rules about the contingencies described in the 5 factors. Regarding its predictive validity to the target criteria (KPI), it would need to be systematically tested over time and preferably with larger samples, and variations in types of organizations. Vulnerabilities regarding internal and predictive validity for construct generated from experiments and correlational studies, without concerns for demonstration of control, are discussed. One solution to this, specifically in relation to growth mindset interventions in organizational contexts is to empirically test if a performance level is a function of an intervention. To do that, measurement tools should be consistent with contingencies experienced by employees and goals set by the organization.

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Table 1*Percent of growth mindset culture and KPI*

Store No.	GMI(%)	KPI(%)
1.	76	23
2.	59	36
3.	50	27
4.	45	27
5.	39	-1
6.	33	41
7.	31	28
8.	28	9
9.	21	34
10.	12	20
11.	10	38
12.	4	4
13.	0	22

Note. Calculations of Growth mindset culture (GMI(%)), was conducted by the consultant firm. KPI(%) was calculated by subtracting most recent income from initial income, dividing it by initial income and multiplying by 100.

Table 2*Descriptive statistic and significance for variables GMI and KPI*

Variable	<i>n</i>	M	SD	1	2
1.GMI	13	31,38.	22,42	1	.605
2.KPI	13	23,69	13,01	—	1

Table 3*Computed mean score in each factor in stores and KPI.*

Store No.	Psychological safety(M)	Communication (M)	Motivation/ endurance(M)	Curiosity/ support(M)	Learning conditions(M)	KPI (%)
1.	6.30	6.48	6.52	6.50	6.06	23.00
2.	5.86	6.10	5.98	6.12	5.90	36.00
3.	5.74	6.32	5.80	5.82	5.24	27.00
4.	5.48	5.74	5.92	5.73	5.63	27.00
5.	5.50	5.65	5.56	5.96	5.03	-1.00
6.	5.47	5.31	5.65	5.73	5.57	41.00
7.	5.26	5.21	5.49	5.79	5.61	28.00
8.	5.10	5.02	5.13	5.20	4.90	9.00
9.	5.35	4.95	5.25	4.73	5.10	34.00
10.	5.18	5.38	5.52	5.25	4.85	20.00
11.	4.44	4.86	4.82	5.18	4.74	38.00
12.	4.67	4.83	4.94	4.76	5.01	4.00
13.	4.64	5.20	5.09	4.93	4.84	22.00

Note. All computed means are composed of individual scores, including “5” to items within factors. The means represent the average score on each factor in distinct stores.

Table 4.

Regression Coefficient of factor Psychological Safety on KPI

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.343	39.880		.134	.896
	Psyc. Safety	3.458	7.482	.138	.462	.653
	<i>R</i> ²	.019				

Note. Psyc. Safety = Psychological safety.

Table 5

Regression Coefficient of factor Communication on KPI

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	11.28	38.766		.291	.776
	Comm.	2.271	7.060	.097	.322	.754
	<i>R</i> ²	.009				

Note. Comm= Communication.

Table 6

Regression Coefficient of factor Motivation and Endurance on KPI

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.683	44.966		-.082	.936
	Motivation	4.966	8.129	.181	.611	.554
	R^2	.033				

Note. Motivation= Motivation and endurance.

Table 7

Regression Coefficient of factor Curiosity and support of new ideas and Endurance on KPI

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.894	39.338		-175	.864
	Curiosity	3.046	7.100	.128	.429	.676
	R^2	.016				

Note. Curiosity= Curiosity and support of new ideas.

Table 8.*Regression Coefficient of factor Learning conditions on KPI*

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-32.385	44.334		-.730	.480
	Learning	10.646	8.390	.357	1.269	.231
	R^2	.128				

Note. Learning= Learning conditions.

Table 9*Cronbach Alpha scores for items within factors*

Subscale	No. Items	Threshold (< 10 items)	Cronbach alpha
Psyc. Safety	5	> .50	.864
Communication	5	—	.894
Motivation	5	—	.680*
Curiosity-Support	5	—	.894
Learning Conditions	5	—	.869

Note. .680* = If item O. is removed the Cronbach alpha for subscale “Motivation and endurance” would increase to $\alpha = .840$

Appendix

Reflection note: Ethical considerations in relation to data

We initially applied for approval through NSD (Norsk Senter for forskningsdata) before any data was received from the consulting firm. We were made aware that the application and approval from NSD were irrelevant since the survey was planned and conducted by the consulting firm without the participation of students or involvement of Oslomet and since only anonymized data was to be received. The employees were anonymized by the consulting firm, giving each respondent a random number. The random number was connected to the store the employee works in. The level of growth mindset culture for each store is not regarded as personal information and income for the anonymized stores are accessible through publicly available websites, like www.proff.no.

Notification form: 609442

NSD NORSK SENTER FOR FORSKNINGSDATA

Meldeskjema 609442

Sist oppdatert

01.02.2021

Hvilke personopplysninger skal du behandle?

Type opplysninger

Skal du behandle særlige kategorier personopplysninger eller personopplysninger om straffedommer eller lovovertridelser?

Nei

Prosjektinformasjon

Prosjekttittel

Growth mindset: kultur, biologi og læring

Prosjektbeskrivelse

Data fra en forretningskjede, på aggregert nivå for enkeltfilialer. Personvernrådgiver fra OsloMet anbefaler at det etableres en dataoverføringsavtale.

Dersom opplysningene skal behandles til andre formål enn behandlingen for dette prosjektet, beskriv hvilke

Analyse av sammenhenger mellom data fra spørreundersøkelser og økonomiske resultater i filialer i en større kjede av detaljforretninger.

Begrunn behovet for å behandle personopplysningene

Teoretisk drevet studie med sikte på å teste hypotese om korrelasjon mellom såkalt growth mindset-kultur

(målt ved spørreundersøkelser gjennomført anonymt ved den enkelte filial) og forretningsmessig suksess(bunnlinje per filial).

Ekstern finansiering

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Esnath Julius Mwaiselage, s313108@oslomet.no, tlf: 94145550

Behandlingsansvar

Behandlingsansvarlig institusjon

OsloMet – storbyuniversitetet / Fakultet for helsevitenskap / Institutt for atferdsvitenskap

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Gunnar Ree, gree@oslomet.no, tlf: 91607580

Skal behandlingsansvaret deles med andre institusjoner (felles behandlingsansvarlige)?

Nei

Utvalg 1

Beskriv utvalget

Ansatte i ulike butikker fra to forskjellige kjeder

Rekruttering eller trekking av utvalget

Rekruttert via presentasjon av forskningsprosjektet for ledelsen i ulike selskaper. Dataene er samlet inn fra de selskapene som har ulike butikker, dvs at det er alle ansatte i disse butikkene som er valgt ut. Alder

18 - 70

Inngår det voksne (18 år +) i utvalget som ikke kan samtykke selv?

Nei

Personopplysninger for utvalg 1

Hvordan samler du inn data fra utvalg 1?

Elektronisk spørreskjema

Grunnlag for å behandle alminnelige kategorier av personopplysninger

Samtykke (art. 6 nr. 1 bokstav a)

Informasjon for utvalg 1

Informerer du utvalget om behandlingen av opplysningene?

Ja

Hvordan?

Skriftlig informasjon (papir eller elektronisk)

Tredjepersoner

Skal du behandle personopplysninger om tredjepersoner?

Nei

Dokumentasjon

Hvordan dokumenteres samtykkene?

- Elektronisk (e-post, e-skjema, digital
- signatur) Manuelt (papir)

Hvordan kan samtykket trekkes tilbake?

De ansatte innenfor de ulike kjedene har kontakt med ledelsen angående dette. Hvordan kan de registrerte få innsyn, rettet eller slettet opplysninger om seg selv?

Gjennom kontakt med ledelsen for den kjede de er ansatt i.

Totalt antall registrerte i prosjektet

100-999

Tillatelser

Skal du innhente følgende godkjenninger eller tillatelser for prosjektet?

Behandling

Hvor behandles opplysningene?

- Private enheter

Hvem behandler/har tilgang til opplysningene?

- Student (studentprosjekt)
- Databehandler
- Andre med tilgang til opplysningene

Hvilken databehandler har tilgang til opplysningene?

Nudgeit

Andre som har tilgang til opplysningene

Jon Ivar Johanesen

Tilgjengeliggjøres opplysningene utenfor EU/EØS til en tredjestat eller internasjonal organisasjon?

Nei

Sikkerhet

Oppbevares personopplysningene atskilt fra øvrige data (koblingsnøkkel)?

Ja

Hvilke tekniske og fysiske tiltak sikrer personopplysningene?

- Opplysningene anonymiseres fortløpende
- Varighet

Prosjektperiode

01.01.2021 - 15.06.2021

Skal data med personopplysninger oppbevares utover prosjektperioden?

Nei, data vil bli oppbevart uten personopplysninger (anonymisering)

Hvilke anonymiseringstiltak vil bli foretatt?

- Annet

Har kun anonymisert data i utgangspunktet, ingen personopplysninger. Vil de registrerte kunne identifiseres (direkte eller indirekte) i oppgave/avhandling/øvrige publikasjoner fra prosjektet?

Nei

Confirmation NSD

SV: Hei angående samtykke-skjema og anonymiserte data

🕒 Du svarte on. 03.02.2021 13:26.

LR

Lasse Andre Raa <Lasse.Raa@nsd.no>

on. 03.02.2021 12:50

Til: Du

Kopi: postmottak@nsd.no

↩ ↶ → …

Hei igjen

Takk for oppklaring. Ja, det forandrer alt. Det må skilles klart mellom behandlingsaktiviteter som skjer for forskningsformålet (studentprosjektet), med studiestedet som behandlingsansvarlig, og de behandlingsaktiviteter som skjer for andre formål, med en annen behandlingsansvarlig. Dersom dataene allerede er innhentet fra før av konsulenten/bedriften, har studentprosjektet/studiestedet ingen rolle i dette. Konsulenten/bedriften vil være behandlingsansvarlig, og må påse at det finnes lovlig grunnlag for registreringen av personopplysninger samt for utleveringen til studentprosjektet.

Spørsmålet blir dermed om det på noe tidspunkt behandles personopplysninger for forskningsformålet (studentprosjektet). Dersom dataene studentprosjektet mottar er anonyme, noe som fremstår realistisk, faller prosjektet utenfor personvernlovverkets virkeområde, ettersom det ikke behandler personopplysninger. Det vil altså ikke være nødvendig å melde prosjektet til NSD.

Med vennlig hilsen

Lasse Raa

Seniorrådgiver | Senior Adviser

Seksjon for personverntjenester | Data Protection Services

T: (+47) 55 58 20 59

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