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Understanding and Influencing Behaviors in Labor Markets: Impact of Mindset

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Dissertation Abstract

This thesis aims to contribute to the literature in behavioral science by investigating the influence of implicit theories, or "mindsets", on workplace behaviors. Mindsets are beliefs about whether a particular attribute is fixed or malleable, and this thesis explores their impact on feedback-seeking behaviors, humility, proactivity, delegation and willingness to learn, when at work.

Chapter 1 of the thesis examines the relationship between a growth mindset of intelligence (i.e., the belief that abilities can be developed) and feedback-seeking behaviors in a corporate environment. While prior research has explored the variations between a fixed mindset (i.e., the belief that abilities are fixed) and a growth mindset in feedback processing, there is still no established connection between a growth mindset and feedback-seeking behaviors. Moreover, this chapter investigates the mediating impact of intellectual humility of one's manager on this relationship. The chapter presents findings from two field studies conducted in a corporate context, which indicate a positive correlation between a growth mindset and feedback-seeking behaviors. However, the intervention created to induce a growth mindset failed to demonstrate any impact on feedback-seeking behaviors and intellectual humility as anticipated. Despite not obtaining the expected outcomes, this research offers valuable insights into the potential limitations of mindset interventions in modifying behaviors associated with feedback seeking and intellectual humility in corporate settings.

Chapter 2 investigates how beliefs about the malleability of proactivity and delegation, referred to as proactive and delegation mindsets, respectively, influence workplace behaviors. A field experiment was conducted with employees from a business organization who received proactive and/or delegation mindset interventions. The results indicate that a proactive growth mindset (i.e., the belief that proactivity can be developed) is positively related to proactive self-efficacy and positive attitudes towards proactivity. Similarly, a delegation growth mindset (i.e., the belief that delegation can be improved) is correlated with delegation self-efficacy, reported delegation behavior, and positive attitudes towards delegation. Although the interventions aimed at increasing proactive and delegation growth mindsets did not yield the expected outcomes, this study suggests that growth mindsets can facilitate proactivity and delegation in the workplace. Moreover, this study offers valuable insights into the potential constraints of mindset interventions in a corporate environment.

Chapter 3 focuses on examining the effectiveness of growth mindset interventions in pro-

moting job seekers' willingness to learn. The chapter starts by reviewing the training programs that are currently proposed to unemployed individuals to help them find work. It then presents a study aimed at promoting growth mindsets related to intelligence and interest among job seekers, with the objective of increasing their willingness to learn and participate in training programs. However, the study's findings were inconclusive, and further research should include more controlled trials to test the design's effectiveness. The chapter concludes by discussing the potential benefits of successful intervention, including increased attendance at training programs and greater belief in the ability to find employment, which could have significant implications for reducing unemployment. If successful, mindset interventions have the potential to be valuable tools for public policymakers due to their short duration and ease of implementation.

The findings of this thesis provide valuable insights into the role of mindsets in organizational behaviors and the potential and limits of mindset interventions to promote positive outcomes.

Key-words: Mindsets, wise interventions, implicit theories, business organizations

Résumé de la Thèse

Cette thèse vise à contribuer à la littérature en sciences comportementales en examinant l'influence des théories implicites, ou "états d'esprit", sur les comportements en milieu professionnel. Les "états d'esprit" sont des croyances quant à la malléabilité d'un attribut particulier, et cette thèse explore leur impact sur les comportements de recherche de feedback, l'humilité, la proactivité, la délégation et la volonté d'apprendre, dans le monde du travail.

Le chapitre 1 de la thèse examine la relation entre l'état d'esprit de croissance lié à l'intelligence (i.e., la croyance selon laquelle les compétences peuvent être développées) et les comportements de recherche de feedback dans un environnement professionnel. Bien que des recherches antérieures aient exploré les variations entre les états d'esprit fixe (i.e., la croyance selon laquelle les capacités sont figées) et de croissance dans le traitement des feedbacks, il n'existe toujours pas de lien établi entre un état d'esprit de croissance et les comportements de recherche de feedback. De plus, ce chapitre examine l'impact médiateur de l'humilité intellectuelle du manager sur cette relation. Le chapitre présente les résultats de deux études de terrain menées dans un contexte professionnel, qui indiquent une corrélation positive entre un état d'esprit de croissance et les comportements de recherche de feedback. Toutefois, l'intervention visant à induire un état d'esprit de croissance n'a pas démontré d'augmentation sur les comportements de recherche de feedback et l'humilité intellectuelle. Malgré l'absence de résultats attendus, cette recherche offre des connaissances précieuses sur les limites potentielles des interventions d'état d'esprit pour modifier les comportements associés à la recherche de feedback et à l'humilité intellectuelle dans les milieux professionnels.

Le chapitre 2 examine comment les croyances sur la malléabilité de la proactivité et de la capacité à déléguer, appelées respectivement états d'esprit proactif et de délégation, influencent les comportements en milieu professionnel. Une expérience de terrain a été menée auprès d'employés d'une entreprise qui ont reçu des interventions d'état d'esprit proactif et/ou de delegation. Les résultats indiquent qu'un état d'esprit de croissance liée à la proactivité est positivement lié à l'auto-efficacité de proactivité et aux attitudes positives envers la proactivité. De même, un état d'esprit de croissance liée à la délégation est corrélé à l'auto-efficacité de délégation, aux comportements de délégation déclarés et aux attitudes positives envers la délégation. Bien que nous n'avons pas mesuré d'effet des interventions visant à accroître les états d'esprit de croissance proactif et de délégation, cette étude suggère que les états d'esprit de croissance peuvent

favoriser la proactivité et la délégation en milieu professionnel. En outre, cette étude offre des connaissances précieuses sur les contraintes potentielles des interventions d'état d'esprit en milieu professionnel.

Le chapitre 3 se concentre sur l'examen de l'efficacité des interventions basées sur les mentalités de croissance pour promouvoir la volonté d'apprendre des demandeurs d'emploi. Le chapitre commence par examiner les programmes de formation actuellement proposés aux personnes sans emploi pour les aider à trouver du travail. Il présente ensuite une étude visant à promouvoir les mentalités de croissance liées à l'intelligence et à l'intérêt parmi les demandeurs d'emploi, dans le but d'augmenter leur volonté d'apprendre et de participer à des programmes de formation. Cependant, les résultats de l'étude ne sont pas concluants et des recherches supplémentaires devraient inclure des essais contrôlés pour tester l'efficacité du design. Le chapitre conclut en discutant des avantages potentiels d'une intervention d'état d'esprit réussie, notamment une augmentation de la participation aux programmes de formation et une plus grande croyance en la capacité de trouver un emploi, ce qui pourrait avoir des implications significatives pour la réduction du chômage. Les interventions d'état d'esprit ont le potentiel d'être un outil précieux pour les décideurs publics en raison de leur courte durée et de leur facilité de mise en œuvre.

Les conclusions de cette thèse fournissent des informations précieuses sur le rôle des états d'esprit dans les comportements organisationnels et le potentiel et les limites des interventions d'états d'esprit pour promouvoir des résultats positifs.

Key-words: Etat d'esprit, wise interventions, théories implicites, entreprises

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General Introduction

1 Motivation of this Thesis

The purpose of this thesis is to contribute to the behavioral science literature by examining the impact of implicit theories (aka *mindsets*), that is, thinking that an attribute is fixed (i.e., a fixed mindset) or malleable (i.e., a growth mindset) on the way people behave when at work. The chapters of this thesis contribute to the literature by focusing on different mindsets (i.e., intelligence, delegation, proactivity, and interest) and by studying populations that are typically underrepresented in research, specifically working adults and job seekers.

Understanding and influencing behaviors at work is critical in today's changing professional landscape. Mindsets, or individuals' beliefs about the nature of their abilities, have been shown to be powerful predictors of behaviors in educational settings (e.g., Blackwell et al., 2007). For instance, students with a growth mindset are more likely to embrace challenges and persist in the face of setbacks, ultimately leading to higher levels of achievement. On the other hand, those with a fixed mindset are more likely to avoid challenges and disengage when faced with difficulties, ultimately hindering their performance and success (e.g., Burnette et al., 2022). However, mindsets in the workplace are understudied and their consequences are still unclear.

By helping better understand the impact of mindsets on behaviors, this research might lead to interventions and policies that foster positive outcomes in corporate settings. Therefore, this thesis seeks to provide a comprehensive understanding of mindsets and their impact on behaviors, with the ultimate goal of informing decision-making and policy interventions aimed at improving performance and success in the world of work.

Main research questions: While the dissertation comprises three self-contained research papers, they all speak to two overarching research questions: *How do mindsets shape behaviors in the world of work? Then, can you influence mindsets?*

Chapter 1 studies the relationship between a *growth mindset* and *feedback-seeking behaviors*. Previous studies have explored the differences between growth and fixed mindsets in feedback processing, but the existence of a relationship between a growth mindset and feedback-seeking behaviors has not been established yet. Additionally, the chapter investigates the mediating effect of *intellectual humility* on this relationship. Two field studies were conducted in a corporate

setting, and the results showed a positive correlation between a growth mindset and feedback-seeking behaviors. However, the intervention designed to induce a growth mindset did not lead to an increase in feedback-seeking behaviors and intellectual humility. Despite not finding the expected results, this study provides valuable insights into the potential limitations of mindset interventions in changing behaviors related to feedback seeking and intellectual humility.

Chapter 2 studies the impact of *proactive* and *delegation mindsets* (i.e., beliefs regarding the malleability of proactivity and ability to delegate) on workplace behaviors. The study conducted a field experiment in France with employees of a business organization who participated in proactive and/or delegation mindset interventions. Results showed that having a proactive growth mindset is positively associated with proactive self-efficacy and positive attitudes towards proactivity. Similarly, having a delegation growth mindset is correlated with delegation self-efficacy, reported delegation behavior, and positive attitudes towards delegation. Although the interventions tested to increase proactive and delegation growth mindsets did not have the expected effect, this study suggests that growth mindsets can facilitate proactivity and delegation in the workplace. In addition, this study offers valuable insights into the potential constraints of mindset interventions for modifying mindsets within a corporate setting.

Chapter 3 focuses on the impact of a growth mindset on job seekers' *willingness to learn* and whether mindset interventions can be effective in promoting growth mindsets among job seekers. The chapter begins with an examination of existing training programs offered to the unemployed to promote their return to employment. It then proposes one study conducted to promote growth mindsets of intelligence and interest among job seekers to increase their willingness to learn and engage in training programs. However, the inconclusive results of this study suggest that future research should conduct more controlled trials to test the effectiveness of the intervention design. Nonetheless, if successful, interventions promoting growth mindsets could foster job seekers' beliefs in their ability to find employment and increase their willingness to attend training programs. This study holds significant implications for reducing unemployment, as it offers a potentially efficient tool for public policy makers. With a short duration of only 90 minutes and easy deployment through videos, the intervention has the potential to be a valuable resource for promoting job seekers' growth mindsets, encouraging their participation in training programs, and ultimately aiding in their reemployment.

2 How to Influence Behaviors?

Public authorities and organizations have a shared goal of promoting positive behaviors such as encouraging citizenship, improving road safety, promoting collaboration, and fostering professional consciousness. However, the most commonly used influence techniques often turn out to be only moderately effective. As an example, simply implementing new laws or rules may not always be effective since humans tend to resist external pressures according to the theory of psychological reactivity (Brehm, 1966). When individuals feel that their freedom is being

threatened or reduced, they are often motivated to take it back, which may result in resistance to the desired behavior change.

Another common method is about offering incentives and rewards: good grades for students, decorations for soldiers, bonuses for salespeople... Many people think that the carrot is more effective than the stick. In reality, it is not always much better: multiple studies show that extrinsic motivation, (i.e., linked to the expected reward), rather than to the activity itself doesn't result in lasting behavior changes. For instance, Bénabou and Tirole (2003) showed that performance incentives offered by a manager, a teacher, or a parent can adversely impact an agent's (a worker or a child) perception of the task, or of his or her own abilities. Therefore, incentives often turn out to be weak reinforcers in the short run, and negative reinforcers in the long run.

Persuasion is another way to influence behaviors which is used as well through advertising slogans as through the promises of politicians. However, it is not easy to make someone change his or her mind: social psychology research has indeed proven that the more you attack an opinion, the more you reinforce it. This is what Lord et al. (1979) called attitude polarization. Moreover, numerous studies have confirmed that opinions do not always predict behaviors (Dollard, 1948).

Training are also used by organizations to positively influence employee behaviors. Training represent a "major tool" to develop and maintain new skills (Ministère du travail, 2019). However, to be effective, training need to be recurrent (e.g., Childs and Spears, 1986); and this constitutes a certain cost for organizations, individuals and the society (Tsang, 1997). The cost is even higher for one-to-one coaching. While there were approximately 71.000 coach practitioners worldwide in 2019 (i.e., an increase of 33% on the 2015 estimate), the estimated global revenue from coaching was 2.849 billion US dollars (International coaching federation, 2020). Overall, in most cases, usual influence techniques prove either inefficient or costly. Are there more cost-effective ways to change behaviors?

2.1 Using Nudges for Influencing Behaviors

A recent innovation implemented to help citizens to make responsible decisions is nudges (Thaler and Sunstein, 2008). Nudging describes changes in the choice architecture that influences people's choices in a predictable way, while not making any option more costly (i.e., in terms of money, time, or socially). For example, food placement impacts consumer's food selection. Indeed, making healthy options more convenient can reduce how much junk food students eat (Metcalfe et al., 2020). Thus, nudges represent a low-cost way to influence people. How can nudges be effective?

To be effective, nudges identify key decision points or single behaviors that are consequential and can be impacted positively. For instance, in 2003, Johnson and Goldstein (2003) highlighted the role of defaults in determining whether people agree to be organ donors. In this research, respondents were asked whether they would be donors with varying defaults. In one condition,

respondents were told to assume that they had just moved to a new state where the default was not to be an organ donor, and they were given a choice to confirm or change that status. In another condition, the default was to be a donor. Results showed donation rates were twice as high when the default was to be a donor than when it was not to be a donor. Changing the default option encourages greater support for organ donation (Davidai et al., 2012). Without changing the individuals' core beliefs, nudges, including default options, can influence their behaviors. Moving on to the different types of nudges, let's now explore how nudges can take various forms and utilize different techniques to influence behavior.

Nudges can take the multiple forms, including visual or verbal hints. For instance, one way to increase electoral participation is to ask voters questions about "being a voter" instead of "voting" (Bryan et al., 2011). Representing voting as an opportunity to become a valued kind of person increased voter turnout by almost 14%. Nudges can also rely on making a decision easier to make. In order to increase green behaviors, Cosic et al. (2018) tested two treatments. The first one included a sign soliciting participation in a recycling program and a descriptive social norm (i.e., "Almost 70% of Harvard students recycle!"). The second treatment was a combination of the social norm and an "easy to do" nudge, that is, changing the functionality of the bins: they switched the function of the large-garbage-bin to recycling and the function of the small-recycling-bin to garbage, making it easier for subjects to recycle plastic cups. In the first treatment, 36% the cups were recycled. This rate reached almost 100% in the second "easy to do" nudge. However, nudges do not lead to sustainable effects. For instance, although footprints significantly increased stair use in business organizations (Meiden et al., 2019), stair use decreased again once the footprints were removed.

Indeed, in 2015, Kenthirarajah and Walton, described nudges as "snapshot interventions", that is they aim to change behavior in a specific moment in time. Indeed, in another context, the consumer would not choose the healthier meal option or would not recycle their cup. Moreover, people do not significantly change their beliefs about the rightness of organ donation and election voting. Conversely, other interventions target core beliefs. There are called "wise interventions".

2.2 Influencing Behaviors through Wise Interventions

While "snapshot interventions", as nudges, can succeed at modifying behavior during a specific moment or period, "movie interventions" aim to transform core beliefs or other aspects of the self and thereby change people's behavior over time, across different contexts and settings. These interventions are also called "wise interventions". Wise interventions constitute a novel and promising category of initiatives that aim at changing behaviors. They consist of brief interventions that trigger profound and lasting effects on people's beliefs and behaviors in a variety of contexts.

The mechanisms underlying their effectiveness is described by Walton in *the New Science of Wise Psychological Interventions* (2014). As subjective interpretations play a key role in how people behave, wise interventions target a change in a specific psychological processes in order to

help people change their meaning system. Thus, they alter specific meanings to promote change: Wise interventions focus on the "meanings and inferences people draw about themselves, other people, or a situation they are in" and use precise, theory- and research-based techniques to alter these meanings (Walton, 2014, p. 618). To put it differently, wise interventions seek to alter the interpretations and perspectives that individuals adopt, in order to induce changes in their behavior. By modifying the ways in which people make sense of the world around them, wise interventions can influence the attitudes, values, and motivations that drive behavior, and ultimately lead to more positive outcomes. How can brief interventions result in lasting effects?

Unlike teaching a new skill, changing how people understand themselves or a social experience does not generally involve practice or repetition; more is not necessarily better. To change meaning making, wise interventions "offer people new information, place people in new situations, or structure reflection exercises and then allow people to draw new conclusions on their own" (Walton and Wilson, 2018, p. 624). More specifically, there are four types of research-based techniques to change meaning making: direct labeling, prompting new meanings, increasing commitment through action, and active reflection exercises (Walton, 2014). These techniques are described hereafter.

Direct labeling provides people with a positive characterization for an ambiguous aspect of the self, a situation, or others. For instance, when a prisoner's dilemma activity was called "the Community Game" rather than "the Wall Street Game", people cooperated twice more (Liberman et al., 2004). Assigning people a positive label can motivate them to behave accordingly. This can involve labeling oneself, others, or a situation. However, labeling oneself directly may be more effective with children than with adolescents or adults who may react negatively to coercive messages (Yeager et al., 2018). Labels can also backfire if they suggest that a quality is fixed rather than something that can be developed. For example, telling a child they are "so smart" can harm their resilience in the face of setbacks (Mueller and Dweck, 1998).

Another category of wise interventions involves prompting new meanings, wherein the provision of fresh perspectives forms the foundation for a novel way of conceptualizing the self, the situation, or others, without imposing the meaning itself. Such interventions encourage people to reassess their implicit beliefs and "stories" without being told what to think directly (Wilson, 2011). To prompt new meanings, various techniques can be employed such as providing targeted questions, introducing new information, or suggesting actions that can alter the situation. For instance, by cleaning up a neighborhood, it can be implied that violating rules is not acceptable, which in turn may contribute to a reduction in crime rates (Braga and Bond, 2008). Another example of such interventions is the social-belonging intervention (Walton and Cohen, 2011), which aims to alter how students interpret academic setbacks. Through the exposure to testimonies from older students, this intervention assists students in realizing that negative experiences, such as feeling lonely, are common and do not necessarily indicate that they do not belong in college. This change in meaning was found to statistically mediate the academic improvement observed over a three-year period.

A third category of wise interventions consists of increasing commitment through action, as

one effective way to reinforce a new idea is by encouraging individuals to act in accordance with it. The "saying-is-believing" exercise is a prime example of this approach, as it suggests that the more people articulate their positions in their own words, the more likely they are to endorse the message they receive (Higgins and Rholes, 1978). In wise interventions, new information is presented to individuals in a way that aligns with their existing beliefs and values. This fosters a sense of familiarity and resonance, and prompts them to perceive the information as intuitive and self-evident. Once they have internalized the information, individuals are encouraged to share it with others, often by providing advice to those who are less experienced or knowledgeable. Drawing upon their own experiences and using relatable examples, individuals can consolidate their understanding and apply the new insights to their own lives. Another way to encourage commitment through action is by using "pre-commitment", which involves encouraging people to make a commitment to do something before they have the opportunity to do so.

Finally, active reflection exercises represent another kind of wise interventions. These are intentional, structured, brief exercises that are often conducted in writing. These exercises encourage individuals to reflect on their personal experiences from a different perspective or to reinterpret past events. Some exercises emphasize positive qualities, such as ways to think positively about oneself, ways to connect with others, or methods to achieve goals. These exercises help individuals develop these positive qualities. Other exercises focus on negative experiences that can lead to unproductive cycles of negative thoughts and emotions. These exercises aim to help individuals think more clearly and find resolution or positive meaning in these experiences, leading to improved mental health and well-being. Another example of active reflection exercises is value-affirmation, which aims to alleviate psychological threats by reinforcing core personal values. These exercises facilitate individuals in connecting with and reaffirming their values, ultimately enhancing their psychological well-being (Walton and Wilson, 2018). Field experiments revealed that African American students who engaged in value affirmations as in-class writing exercises at the start of seventh grade exhibited reduced accessibility of negative stereotypes and achieved higher course grades during that term, resulting in a 40% reduction in race differences (Cohen et al., 2006). Moreover, these improvements in grades persisted throughout eighth grade, with particularly notable benefits observed among initially low-performing African American students who may otherwise be susceptible to a cycle of threat and poor performance (Cohen et al., 2009). Hence, studies have demonstrated that wise interventions can yield enduring effects (e.g., Walton, 2011; Cohen, 2009). But how do these interventions achieve such long-term impact?

2.3 Can Wise Interventions Stimulate Long-Term Behavior Change?

By providing new meanings, wise interventions can stimulate "snowball effects" in people and in situations leading to a cycle of ongoing, recursive changes. This mechanism of lasting change is presented in Figure 1. To illustrate this mechanism, a notable example is the social-belonging intervention (Walton and Cohen, 2011), which targets the way students interpret academic

setbacks (i.e., left panel in Figure 1). This intervention seeks to alter students' perception of negative experiences, such as academic challenges, by reframing them in a more adaptive manner. Indeed, this intervention helps students realize that negative experiences, such as feeling lonely, are common and do not necessarily mean that they do not belong in college (i.e., middle panel in Figure 1). In the week after the intervention's delivery, minority students in the intervention condition no longer reported feelings of not belonging. This change in meaning making was accompanied by greater engagement in school (i.e., "Altered behavior" panel in Figure 1), such as studying more and e-mailing professors more. Consistent with the hypothesized self-enhancing cycle, the change in meaning statistically mediated the academic improvement over three years. At the end of college, minority students also showed evidence of sustained psychological change, namely greater confidence in their belonging in college in the intervention condition (i.e., right panel of Figure 1). Thus, brief interventions targeting how people make sense of themselves or a social situation can lead to long-term gains by altering people's behavior and the situations they enter, which then reinforce more adaptive meanings and support better trajectories.

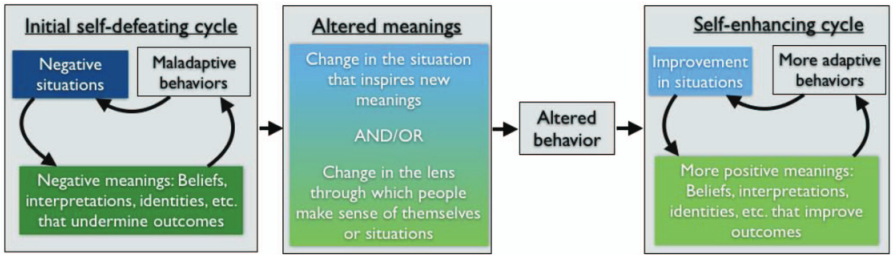


Figure 1: Mechanism of Recursive Change in Persons and Situations (Walton and Wilson, 2018).

Evidence suggests that interventions can improve recursive processes that unfold over time, and the gains can be sustained if the situation allows the initial change in meaning and behavior to become embedded in people's lives. For instance, an intervention designed to enhance social belonging among African American students during their transition to college increased their life and career satisfaction seven to nine years after treatment, mediated by stronger mentor relationships (Brady et al., 2020). Similarly, a social-belonging intervention tailored for middle school reduced disciplinary citations among African American boys from sixth grade through twelfth grade by 65%, nearly closing the disparity with White boys (Goyer et al., 2019). As another example, value-affirmation interventions, which aims to mitigate psychological stress by encouraging people to reflect on enduring positive aspects of themselves, have been found to break cycles of threat and under-performance among ethnic-minority students, leading to improvements in their academic trajectories (Cohen et al., 2009).

However, to ensure that wise interventions have a lasting impact, it is crucial to address one of the three fundamental motivations that shape individuals' self-perception, perception of others, and social environment: the desire to belong, to maintain a positive self-image, and to comprehend (Walton and Wilson, 2018). These three motivations are described hereafter.

The need to belong is a fundamental human motivation, driving people to seek connection, acceptance, and inclusion. When this need is threatened, individuals can experience distress. Wise interventions can help bolster a sense of belonging by changing people's meaning system, such as through social-belonging interventions. As discussed earlier, this type of intervention involves providing students with a narrative that frames social adversity in school as a shared and temporary experience, encouraging them to attribute adversity to common and transitional aspects of the college-adjustment process, rather than seeing it as fixed deficits unique to themselves or their ethnic group. This approach has shown significant impacts on minority students' GPA (Walton and Cohen, 2011).

The need for self-integrity is the desire people have to think positively about themselves, such as perceiving themselves as adequate, moral, competent, and coherent (e.g., Sherman and Cohen, 2006). When this sense of self-integrity is threatened, people may become defensive and experience poor functioning. Self-affirmation interventions aim to restore this sense of self-integrity by helping individuals focus on their core personal values. As mentioned earlier, Cohen et al. (2009) asked students to participate in structured writing assignments that prompted them to reflect on their important personal values. By reinforcing a sense of personal adequacy, this intervention was able to reduce the racial achievement gap over a period of two years.

The need to understand refers to people's motivation to develop reasonable understandings of themselves, other people, and the world around them, in order to comprehend and predict their own and others' behaviors. However, sometimes the information available leads people to draw negative conclusions. For instance, a student who believes that intelligence is a fixed quality and that he or she is "not good at math" will likely perform poorly (e.g., Mueller and Dweck, 1998). To combat this, certain wise interventions aim to promote a new way of interpreting one's experiences. These interventions are known as "*mindset interventions*" and will be discussed in further detail in the next section.

In conclusion, compelling evidence suggests that targeting individuals' self-perceptions or their interpretation of social situations through brief interventions can result in long-term benefits by modifying their behavior and the contexts they engage with. Such modifications reinforce more favorable meanings and foster more adaptive trajectories. Now that we have established the potential benefits of modifying individuals' self-perceptions and interpretation of social situations, we will delve into the mindset theory, which provides a framework for understanding how these modifications can be achieved. In the next section, we will provide an overview of the mindset theory, including its origins, key concepts, and empirical evidence supporting its validity.

3 Overview of the Mindset Theory

3.1 The History of the Mindset Theory

Mindsets, also known as *implicit theories* describe the beliefs people hold about the malleability of their intelligence (Dweck, 2007).

The development of implicit theories traces back to the 1970s, when two lines of research - learned helplessness and attribution theory - gained prominence (Dweck and Yeager, 2019). Learned helplessness, as demonstrated by Seligman and Maier (1967), showed that animals exposed to uncontrollable negative events learned to be passive even when the situation changed, suggesting that beliefs formed from experiences play a crucial role in motivation. Later, Weiner and Kukla (1970) extended this work to humans, emphasizing the importance of how people attribute their successes and failures, as explained by attribution theory.

Based on these findings, Dweck and her colleagues studied children's reactions to challenges and setbacks. They confirmed that children responded to failure in two distinct ways: some became helpless and blamed their poor abilities, while others remained mastery-oriented and looked for new strategies to overcome their failures (e.g., Dweck and Reppucci, 1973; Diener and Dweck, 1978). For instance, Diener and Dweck (1978) ran an experiment with late grade-school-age children worked on tasks: they succeeded on the first ones but failed on the next ones which were too difficult for children their age. Two distinct patterns of failure emerged. On the one hand, some of the children struggling with challenges spontaneously blamed their poor abilities, and reported they no longer believed they could solve one of the original problems again if they were readministered. These kids were named the "helpless children". On the other hand, some of the other children did not appear to see themselves as failing. Conversely, they tried to find new strategies to overcome the failures and they declared they were confident that they were would soon be successful again. Some of them even reported enjoyment for the challenge and the opportunity for mastery. Indeed, it appeared that these children perceived failure as an opportunity for new learning. These ones were named the "mastery-oriented children". The researchers observed that the maladaptive "helpless" response led to a deterioration of performance, whereas the more adaptative "mastery-oriented" response led to a better performance, even though IQs were controlled (Diener and Dweck, 1978). Why would students of roughly equal abilities show such different attributions and reactions?

This question was addressed a few years later. Elliott and Dweck (1988) developed the achievement goal theory. Indeed, students' goals shape the reactions facing setbacks. Elliott and Dweck identified two achievement goals: the performance goal (i.e., validating or proving one's worth) and the learning goal (i.e., developing one's abilities). But why would some students care more about proving their worth and other more about developing their abilities?

In the 1980s, researchers found an answer to this question. This was due to the conceptualization of "implicit theories" by Bandura and Dweck (1985), who discovered that people's beliefs about the nature of abilities orient them towards different goals and behaviors. They identified

two basic conceptions of intelligence: a fixed mindset and a growth mindset. Individuals with a fixed mindset view intelligence as a static trait that cannot be changed, while those with a growth mindset view intelligence as a malleable attribute that can be developed through effort and learning. As a result, individuals with a fixed mindset are more likely to be concerned with preserving their favorable judgments of competence, which leads them to avoid challenges and perform poorly. In contrast, individuals with a growth mindset see challenges as an opportunity to learn and develop their abilities, which motivates them to seek out challenges and perform better.

Hong et al. (1999) proposed to refer to this functioning system as "meaning systems", an organizing function bringing together goals, beliefs and behaviors. For instance, a person with a fixed mindset is more likely to pursue performance goals or to avoid challenges in order to validate one's abilities. This person is also more likely to believe that effort indicates low abilities, and setbacks confirm these low abilities. Therefore, this person is more likely to renounce in the face of challenges or setbacks. On the other hand, someone who endorses a growth mindset is more likely to wish to develop one's abilities by taking on learning goals and is more likely to see efforts as necessary and setbacks as being part of the learning process. Thus, this person is more likely to persist. But why do some people have a growth mindset while some other have a fixed one?

3.2 How is an Individual's Mindset Constructed?

In one study, Mueller and Dweck (1998) gave children a set of logic problems. After they completed the task, children were praised. Some of them received an intelligence praise which could induce a fixed mindset of intelligence (i.e., "That's a really high score. You must be very smart at these problems"). Some others received an effort praise which could induce a growth mindset of intelligence (i.e., "That's a really high score. You must have worked hard at these problems"). Finally, the others received a neutral praise (i.e., "That's a really high score"). Next, children received a new set of problems which was especially too difficult for children their age. Children with the neutral praise performed no better and no worse than they did before. But kids who received the effort praise did better than within the first set. Moreover, they were eager to take on more challenging problems in the future. Children who received the intelligence praise, at the contrary, sold fewer problems than during the first set and asked to do only easy problems in the future. Mueller and Dweck (1998) concluded to a causal relationship between praises and meaning systems, thus performance. Then, Kamins and Dweck (1999) studied the impacts on person praises and criticisms compared with process praise and criticisms with children of five and six years old. They found that a person feedback (i.e., "You're really good at this!") led to an increase in fixed theory concerning traits and thus greater helplessness facing setbacks than a process feedback (i.e., "You must have tried really hard!"). These results suggest that person feedback, even when they are positive, increase fixed mindset and vulnerability. Building on the findings from studies on praise and feedback, further research

has examined the role of parents, teachers, and classmates in shaping students' mindsets.

In 2016, Haimovitz and Dweck examined how parents may contribute to their children's mindsets. While they found no correlation between the parents' and the children's mindsets (Dweck and Yeager, 2019), their results showed that it is the way parents perceive and react to their children's setbacks that predicts their children's mindsets. In addition, Gutshall (2016) found that teachers also play a role in their students' mindsets. Indeed, it seems that the students' mindsets are directly linked to the students' perception of the teacher's mindset. In other world, students' perceptions of their teacher's beliefs accounted for and influenced their own mindset (more than whether or not they were able to accurately identify their teachers' mindset). This suggests that a key factor in students mindsets is not just what a teacher believes, but what each student perceives their teacher believes about their abilities and their individual potential for growth and improvement. In addition, mindsets of students are also influenced by the classmates' ones (King, 2020). Indeed, the classmates' mindsets predict the mindset one student can hold seven months later. Apart from parental and teacher influences, socioeconomic background also plays a significant role in shaping individuals' mindsets.

Indeed, socioeconomic background plays a role in mindsets individuals hold. Claro et al. (2016) showed that family income and growth mindset are two comparably strong predictors of academic achievement. But they also found that students from lower-income families are more likely to hold a fixed mindset than students from richer backgrounds (Claro et al., 2016). Moreover, it seems that having a growth mindset tempers the effects of poverty on academic achievement. Indeed, students in the lowest 10th percentile of family income who exhibited a growth mindset showed academic performance as high as that of fixed mindset students from the 80th income percentile.

The studies reviewed in the previous section shed light on how an individual's mindset is constructed and shaped by various factors such as feedback from parents, teachers, and peers, as well as socio-economic background. These findings raise the question of how these mindsets impact individuals' lives, which will be explored in the following section. Specifically, we will review evidence on the effects of fixed and growth mindsets on different aspects of individuals' behavior and outcomes.

3.3 How Do Mindsets Influence Behaviors?

Blackwell et al. (2007) set an experiment in a natural setting: a seventh-grade class at a public school located in New York City. Two conditions of interventions were randomly made. One of the conditions was the experimental one (i.e., a growth mindset training) and the other group was a control condition (i.e., an advisory class). Sixth-grade mathematics grades served as measures of prior student achievement: there was no difference between the two conditions based on their prior grades. The intervention was conducted for eight 25-minutes periods, one per week. Students in the experimental and control conditions both experienced structured workshops with instruction in the physiology of the brain, study skill and antistereotypic thinking. In addition,

students in the treatment condition learned intelligence is malleable and can be developed. The key message students learned was about the brain plasticity: the brain changes by forming new connections when a person works on challenging tasks. Students received vivid analogies and examples (e.g., brain becomes stronger as muscles). Students of the control condition learned about memory. Students in the control condition showed a decline in their mathematics grades throughout the year. This result was not found in the treatment condition: the group showed no decline in math performance after the intervention. The teacher also reported a higher motivation in their mathematics class in this group. This study supports the idea that having a "growth mindset" of intelligence is a key factor is student's achievement motivation, and it is possible to shock students' mindsets by implementing specific intervention. Interventions which aim at enhancing growth mindsets are referred as *mindset interventions*. Could the effectiveness and replicability of such interventions be confirmed?

Since then, many experiments have tested mindset interventions and their consequences, mostly in the educational domain. For instance, Paunesku et al. (2015) scaled up an online mindset intervention and found a positive impact on grades among lower-achieving students. This experiment has been replicated several times (e.g., Yeager et al., 2016, Broda et al., 2018), and in 2018, a meta-analysis showed an overall but weak impact of mindset intervention on academic achievement (Sisk et al., 2018). In 2022, a recent systematic review and meta-analysis of 113 growth mindset interventions in education and sports found that they improve academic achievement and task performance (Burnette et al., 2022). While some researchers have raised concerns about the potential for mindset interventions to inadvertently prime participants, there is currently limited empirical evidence to support this idea. For instance, a recent meta-analysis analyzing 273 studies indicated that the interventions produced significant improvements in academic achievement (Sisk et al., 2018). The authors also found that the effects of the interventions were not due to priming or demand characteristics, but rather reflected genuine changes in participants' mindsets and behaviors. These findings suggest that mindset interventions have the potential to be effective tools for promoting learning and development in various contexts. Furthermore, research on implicit and explicit attitudes suggests that priming effects tend to be short-lived and may not produce lasting changes in behavior or mindset (Fazio and Olson, 2003). In contrast, mindset interventions have been shown to produce long-term effects on individuals' mindsets and behaviors, indicating that they are not simply priming effects. Could mindset interventions have relevance beyond the educational context, considering their effectiveness in education?

In business organizations, mindsets also play a key role. Indeed, in a recent paper, Abernethy et al. (2021) examined the impacts of managers' fixed or growth mindsets. The results of this study highlighted that managers who endorsed a growth mindset showed better management practices (e.g., greater use of budget, engagement in fundraising activities, etc.) than managers who endorsed a fixed mindset. Moreover, the concept of growth mindset can apply not only to individuals, but also to organizations. Indeed, in 2019, Canning et al. described "organization's mindset", that is people's perceptions of the organization's belief about the fixed or developmen-

tal nature of talent and ability[1].They found that organizations perceived as endorsing a growth mindset were characterized by their employees as having higher levels of collaboration, innovation, and integrity. Employees also reported more trust and commitment. Why is a growth mindset more favorable than a fixed mindset, for both individuals (e.g., students, employees, etc.) and organizations?

One explanation would be a differential cognitive process for growth and fixed mindsets. For instance, Moser et al. (2011) found that, after a mistake, individuals who hold a growth mindset perform better than those with a fixed one. The researchers observed, among individuals with a growth mindset, an enhancement of the error positivity component (Pe) which would mediates the effect of the mindset on performance. The Pe is a wave occurring between 100 and 600 ms after an erroneous response that reflects the awareness of having made an error. Hence, after making a mistake, individuals with a growth mindset would increase their attention, thus improving their performance. These results were confirmed among young children (Schroder et al., 2017). Hence, mindsets play a key role in self-control mechanism.

Indeed, a meta-analysis by Burnette et al. (2013) highlights the crucial role of implicit theories of intelligence on self-regulatory processes, which, in turn, significantly predicts goal achievement. Having a growth mindset not only predicts goal setting, including both performance and learning goals, but also goal operating, such as helpless and mastery-oriented strategies, and goal monitoring, such as emotions and expectations. Moreover, a recent study explains why a growth mindset tempers the effect of poverty on academic achievement (Claro et al., 2016). Specifically, Fang et al. (2022) demonstrated that the relationship between socioeconomic status and learning engagement is moderated by a growth mindset. In other words, when compared to secondary vocational students with a fixed mindset, those with a growth mindset demonstrated higher learning engagement even when their socioeconomic status was low. These findings highlight the significant impact of having a growth mindset on self-regulatory processes and overall academic achievement. In addition, Myers et al. (2016) used functional magnetic resonance imaging (fMRI) to further examine the neural mechanisms linked to different mindsets. They found a neuroscientific interplay between growth mindset and intrinsic motivation. Therefore, individuals who endorse a growth mindset are more likely to engage in intrinsically motivated learning behaviors than people with a fixed mindset.

Having explored the mechanisms through which mindsets influence behaviors, the subsequent section will delve into other types of mindsets that exert a substantial impact on human cognition and behavior, beyond the realm of intelligence mindset.

3.4 Can There Be Other Mindsets Apart from Intelligence?

While mindset theories were originally dedicated to intelligence (Bandura and Dweck, 1985), implicit theories are broader than only the conception of intelligence: such theories are, more widely, the assumptions people make about the malleability of personal attributes (Dweck et al.,

[1]It is important to note that our focus is exclusively on the mindset of individuals in this thesis.

1995). People may view one's valuable attributes as a fixed characteristic (i.e., a fixed mindset) or as a malleable quality that can be developed (i.e., a growth mindset).

Implicit theories can vary by domain. For instance, an individual may hold a fixed mindset about one attribute while maintaining a growth mindset about another attribute, as noted by Lewis et al. (2021). Some of the mindsets already studied concern individuals characteristics (e.g., personality, Chiu et al., 1997b; creativity and wisdom, Sternberg, 1985; morality, Chiu et al., 1997a; self-regulation, Burnette et al., 2013; willpower, Job et al., 2015; health, Schreiber et al., 2020; and leadership, Hoyt et al., 2012), some other are related to interpersonal relationships (e.g., romantic relationships, Knee; 1998; and groups, Rydell et al., 2007), and some are about other characteristics (e.g., stress, Crum et al., 2013; planet, Duchi et al., 2022; criminality, Hoyt et al., 2022; strengths, Ding and Liu, 2022). For all of these implicit theories, whether individuals hold a fixed or a growth mindset influences their behaviors, and in most cases, researchers manage to manipulate these mindsets.

As an example of individual attribute's mindset, people behave differently if they think they can change their shyness (i.e., a growth mindset regarding shyness) or if they believe shyness is an immutable trait (i.e., a fixed mindset of shyness, Beer, 2002). In one study, individuals with a growth mindset of shyness avoided social interaction less, were more likely to consider social situations as a learning opportunity and had fewer consequences of their shyness (i.e., feelings of shyness and nervousness) than individuals with a fixed mindset of shyness. Another example is the emotional intelligence implicit theory: believing emotional intelligence can be developed (i.e., a growth mindset regarding emotional intelligence) leads to greater abilities in that specific domain than believing emotional intelligence is a trait of personality (i.e., a fixed mindset, Cabello and Fernández-Berrocal, 2015).

As an example of interpersonal relationships' mindsets, Rydell et al. (2007) showed that mindsets about groups predict group stereotyping. Indeed, while a fixed mindset regarding groups (i.e., group's characteristics are fixed) is linked to stereotypes toward these groups, it is not the case for a growth mindset regarding groups (i.e., group's characteristics are malleable). As another example, some individuals hold a growth mindset regarding relationships (i.e., relationships are successful by growing closer), while some have a fixed mindset of relationships (i.e., romantic destiny). Knee (1998) found that relationship survival was more strongly linked to initial satisfaction for those who have a fixed mindset. Indeed, when those who believed more strongly in destiny initially felt more satisfied, their relationships lasted particularly long, whereas when they initially felt less satisfied, their relationships ended quickly. In addition, when problems arise, individuals with a fixed mindset are more likely to view the problem as a sign that the relationship is not meant to be. Indeed, destiny belief is associated with disengaging from the relationship when there was a problem.

Finally, some other implicit theories have been unveiled by research. For instance, some individuals believe that stress is debilitating (i.e., stress is a health issue), whereas others believe stress is enhancing (i.e., stress is a way to make people stronger). Crum et al. (2013) demonstrated stress mindset determines the stress response. Indeed, individuals who endorsed

a stress-is-enhancing mindset reported improved psychological symptoms (i.e., cortisol reactivity) and better work performance, whereas their counterparts with a stress-is-debilitating mindset did not. As another example, a recent study showed two mindsets regarding climate change, that is the degree to which people perceive their world as a changeable entity that can be shaped (i.e., growth mindset) rather than a static one that cannot be changed (i.e., fixed mindset). Holding a growth mindset about the world was related to more accepting attitudes towards climate change, more favorable beliefs about its possible mitigation, and greater pro-environmental behavioral inclinations. In addition, ten days later, participants with a stronger view that the world is changeable reported having engaged more frequently in pro-environmental actions throughout those ten days.

Moving from the exploration of different mindsets related to various personal attributes, interpersonal relationships, and other characteristics, the next section provides an overview of the present thesis, which aims to investigate the role of implicit theories in shaping behaviors and outcomes when at work.

4 Overview of this Thesis

The mindset literature is flourishing and some questions are still unanswered. Although mindsets have been well-documented in the field of education (e.g., Sisk et al., 2018; Burnette et al., 2022), there has been a lack of research on their impact among adults in the workplace. The present thesis aims to contribute to this literature by examining the impact of mindsets on the way people behave when at work. The three chapters of this thesis are interconnected as they all explore the impact of mindset interventions in the workplace. Specifically, the first and third chapters focus on the effects of growth mindset interventions on employees' attitudes towards seeking feedback and demonstrating humility (Study 1), as well as on the willingness of job seekers to learn and adapt (Study 3). These chapters share a common interest in the benefits of promoting a growth mindset of intelligence in the world of work. Additionally, the first and second chapters are closely linked as they both investigate the implementation of mindset interventions in companies, marking the first time such interventions have been studied in this context. Together, these chapters contribute to a growing body of research on the potential benefits of mindset interventions for promoting growth mindsets in the workplace.

The links between the three chapters are represented in Figure 2.

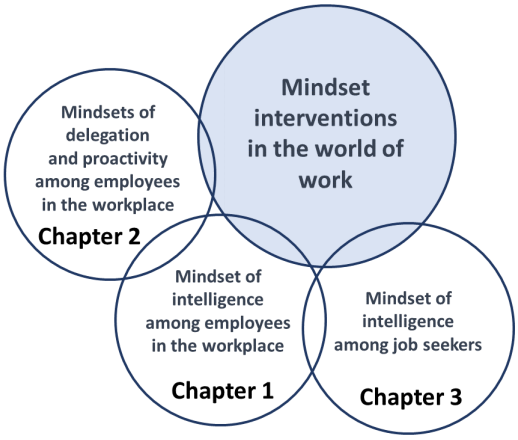


Figure 2: Graphic Representation of the Relationships Between the Three Chapters

Chapter 1: The Impact of a Growth Mindset on Feedback-Seeking Behaviors and Intellectual Humility

Receiving feedback is crucial for individuals to develop their competencies and abilities (Hattie and Timperley, 2007). Previous studies have explored the differences between a growth mindset (i.e., that is the belief that intelligence can be developed) and a fixed mindset (that is the belief that intelligence is fixed) in feedback processing (e.g., Moser et al., 2011, Zingoni and Byron, 2017, VandeWalle and Cummings, 1997). However, the existence of a relationship between a growth mindset and feedback-seeking behaviors has not been established yet (Cutumisu, 2019). Additionally, studies have shown that the display of intellectual humility (i.e., motivation for learning from others) by managers positively influences the feedback-seeking behaviors of their subordinates (Qian et al., 2018). However, the mediating effect of humility on the relationship between a growth mindset and feedback-seeking behaviors remains unexplored.

To address these gaps, two studies were designed. These field studies represent the first attempts to implement a growth mindset intervention among adult employees in a corporate setting. They aim to examine the causal effect of a growth mindset on feedback seeking (Study 1), as well as the potential mediating role of humility in this relationship (Study 2). Questionnaires measuring feedback-seeking behaviors and humility of the managers were administered to employees of a French bank in treatment and control groups before and after the intervention.

Results showed correlations between a growth mindset and feedback-seeking. In other words, the stronger an individual's growth mindset, the more likely he or she is to seek feedback and to perceive the feedback that he or she receives as useful and adequate. However, our results did not support our initial hypothesis that growth mindset interventions would lead to an increase in feedback-seeking behaviors and intellectual humility. Surprisingly, the scores of feedback seeking and intellectual humility decreased among those in the treatment condition, which is opposite to what we expected. DID analyses showed no impact of the intervention on these outcomes. Despite not finding the expected results, this study provides valuable insights into the potential

limitations of mindset interventions in changing behaviors related to feedback seeking and intellectual humility. Further investigation could focus on more objective measures of feedback and on the organizational context in which the intervention is implemented. Specifically, it would be valuable to assess the level of support or lack thereof for a growth mindset and individuals' initiatives within the organization.

Chapter 2: The Impact of Proactive and Delegation Mindsets in the Workplace: Experimental Evidence

Over the last few decades, research has increasingly highlighted the importance of proactivity (i.e., self-initiated, anticipatory action that aims to change and improve one's situation or oneself), for both companies (Parker and Collins, 2010) and employees (e.g., Fuller and Marler, 2009; Greguras and Diefendorff, 2010). To be proactive, employees need to be given the opportunity to take initiative and make decisions. Managers can facilitate this by delegating decision-making power to their subordinates (Al-Jammal et al., 2015). Previous research has shown that proactivity is related to a growth mindset (i.e., the belief that intelligence can be developed). However, little is known about the impact of proactive mindset (i.e., the belief regarding whether proactivity is an ability that can be developed) and delegation mindset (i.e., the belief regarding whether delegation is an ability that can be developed) on workplace behaviors.

To address this gap, we conducted a field experiment in which employees from a French organization participated in proactive and/or delegation mindset interventions. The purpose of this study was to examine the impact of individuals' beliefs about whether proactivity and delegation are innate characteristics or skills that can be developed through effort and practice (i.e., proactive and delegation mindsets) on their workplace behaviors. This experiment is the first of its kind to promote growth mindsets of proactivity and delegation through brief interventions among working adults in a business organization. The treatment and control groups completed questionnaires measuring mindsets, self-efficacy and attitudes towards delegation and proactivity, before and after the interventions.

Results showed that having a proactive growth mindset is positively associated with proactive self-efficacy and positive attitudes towards proactivity. This suggests that individuals who believe that proactivity can be developed are more likely to view proactive behaviors as beneficial and feel capable of being proactive. Second, we found that having a delegation growth mindset is correlated with delegation self-efficacy, reported delegation behavior, and positive attitudes towards delegation. This indicates that individuals who believe that delegation can be developed are more likely to feel capable of delegating, view delegation as positive, and actually delegate. Furthermore, our results revealed that having a proactive mindset partially mediates the positive relationship between perceived delegation and proactive self-efficacy. This suggests that having a proactive mindset can explain, at least in part, why perceiving that one's manager delegates tasks is associated with a greater sense of being able to be proactive. Lastly, we designed two mindset interventions aimed at fostering growth mindsets related to proactivity and delegation, but they did not result in significant changes in participants' growth mindsets,

proactive self-efficacy, delegation self-efficacy, or delegation behavior. Although the expected results were not found, this study offers valuable insights into the potential constraints of mindset interventions for altering behaviors. In future research, it would be valuable to investigate the supportive or unsupportive nature of the environment towards proactive and delegation mindsets, and also to explore whether the snowball effect of these mindsets has been prevented. Additionally, using more objective measures of delegation and proactivity in real-world settings would enhance the understanding of these constructs.

Chapter 3: The Impact of a Growth Mindset on Job Seekers' Willingness to Learn: Can Mindset Interventions Be Effective?

France has a high unemployment rate, with 2.3 million people currently out of work. Job seekers often face significant barriers to entering or re-entering the job market, including outdated skills and qualifications (Blumenberg, 2002). Therefore, training programs can be proposed to job seekers. However, a growth mindset of intelligence is associated with persistence in the face of difficulties. Among the proposed programs, are there any mindset interventions? Could mindset interventions be relevant for job seekers? This chapter consists of two parts. First, we conducted a literature review to examine existing training programs offered to the unemployed to promote their return to employment. Second, we tested a mindset intervention designed to promote growth mindsets of intelligence and interest, with the aim of encouraging job seekers to participate in training programs to improve their job prospects.

To assess the effectiveness of our intervention, we administered questionnaires to job seekers in treatment and control groups after a mindset intervention. We measured their growth mindset of intelligence, growth mindset of interest, and intention to register for training programs. This study represents one of the first attempts to examine the potential benefits of mindset interventions for job seekers. By promoting growth mindsets of intelligence and interest, we aim to increase job seekers' willingness to learn and engage in training programs, ultimately improving their job prospects. However, the inconclusive results of this study suggest that future research should conduct more controlled trials to test the effectiveness of the intervention design. However, if successful, interventions aimed at promoting growth mindsets could foster job seekers' beliefs in their ability to find employment and increase their willingness to attend training programs. This study's implications for reducing unemployment are significant, as it provides a potentially efficient tool for public policy makers. With a short duration of only 90 minutes and easy deployment through videos, the intervention has the potential to be a valuable resource for promoting job seekers' growth mindsets, encouraging their participation in training programs, and ultimately aiding in their reemployment.

Chapter 1: The Impact of a Growth Mindset on Feedback-Seeking Behaviors and Intellectual Humility

1 Introduction

1.1 Motivation

Receiving feedback is considered instrumental for students and working adults to develop their competences and abilities (Hattie and Timperley, 2007). Indeed, while competence is defined by the possession of the necessary knowledge and skills (i.e., learned expertise) required to effectively perform a task, abilities usually refer to a natural or innate capacity to perform a task. However, a vast amount of research has highlighted that individuals who believe that abilities can be grown and improved over time develop their abilities (Dweck, 2007); and that a growth mindset, that is the belief that intelligence is malleable, is an enabler of learning and development (Dweck and Leggett, 1988).

Moreover, studies have shown that feedback is processed and operated in different ways depending on the mindset of the individuals[2] receiving it (i.e., a growth mindset, that is the belief that intelligence can be grown; or a fixed mindset, that is the belief that intelligence is fixed; e.g., Moser et al., 2011, Zingoni and Byron, 2017, VandeWalle and Cummings, 1997). However, a recent study has not established the existence of a relationship between a growth mindset and feedback-seeking behaviors (Cutumisu, 2019). The aim of Study 1 is to test the existence of such a relationship and whether there is a causal effect of a growth mindset on feedback-seeking behaviors.

In addition, intellectual humility (i.e., the motivation for learning from others) displayed by managers is positively correlated with the feedback-seeking behaviors of their subordinates

[2]It is important to note that our focus is exclusively on the mindset of individuals in this paper.

(Qian et al., 2018). A growth mindset is an enabler of intellectual humility (Owens, 2009). However, the question of a mediating effect of humility on the relationship between a growth mindset and feedback-seeking behaviors has not yet been investigated. This is the aim of Study 2.

These field studies represents the first attempt to implement a mindset intervention among adult employees in a corporate setting. The studies aim to examine the causal effect of a growth mindset on feedback seeking, as well as the potential mediating role of humility in this relationship.

To test the relationships among a growth mindset, feedback-seeking behaviors and intellectual humility, we measured feedback-seeking behaviors (Study 1) and intellectual humility (Study 2) before and after treatment in both a control condition (i.e., business-as-usual control) and a treatment condition (i.e., mindset and feedback intervention). Participants' growth mindset was measured as well[3].

1.2 Background

Mindset theory (Dweck and Leggett, 1988) has attracted a great deal of attention in recent decades. This theory posits two types of mindsets (also known as implicit theories) of intelligence: the belief that intelligence is fixed (i.e., a fixed mindset) and the belief that intelligence is malleable (i.e., a growth mindset). The type of mindset individuals hold has a direct impact on how they approach learning and setbacks.

Thus, mindsets can determine how people learn and react to setbacks and advice in the workplace. Indeed, in 2017, Zingoni and Byron showed with two experiments that people who held a fixed mindset were more likely than others to consider feedback to be highly threatening to their self-concept. In turn, threats inhibited learning. In contrast, people who held a growth mindset were more likely to view feedback as highly valuable and relatively unthreatening, which was in turn associated with effort and learning.

These experiments were in line with the study conducted in neuroscience by Moser et al. (2011). They examined how people bounce back from mistakes based on their mindset through performance-monitoring event-related potentials (ERPs). They found that a growth mindset was associated with an increase in the error positivity component (Pe), which is associated with conscious attention allocation to mistakes. Thus, people who hold a growth mindset showed better adaptative responses to mistakes (i.e., accuracy) than people with a fixed mindset. Moreover, the Pe amplitude mediates the relationship between mindset and post-error performance.

While feedback is a valuable tool to improve one's skills and performance, some individuals avoid seeking it. This could be due to their orientation goal, which refers to the underlying motivation that drives one's behavior (Elliott and Dweck, 1988). According to VandeWalle and Cummings (1997), individuals with a learning orientation goal, which is associated with a growth mindset, are more likely to seek feedback. Conversely, individuals with a performance

[3]Their growth mindset was measured after treatment.

orientation goal, which is linked to a fixed mindset, are less likely to seek feedback. Therefore, it is plausible that there is a strong relationship between mindset and feedback-seeking behaviors. However, Cutumisu (2019), found no relationship between a growth mindset and such behaviors. Indeed, in her experiment, the researcher showed that a growth mindset does not drive learning choices, including feedback seeking. Thus, the relationship between mindset and feedback-seeking behaviors is still unclear, and the main aim of the Study 1 is to clarify this relationship.

In organizations, feedback-seeking behaviors may also be explained by management's intellectual humility. Humility "reflects a person's tendency to approach interpersonal interactions with a strong motive for learning through others" (p.1519) and impacts employee behaviors (Owens et al., 2013). To be more specific, Owens et al. (2013) defined three major components of humility: the manifested willingness to see the self accurately (i.e., a more objective appraisal of one's strengths and limitations), the appreciation of others' strengths and contributions (i.e., the acknowledgment of others' value), and the teachability (i.e., openness to learning, feedback, and news ideas from others).

Research has shown that a leader's humility is associated with her or his subordinates' performance (Owens et al., 2013). Additionally, leaders who display humility tend to create an environment that encourages their team members to seek feedback from them. Indeed, Qian et al. (2018) ran an experiment in a hotel in a large city in China with managers and their subordinates. It appeared that the leader's expressed humility was positively correlated with the feedback-seeking behaviors of the subordinates. In other words, subordinates who view their leader as humbler are more likely to seek feedback from her or him[4].

Researchers have described growth mindset (i.e., the belief that intelligence can be developed) as enabling humility (Owens, 2009). Moreover, Porter and Schumann (2018) showed that a growth mindset is an antecedent of intellectual humility. In fact, in their experiment, people who read an article about the evidence for a growth mindset of intelligence also showed higher humility and more respectful attributions for a disagreement right after this reading than those who read an article about the evidence for a fixed mindset. Therefore, the experiment provides evidence that highlighting different mindsets can shape participants' humility "at least temporarily" (p. 155). However, no research has determined a causal effect of mindset on humility in the medium term. The aim of the Study 2 is to test the impact of a mindset intervention on humility in the longer term and to test the mediation role of humility in the relationship between mindset and feedback seeking.

To test causal relationships between a growth mindset and feedback-seeking behaviors as

[4]The evidence on the type of people individuals seek feedback or advice from is mixed. One study by Price and Stone (2004) found that people preferred overconfident advisors over advisors with appropriate confidence levels. However, confidence is often used by individuals to infer ability, expertise, or task-related knowledge. In contrast, humility is used to infer the perceived cost of asking someone for feedback, as highlighted by a study by Qian et al. (2018).

well as intellectual humility, studies need to manipulate individuals' mindsets by fostering a stronger growth mindset.

For more than fifteen years, researchers have been developing and testing *mindset interventions*. These interventions induce a growth mindset by teaching that intellectual abilities are malleable and can be changed through hard work, effort, good strategies and help from others.

Because mindset interventions are mostly examined with students, many experiments have studied the impacts of mindset interventions on the educational domain and therefore on academic outcomes. According to a recent study (Combette et al., 2022), more than 75% of the students adopted more of a growth mindset after the interventions. This change in mindset was at least moderate (>40% change) for approximately 60% of the students who received the interventions.

Blackwell et al. (2007) evaluated an in-person growth mindset intervention delivered by trained facilitators. They found that it ceased the downward trajectory of math grades among 7th grade students who previously struggled in school. In another experiment, Paunesku et al. (2015) scaled up an intervention with an online format and, using a double-blind experimental design, found effects of the intervention on the grades of lower-achieving students months later. This last experiment has been replicated several times, and different positive effects on academic outcomes have been found (e.g., Yeager et al., 2016; Broda et al., 2018). In 2018, a meta-analysis showed an overall but weak impact of mindset intervention on academic achievement (Sisk et al., 2018). Indeed, only academically high-risk students and economically disadvantaged students significantly benefit from growth mindset interventions, with a standardized mean difference of d=0.19, 95% CI = [0.02, 0.36], p =.031 and no significant impacts for moderate-risk and low-risk students[5]. More recently, a paper which presents a systematic review and meta-analysis of 113 growth mindset interventions in various settings, such as education and sports reported additional insights (Burnette et al., 2022). The analysis found that growth mindset interventions are effective for improving outcomes such as academic achievement and task performance. However, the effectiveness of the interventions varied depending on factors such as the age of the participants (i.e., interventions tended to be more effective for younger populations) and the type of intervention (i.e., interventions that involved more active and hands-on learning tended to be more effective than those that were more passive, such as simply reading or listening to information). The authors suggest that growth mindset interventions are most effective for individuals who are low in growth mindset to begin with and that interventions that involve teaching individuals how to develop a growth mindset are more effective than interventions that simply convey the concept of growth mindset. Additionally, the authors note that interventions that are tailored to the specific context and needs of the individual or group may be more effective than standardized interventions.

Few studies have examined the effect of mindset interventions regarding intelligence in organizations with adult participants. Indeed, most experiments on mindset with adults study the

[5]Respectively d = 0.09, p =.162

entrepreneurial mindset, that is, the belief that one can become an entrepreneur (e.g., Alibhai et al., 2019, Pollack et al., 2012), or the leadership mindset, which is the belief that one can develop one's leadership (e.g., Hoyt et al., 2012). Thus, in his literature review, Holtey-Weber (2016) actually struggled to analyze mindset interventions in the business context. He found two papers, but one is only an evaluation of a mental health education program, and the second one is about the leadership mindset. Dupeyrat and Mariné (2005) studied the implicit theories (also known as mindsets) and orientation goals of adults who decided to return to school. However, no mindset intervention was tested in the paper. There may be several possible reasons why there have been relatively few growth mindset interventions tested with adult populations. One reason is that the concept of growth mindsets has historically been more associated with children and education, rather than with workplace or adult learning contexts. Additionally, there may be challenges in designing and implementing effective growth mindset interventions for adult populations, particularly in workplace settings where there may be competing demands on employees' time and attention. Finally, there may be a lack of awareness or understanding among adult learners about the potential benefits of adopting a growth mindset, which could limit their willingness to engage with such interventions.

As an exception, Heslin et al. (2005) studied self-persuasion training on the implicit theories of managers and the resulting impacts on their management behaviors. They found that a growth mindset was induced among employees through a ninety-minute workshop, and managers who were in the incremental induction condition evaluated significantly higher levels of good performance than those in the control condition. However, while the experiment examined working adults, the participants were also MBA students, and it is unclear whether the experiment took place in a lab or within the company. Therefore, a few questions remain unresolved: is it possible to induce stronger growth mindsets among employees within a specific company, and would such a change in mindset impact feedback-seeking behaviors?

1.3 Contribution and Aims of the Present Paper

These field studies represents the first attempt to implement a mindset intervention among adult employees in a corporate setting. The studies aim to examine the causal effect of a growth mindset on feedback seeking, as well as the potential mediating role of humility in this relationship. More specifically, this field experiments had two aims, and therefore, this paper presents two distinct studies:

Study 1 examines the causal relation between a growth mindset and feedback-seeking behaviors among subordinates. Study 2 examines the mediation role of humility expressed by managers in this relationship. The aims of this paper are represented in Figure 15.

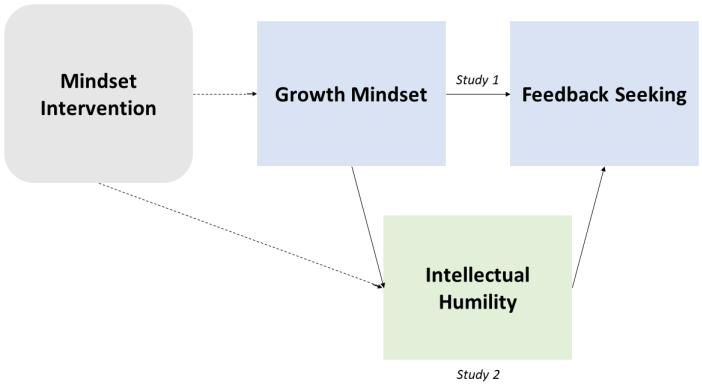


Figure 3: Visualizing the Examined Relationships in Study 1 (Blue) and Study 2 (Green)

1.4 Overview of the Present studies

General Method

Development of the Procedure

The two studies took place in a French bank. We choose to implement the experiments in this company because the director of the bank described the organization's culture as strongly hierarchical, and employees were not used to seek or give any feedback. Moreover, the direction was willing to develop a feedback culture in the bank. Indeed, in a bank setting, employees may give and receive feedback in various situations. For example, after working on a team project, employees may provide each other with feedback on the quality of the work produced. Or, after a customer interaction, employees may give each other feedback to help improve their skills for future interactions. As a last example, during a team meeting, employees may offer feedback to one another on their performance and contributions to the team.

The experiment was decided and developed with the bank's Deputy General Manager, the HR Manager and the Head of the Transformation department, along with their "internal customers", that are the Executive Vice Presidents respectively in charge of Retail Banking and "Finance and Operations".

When we initially met with these stakeholders in July 2021, their intention was not to conduct any experiments. They had contacted us for assistance in fostering a feedback culture within the bank. After introducing them to the concept of mindset theory, we proposed conducting an experiment to further our efforts. Then, it took a total of six meetings from July 2021 to September 2021 to get the whole group to agree on the experiment's conditions: number of participants, randomization method, content of the questionnaires, etc. A lot of constraints were due to our various stakeholders' concerns about the potential misunderstandings and objections that our experiment might raise among their employees, especially at management levels.

They were keen to avoid creating any kind of confusion with their existing initiatives that were currently being rolled out.

One particular concern was the randomization of samples, which some stakeholders were uncomfortable with, as they felt it might disadvantage some employees. To address this, we decided to deploy additional interventions for those employees who did not receive the initial interventions after the experiment had ended. This was done to ensure that all employees would benefit from the intervention, regardless of whether they were in the experimental or control group.

Participants and Design

We randomly selected managers[6] in each of two departments, that are finance and operations and retail banking to implement the two experimental conditions. We selected these two departments to reflect the main jobs of a bank (i.e., central services and network). 59 managers and their teams were assigned to the treatment condition (N=345) and participated in the interventions, and 57 managers and their teams were assigned to the control group (N=357) and did not participate in the interventions (business-as-usual control). In total, 701 employees were recruited for the present research. After excluding absentee workers in the treatment condition (due to sickness or work stoppage, N=48), the final sample comprised 653 employees, and neither the control group nor the treatment group knew they were taking part in an experiment.

All participants received an email in early October 2021 from their deputy director-general asking them to complete a survey. The survey was presented as a questionnaire to measure the interactions within teams in the company, and the answers were collected by an independent firm that guaranteed the respondents' anonymity. A link to the survey was attached in the email. People had ten days to respond. One week after the initial invitation email was sent, an independent company sent a reminder to the employees who had not yet completed the survey.

The interventions took place between mid-October and early December 2021. Then, the same questionnaire was sent again to all participants, and a third and final questionnaire was sent a few months later, in early March 2022, as a follow-up (cf. Figure 16).

Employees took part in a mindset intervention split in two parts. First, they participated in a general mindset intervention that aimed to induce stronger growth mindsets among participants. Then, they participated in a feedback training so that they can experience abilities regarding feedback-giving can be enhanced. This mindset intervention was implemented to test the causal relationship between mindset and feedback-seeking behaviors, and the potential mediation role of humility in this relationship. Thus, we measured the combined effects of the two parts of this intervention.

[6]NB: "Managers" refers to supervisors, "subordinates" stands for employees who are not managers and "employees" refers to all workers.

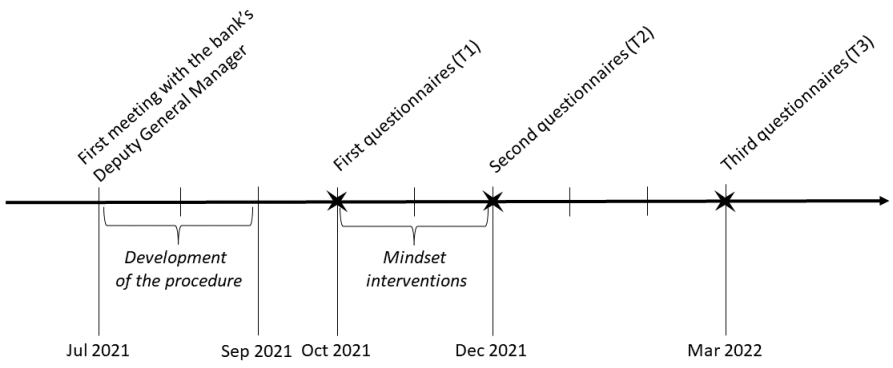


Figure 4: Timeline of the Present Studies

2 Study 1: Relationship between a Growth Mindset and Feedback-Seeking Behaviors

Feedback is an effective way to learn and improve performance in organizations. Moreover, a growth mindset (i.e., belief that abilities are malleable) enables learning and development. In addition, feedback is received differently based on the mindset of the individual receiving it. However, whether a relationship exists between mindset and feedback-seeking behaviors is still unclear. To test this relationship, we provided mindset interventions and brief feedback training to employees of a French bank and we measured feedback environment (i.e., the feedback one receives from one's manager and colleagues), feedback seeking (i.e., the feedback one asks), feedback practices (i.e., the number of feedback sought in the last four weeks) and growth mindset (i.e., the perception that one's abilities are malleable; see section 3.1.2. for details).

2.1 Specific Method of Study 1

Procedure

A total of 539 subordinates were randomly selected for this study. 288 subordinates were assigned to the control condition and 251 to the treatment one (to see the details related to participant selection, please refer to Section 2.1.).

In the treatment condition, all the employees took part in a growth mindset intervention split in to parts. The first one is called "Learning Power". The aim of this intervention was to foster a growth mindset in the participants, that is, the belief their abilities can be improved through

effort and work. Then, a few weeks later, all of the employees took part in the second part of the intervention, the feedback training about how to seek and give feedback. It was a continuation of the first part of the mindset intervention in that it aimed to foster the perception that feedback-seeking is an ability that can be developed. Each intervention group included approximately ten employees.

We created all the materials used during these interventions. Some of the videos are presented by actors (i.e., the thriller miniseries and videos that contain methods for asking and giving feedback), some are presented by workers from our company (e.g., popular science videos), and some are motion designed, that is voice over with animation of graphic elements. The precise protocols of this intervention is described in Supplementary Materials 5.

Each intervention lasted half a day and was delivered via videoconferencing by seven trainers from the bank. The facilitators were selected by the company from the "Transformation" department. Indeed, the members of this team have a cross-functional, non-hierarchical positioning in relation to the participants in the sessions, and the project related to the development of a feedback culture fell within the missions of this department. They were beforehand trained by the experiment in one day (i.e., first, they experimented the workshops as subordinates; and then, they trained they practiced leading each of the sequences, benefiting from the feedback of others). All the information, key messages and protocols delivered within the intervention were provided through videos and slideshow presentations. This delivery method ensured that the content of the interventions would not change between trainers and also allowed interventions to be delivered at a large scale. It is important to note that no trainer effect was found (see Supplementary Materials 5 for more details).

The Growth Mindset Intervention

According to a recent systematic literature review (Zhang, 2022), tested mindset interventions can have different designs: some take place on site, and some are fully online (and some are blended); some take place in a single session, and others have multiple sessions, but all sessions are relatively brief (from fifteen minutes to one hour per session). The key message of a mindset intervention is a metaphor: the brain is like a muscle and can grow and improve with effort (i.e., brain plasticity). As for message delivery, most experiments use text presentation and reading and testimonials. Then, most experiments use "saying is believing" exercises. According to "saying is believing" theory (Higgins and Rholes, 1978), the more people describe their position in their own words, the more likely they are to believe the message they receive. Finally, the internalized message may be persuasive but subtle. Thus, participants are rarely informed in detail about the intervention process or aim.

In the present study, employees were invited to participate in a two-hour online workshop called "Learning Power".

The intervention began with an introduction and a trust-building exercise, that is, a comfortable environment to participate was created. First, participants introduced themselves and answered an icebreaker question about something that others do not know about them. Then,

there were questions about what they liked best about their jobs and what made their jobs meaningful. Finally, the questions concluded with one about their job aspirations with an opportunity for self-reflection (Oyserman et al., 2004).

Then, they watched videos from a thriller miniseries. In this mindset intervention, clips from a miniseries and popular science videos were used for message delivery. Indeed, stories facilitate understanding of certain events and improve people's learning process (Rossiter, 2002). Moreover, it is easier to point out bad practices if people do not feel directly attacked. In the miniseries, one of the main characters said, "Whatever you do for a living, all of us have the power to develop and grow our own abilities". Then, participants were invited to watch a popular science video: "Do you know your potential?" The key message was about brain plasticity: when you learn something new, your brain gets bigger, more efficient and more powerful. Then, they were invited to briefly share what they found interesting in the video and participate in a "saying is believing" exercise. They were then asked to think about an activity that was initially difficult for them but in which they persevered and improved. They were invited to share their experience in pairs and to think about the aspiration they identified earlier and what they could do to achieve it.

Finally, they were asked about what they wanted to do in order to achieve their desire to learn. Then, a video of the WOOP method (Oettingen, 2012) to help people establish new behaviors was shown. WOOP (i.e., wish, outcome, obstacle, plan) is a scientifically rooted mental strategy that people can use to set their preferences and change their habits. This method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., "If..., then, I will..."). To conclude the intervention, participants briefly shared one idea they would take away from the workshop (see Supplementary Materials 5 for further information).

The Feedback Training

Employees were invited to participate in a workshop called "Moving forward together through feedback".

Participants were introduced to the concept of feedback through a short video and a brief definition (i.e., feedback is a "constructive comment addressed to the perpetrator of a job in order to help this person progress"). Then, they had three training sessions based on a fictitious case provided by the trainer (the case was the same for all groups). The first training was about giving feedback without using any particular tool, the second training began with a brief video titled "How to ask for feedback", and the last training began with a short video titled "How to give feedback". The participants were trained in groups of three: one asked for feedback, the second gave feedback, and the third observed the discussion and then gave feedback about it. Then, they switched roles. To conclude the intervention, participants briefly shared one idea they

would take away from the workshop (see Supplementary Materials 5 for further information).

Hypotheses and Dependent Measures

Study 1 examines the relation between a growth mindset and feedback-seeking behaviors among subordinates.
While Cutumisu (2019) found no association between a growth mindset and feedback seeking, Study 1 aims to clarify this relation:

H1a: Among subordinates, a growth mindset is positively correlated with feedback-seeking behaviors.

Then, this study is the first to investigate the causal link between a growth mindset and feedback seeking, making a novel contribution to the field:

H1b: The feedback-seeking behaviors among the treated subordinates will increase after a mindset intervention that aims to foster a stronger growth mindset.

Participants completed online questionnaires in early October 2021 (before treatment, referred to T1), in early December 2021 (after treatment, referred to T2) and in March 2022 (as a follow-up, referred to T3). The first and second questionnaires were designed to measure the employees' mindset and feedback behaviors. However, due to technical issues with the website used to administer the first questionnaires, the scale for measuring growth mindset did not appear. It is unclear whether the issue was caused by an excessive number of email addresses or an internet connectivity problem. Upon investigation, we discovered that the scale for measuring growth mindset was hidden from the first questionnaires. While we could have immediately sent a new link for the comprehensive questionnaires, we were concerned that this might cause confusion for the participants. Therefore, we decided to measure growth mindset in the second questionnaires only. This presents a problem for drawing conclusions in this study. Specifically, it prevents a manipulation check of the interventions' effects on individuals' mindsets. Therefore, if the feedback-seeking behaviors of the subordinates are not observed to increase after treatment, it may be because there is no relationship between mindset and feedback seeking or because the interventions did not increase the focal mindset. This issue will be discussed in the limitations section of the paper. Finally, in the third survey (follow-up), feedback-seeking practices were measured.

Responses were presented on a seven-point Likert scale (1 = "total disagreement", 7 = "total agreement") and the scales were averaged before analysis (see the Supplementary Material 3.5 for the full scales).

Because feedback behaviors are difficult to measure objectively in a field setting, we used three indicators: feedback environment, that is, the perception that one's environment provides useful feedback for doing one's work; feedback seeking, which is the behavior of asking for feed-

back to evaluate one's work; and the amount of feedback asked for (number of requests) or given (number of requests) in the last few weeks.

Feedback Environment

We used twelve items to measure the feedback environment (e.g., "My manager gives me useful comments about how I work"; "The comments my manager gives me help me do my work", α =.90). We translated to French and adapted the items from Steelman et al. (2004) by replacing "supervisor" with "manager" (i.e., more commonly used in business organizations) and by reducing the number of items. We retained six items from the subscale on the quality of feedback from the manager and colleagues, three from the subscale for feedback delivery, and three from the subscale for source availability. We dropped subscales linked to favorable and unfavorable feedback, promoting feedback seeking and source credibility to focus on the perception of feedback frequency and quality.

Feedback Seeking

We used three items to measure feedback seeking: "To better evaluate the quality of my work, I often ask my manager for his/her opinion"; "To better evaluate the quality of my work, I often ask my colleagues for their opinions"; "I often seek out comments in order to progress in my work" (α =.74). We translated to French and adapted the items from Krasman (2010) by transforming "to determine whether the results of your work are correct" by "to evaluate the quality of your work" and by using more general wording in questions about the way feedback is solicited. Indeed, the original scale had several ways to ask for feedback, and we used only "I often ask (...) for an opinion" in order to facilitate understanding.

Feedback Practices - Follow Up

Participants gave their answers on a scale from "0" to "3 or more". We used two items to measure the amount of feedback individuals sought: "How many times did you ask your manager for his/her opinion about your work in the last four weeks?" and "How many times did you ask your colleagues for their opinion about your work in the last four weeks?".
We also measured the amount of feedback given to colleagues and managers with two other items: "How many times did your manager ask for your opinion about his/her work in the last four weeks?", "How many times did your colleagues ask for your opinion about their work in the last four weeks?". We translated to French the items from VandeWalle and Cummings, 1997 and were added two by to for the analyses (i.e., one scale for the amount of feedback sought by the employee and one scale for the amount of feedback given by the employee).

Growth Mindset

We used three items to measure the malleability of abilities: "We can learn new things but we can't really change our capacities"; "Our abilities are something we can't really change"; "No matter what our capacity is at first, we can always improve through effort" (α =.73). We

adapted and translated the items to French following the strategy in Blackwell et al. (2007) by replacing "intelligence" with "capacities".

2.2 Results

To examine whether randomization was successful and groups were comparable, we checked the randomized assignment to each condition.

Both groups of subordinates were quite similar in terms of various attributes (see Table 17). Indeed, their response rates did not differ significantly within any of the three waves of the questionnaire. Moreover, the gender division did not differ (p=.3, chi-squared test). Regarding seniority within the company, both groups were quite similar (p=.4, t test). In addition, the responses regarding feedback seeking between the two groups did not differ significantly before treatment (p=.1, t test). However, the score of the feedback environment was marginally higher in the treatment condition before treatment than in the control condition (p=.08, t test), as was also the case for the perceived humility of their managers (p=0.55, t test).

In addition, one difference appeared concerning tenure in their current position. Indeed, subordinates in the treatment condition had held their job for significantly longer (p<.05, t test). As a manipulation check, we regressed job tenure on feedback seeking behaviors before treatment. Our analysis revealed a marginally significant effect of job tenure on feedback-seeking behaviors before treatment, with a regression coefficient of $\beta = -0.04$ (SD=0.02, p<.06). However, we found no significant effect of job tenure on the feedback environment before treatment ($\beta = -0.02$ (SD=0.02, p=0.2). These findings suggest that individuals with longer job tenure tend to seek feedback less frequently than those with shorter tenure, indicating the possible influence of job experience on feedback-seeking behaviors.

Therefore, the analyses are conditioned on these covariates, and these differences will be discussed in the limitations section.

Attrition

As seen in Table 17, in this study, the response rates decreased over time (see Supplementary Materials 5 for attrition reasons). Attrition must be examined to analyze whether subjects who are retained are comparable with those who are not. Therefore, we examined overall attrition (independent of condition) and differential attrition (dependent on condition) in both samples of subordinates. Regarding the *overall attrition*, subordinates retained in both samples are very similar to those not retained in terms of gender division and seniority within the company (both ps>.05, F tests) but differ in their job tenure. Indeed, subordinates who were not retained were likely to have had longer job tenures than those who were retained (3.50 years, SD=4.41 and 2.69 years, SD=3.36, respectively, t=-2.06, p<.05, F test). The characteristics measured before

Table 1: Descriptive summary of the subordinates by condition

	Control N=288	Treated N=251	p value
Response rate at T1 (in %)	53.9	55.2	0.753
Response rate at T2 (in %)	46.4	50.7	0.324
Response rate at T3 (in %)	32.6	37.5	0.236
Gender			0.352
Men	102 (38.3%)	78 (33.9%)	
Women	164 (61.7%)	152 (66.1%)	
Job tenure (in years)	2.89 (3.93)	3.64 (4.29)	0.045
Company seniority (in years)	16.4 (12.4)	17.2 (12.2)	0.494
Feedback environment at T1	5.16 (1.23)	5.39 (1.05)	0.086
Feedback seeking at T1	4.67 (1.45)	4.91 (1.43)	0.161
Perceived humility at T1	4.87 (1.57)	5.20 (1.29)	0.055

treatment (i.e., feedback seeking and environment, humility expressed by the managers) did not predict the overall attrition rate (all $ps>.05$, F tests).

We assessed differential attrition by testing interactions between attrition and condition assignment (see Supplementary Materials 5 for a description of the subsamples who were not retained). The only interaction that reaches significance is the one between gender and treatment ($z=2.43$, $p=.01$, F test). Indeed, women were retained at higher rates in the treatment condition than in the control condition, whereas men were retained at higher rates in the control condition than in the treatment condition[7]. None of the other individual characteristics (job and company seniority, perceived humility and feedback-seeking behaviors) predicted differential attrition.

Thus, job tenure is controlled for in the subordinate analyses.

[7]In the control condition, 60 men and 121 women were not retained, and 42 men and 43 women were retained. In the treatment condition, 56 men and 99 women were not retained, and 22 men and 53 women were retained.

Growth mindset and Feedback-Seeking Behaviors

First, we examined the relationship between a growth mindset and feedback-seeking behaviors. **Hypothesis:** *H1a: A growth mindset among employees is positively related to feedback-seeking behaviors.*

Results: A growth mindset is weakly correlated with feedback seeking and feedback environment. Therefore, *H1a* is partially confirmed.

Support for results:

To test this hypothesis, we explored the correlation between a growth mindset and feedback-seeking behaviors in the control condition (see Table 2).

	F-Env.	F-Seek.	F-Sou.	F-Giv.
Feedback environment				
Feedback seeking	0.67***			
Amount of feedback sought	0.34**	0.39**		
Amount of feedback given	0.18	0.13	0.36***	
Growth mindset	0.22*	0.24**	0.16	-0.02

*p<.001 =***, *p < .01 = **, *p<.05 =**

Table 2: Correlation Matrix of a Growth Mindset and Feedback-Seeking Behaviors among Subordinates

First, a growth mindset is positively correlated with feedback environment ($p<.05$, Pearson test). In other words, the more one perceives one's environment as providing one feedback, the more likely one is to hold a growth mindset. A growth mindset is also positively correlated with feedback seeking ($p<.01$, Pearson test). In other words, the higher the growth mindset one holds, the more one is likely to ask for feedback. This is in line with the hypothesis *H1a*.

However, the follow-up measures of feedback practices (i.e., the amount of feedback sought and given during the last four weeks) showed no correlation with mindset (both $ps>0.5$, Pearson tests).

In this section, we found positive correlations between a growth mindset and both feedback seeking and feedback environment in the control condition. However, the amount of feedback sought in the last few weeks is not correlated with a growth mindset; thus, *H1a* is only partially confirmed. Therefore, there is a link between the perception that your intelligence is malleable (i.e., a growth mindset) and whether you ask for comments (i.e., feedback seeking) and whether people around you give you comments about your work (i.e., a feedback environment). However, is this relationship causal? The next section tries to answer this question.

Impact of a Mindset Intervention on Mindsets

To test the causal relationship, we wanted to shock individuals' mindsets by fostering a stronger growth mindset. To do so, we designed and implemented brief interventions (i.e., a mindset intervention and feedback training).

Manipulation Check

As explained in the methodology section, we were not able to measure participants' growth mindsets before treatment. Therefore, we could not establish a causal impact of the interventions on the mindset of subordinates. However, we could compare the density distributions of participants' growth mindsets after treatment in each condition. Density distributions allow for a detailed analysis of the distribution of a given variable, and visually comparing the density distributions of two groups can highlight differences in the central tendency, spread, and shape of the distributions. This can help to identify any potential effects of the treatment on the outcome variable of interest.

To read a density distribution, it is important to first understand that it represents the probability density function of a variable, which describes the likelihood of the variable taking on different values. In a density distribution, the x-axis represents the range of values of the variable being analyzed (i.e., here, the growth mindset score), while the y-axis represents the probability density of the variable taking on each of those values. When comparing two density distributions, we should pay attention to the shape, location, and spread of the distributions.

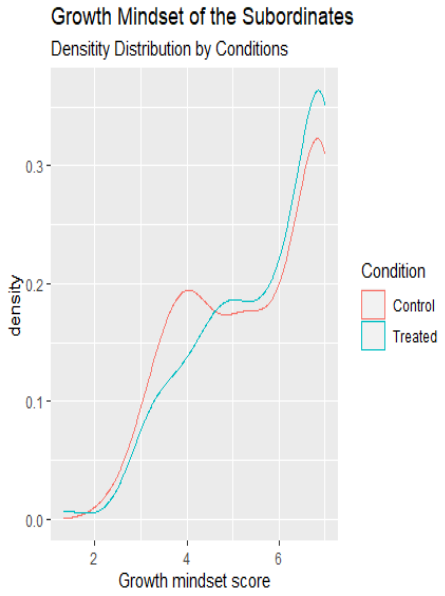


Figure 5: Growth Mindset of Subordinates: Density Distributions

Participants' growth mindset is measured on a continuum: the further left someone is, the

stronger the fixed mindset he or she holds; the further right one is, the stronger the growth mindset he or she holds.

As we can see in Figure 5, in the treatment condition, the curve is left skewed; the distribution seems the highest in the extreme right of the continuum, which represents a stronger growth mindset. At that point, the density is higher for the treated subordinates than for the control subordinates. Indeed, the distribution of the control group is also left skewed, but there is a small peak around the score of 4, and subordinates in this condition appear to have answered in a less extreme manner than subordinates in the treatment condition on the right side of the continuum. Comparing distributions, no significant difference appear (D=.09, p>.1, Kolmogorov-Smirnov test).

In conclusion, employees in the treatment condition seem to hold slightly stronger growth mindsets than employees in the control condition but this difference is not significant. The next section aims to compare the feedback-seeking behaviors across individuals who received the interventions and those who did not.

Impact of Mindset Intervention on Feedback-Seeking Behaviors

Therefore, we examined whether the relationship between a growth mindset and feedback-seeking behaviors is causal. To do so, we delivered brief interventions (i.e., mindset interventions and feedback training) that aimed to induce stronger growth mindsets to test their impacts on feedback seeking.

Hypothesis: *H1b: After a mindset intervention in a field setting, feedback-seeking behaviors among the treatment group will increase.*

Results: The scores of feedback seeking and feedback environment slightly decreased after treatment, but these results were not confirmed by difference-in-difference (DID) analyses. Therefore, *H1b* is not confirmed.

Support for results:

To test our hypothesis, we first looked at the descriptive results of feedback seeking and feedback environment before and after treatment. Results are presented in Table 3.

Feedback Environment

The mean scores of the feedback environment slightly decreased after the treatment for the control group. This difference looked more important within the treatment group, that is, the mean score after treatment seemed lower than the mean score before treatment.

To analyze these differences, we used the DID method. The goal of the DID estimator is to model the treatment effect by estimating the difference between outcomes measured at two time points for both the treated observations and the controls and then comparing the differences between the groups. DID requires that in the absence of treatment, the difference between

Feedback Environment Scores						
Condition	N	Mean Before	SD	N	Mean After	SD
Control	147	5.16	1.23	131	5.05	1.32
Treated	133	5.39	1.05	125	5.01	1.31
Feedback Seeking Scores						
Condition	N	Mean Before	SD	N	Mean After	SD
Control	154	4.67	1.45	133	4.60	1.37
Treated	138	4.91	1.43	125	4.54	1.41

Table 3: Feedback Environment Scores (at the top) and Feedback Seeking Scores (below) by Condition Before and After Treatment

the treatment and control groups is constant over time, but we only have one pretreatment measure, which prevents us from performing multiple analyses for parallel trends. However, no interventions (e.g., seminar, training) occurred in either condition during this time period (i.e., two months); thus, we can assume a parallel trend.

Thus, we ran a DID regression for the feedback environment while controlling for job tenure. It appeared that the intervention did not have a significant impact on the feedback environment (βdid=-.21, SD=.22, p=.34, F test).

Feedback Seeking

The mean scores are presented in Table 3. The scores of feedback seeking were similar before and after treatment for the control condition. Within the treatment condition, the mean score slightly decreased after treatment.

We also ran a DID regression for feedback seeking while controlling for job tenure. It appeared that the intervention did not have a significant impact on feedback seeking (βdid=-.25, SD=.25, p=.30, F test).

Feedback Practices: Follow-Up

Finally, as a follow-up three months later, we measured the amount of feedback within teams.

Condition	N	Amount of FB. sought	SD	Amount of FB. given	SD
Control	93	2.24	2.05	1.40	1.93
Treated	94	2.38	2.02	1.11	1.94

Table 4: Amount of feedback sought by the employees and given to colleagues or managers during the last four weeks.

Results are presented in Table 4. The amount of feedback sought by subordinates themselves during the last four weeks is very similar across conditions. The amount of feedback given by subordinates to their colleagues and management is also very similar between the control and

the treated conditions.When these differences were tested, it appeared that they were not significant (both ps>.05, t tests).

Because job tenure was different between the control and treatment conditions, we conducted analyses to examine the relationship between job tenure and feedback seeking, feedback environment, and feedback practices. Specifically, we aimed to investigate whether job tenure had an impact on these feedback-related variables and whether this impact varied depending on the experimental condition. Our analyses revealed that, after treatment, job tenure had a significant effect on feedback seeking (β = -.06, SD = .02, p <.05) and feedback environment (β = -.04, SD = .02, p <.05), but not on feedback practices (β = -.06, SD = .04, p = .1 for the number of feedback sought; β = -.02, SD = .03, p = .5 for the number of feedback given). We also tested whether the relationship between job tenure and feedback seeking and feedback environment differed depending on the experimental condition. We found no significant interaction between job tenure and condition for feedback seeking (β = -.01, SD = .04, p > .05) or feedback environment (β = .003, SD = .04, p > .05). These results indicate that people who have been in their job for a longer period of time tend to seek feedback less often and tend to view that environment as giving less qualitative and frequent feedback than those who are newer to the job. This suggests that job experience could be a factor influencing feedback-seeking behavior.

Although we hypothesized that the intervention would increase feedback-seeking behaviors among those in the treatment condition, both feedback seeking and feedback environment seemed to decrease after treatment. DID analyses showed no causal impact of the intervention on these outcomes. The follow-up administered several months after the intervention showed that subordinates in the treatment condition did not seek or give more feedback than subordinates in the control condition. Therefore, *H1b* is not confirmed.

2.3 Discussion

This study fills a gap in the literature by exploring the potential link between a growth mindset and feedback-seeking behaviors. Indeed, only a few papers have examined this relationship, which is not demonstrated yet (e.g., Cutumisu, 2019). What we found is that a growth mindset is correlated with declared feedback seeking and to the perception that one's environment provides one with useful feedback, but a growth mindset is not correlated with the amount of feedback sought three months after the intervention.

We sought to experimentally induce a growth mindset among those in the treatment condition to test the causal impact of mindset on feedback seeking. Due to unforeseen issues, we were not able to measure employees' mindsets before treatment, and therefore, we cannot conclude that the intervention successfully changed such mindsets. Although we expected the intervention to increase feedback-seeking behaviors, the scores of feedback seeking and feedback environment seemed to decrease in the treatment condition. DID analyses showed no impact of the intervention on these outcomes, even when focusing on subpopulations (e.g., men or women,

junior or senior employees). Moreover, the follow-up questionnaires administered three months after the treatment showed no difference between the control and treatment conditions in the amount of feedback sought or the amount given.

One possible explanation for the lack of difference in feedback behaviors at follow-up could be a "blown effect" of the intervention. While mindset interventions are intended to generate a "snowball effect" of positive outcomes, including improved abilities and a reinforced growth mindset, this requires ongoing effort and support for participants (Yeager and Walton, 2011). As Walton and Yeager (2020) notes, the effectiveness of "wise" interventions depends on the environment in which they are implemented, which should be supportive of effort and challenge-seeking. In the case of this study, it is possible that the employees did in fact gain a stronger growth mindset, but were unable to sustain this due to an unsupportive work culture, as described by the bank's Deputy General Manager. The organization's strongly hierarchical culture and lack of emphasis on feedback-seeking and growth mindset may have prevented the intervention's effects from lasting.

Another explanation could be the COVID-19 pandemic. Indeed, employees may be engaged in more teleworking than before due to the pandemic, which could prevent them from easily asking for or giving feedback in their day-to-day work.

3 Study 2: Relationships among a Growth Mindset, Intellectual Humility and Feedback Seeking

The intellectual humility of managers is correlated with the feedback seeking of their subordinates. In addition, a growth mindset may have a causal effect on humility, but this relationship has been tested only for very short periods of time. To test these relationships, we provided a mindset intervention split in two parts (i.e., general mindset interventions and feedback training) to employees of a French bank, and we measured expressed humility (i.e., self-assessed expressed humility of the managers), perceived humility (i.e., humility of the managers according to their subordinates) and growth mindset (i.e., the perception that one's abilities are malleable; see section 4.1.2 for details).

3.1 Specific Method of Study 2

Procedure

A total of 116 managers were randomly selected for this study. 57 managers were assigned to the control condition and 59 to the treatment one (to see the details related to participant selection, please refer to Section 2.1.).

The intervention protocol used in Study 2 was almost identical to that used in Study 1 (see Supplementary Materials 5 for further information). The interventions lasted one day and were delivered in a "classroom" by six professional trainers from the our firm. It is important to

note that no trainer effect was found for managers. The precise protocol of this interventions is described in Supplementary Materials 5.

Growth Mindset Intervention

The intervention was exactly the same as the subordinates' intervention (see Study 1). In addition, managers saw a second popular science video: "Can we promote the motivation to learn?". One key message of the video was that organizations have either a growth mindset or a fixed mindset: some companies believe that all employees are able to grow, whereas other companies believe that only a few employees (e.g., talents) are capable of growing. The humility of managers plays a role in the mindset of the organization and therefore of employees. Then, the participating managers were invited to briefly share what they found interesting in the video.

After that, managers were asked to identify a domain in which they wanted to increase their subordinates' desire to learn and then took part in a peer-coaching session. Finally, the video on the WOOP method (Oettingen, 2012) to help people establish new behaviors was shown. To conclude the intervention, participants briefly shared one idea they would take away from the workshop.

Feedback Training

This intervention was mostly the same as the subordinates' intervention (see Study 1). In addition, the participating managers watched a video called "Why we should focus on talents". The key message of the video was that the best-performing companies are those in which employees can do what they are best at every day. In other words, managers should encourage their subordinates to develop their main strengths and not only to correct what they do not do well. Then, the managers were invited to briefly share what they found interesting in the video. After that, they were asked to think about the precautions they would take in asking collaborators for sincere feedback and took a fourth training. Then, managers were asked to identify a difficult situation they faced with a collaborator and took part in a peer-coaching session. To conclude the intervention, participants briefly shared one idea they would take away from the workshop.

Hypotheses and Dependent Measures

Study 2 examines the causal effect of a growth mindset on humility in the medium term and the mediating role of humility in the relation between a growth mindset and feedback seeking of subordinates.

First, Study 2 aims to replicate the literature (e.g., Owens, 2009) by exploring the relationship between a growth mindset and humility:

H2a: A growth mindset is positively correlated with the humility expressed by managers.

Porter and Schumann (2018) demonstrated that a growth mindset intervention can temporarily prime humility (i.e., during a lab experiment). In contrast, Study 2 aims to investigate the long-term causal relationship between a growth mindset and humility:

H2b: A mindset intervention that aims to foster a stronger growth mindset will lead to an increase in the level of humility expressed by the treatment group.

The research of Qian et al. (2018) indicates that a manager's level of humility is linked to their subordinates' tendency to seek feedback. Building on this, Study 2 aims to explore the mediating effect of managers' humility on the relationship between a growth mindset and feedback seeking:

H3: The increase in feedback-seeking behaviors will be mediated by the humility expressed by managers.

We used data from Study 1 for the subordinates. Thus, only the data from the managers were new in Study 2. Managers completed online questionnaires in early October 2021 (before treatment, referred to as T1) and in early December 2021 (after treatment, referred to as T2). The first and second questionnaires were supposed to measure mindset and humility. Unfortunately, as was the case for Study 1, due to computer problems, the scale for measuring growth mindset was not sent to employees before the treatment was applied. Thus, this issue presents similar limitation on conclusions for this study. Specifically, it prevents a manipulation check of the interventions' effects on individuals' mindsets. Therefore, if the humility of the managers is not observed to increase after treatment, it may be because there is no relationship between mindset and humility or because the interventions did not increase the focal mindset.

Responses were given on a seven-point Likert scale (1 = "total disagreement", 7 = "total agreement"), and the scales were averaged before analysis (see the Supplementary Material 3.5 for full scales).

Expressed Humility

We used nine items to measure the self-assessed expressed humility of the managers [8] (e.g., "I admit when I don't know something"; "I ask for comments about how I work, even if they are sometimes negative", α =.81). We translated to French and adapted the items from Owens et al. (2013) by replacing "this person" with the first person singular.

Perceived Humility

We used nine items to measure the humility of the manager according to their subordinates

[8] It would have been preferable to also measure humility expressed by the subordinates, as this would give us more power to test the correlation between humility and a growth mindset. However, we replicate the literature by examining only managers' humility and its relationship with subordinates' feedback seeking (e.g., Qian et al. 2018).

(e.g., "My manager asks for comments about how he/she works, even if they are sometimes negative"; "My manager admits when he/she doesn't know how to do something", α =.93). We translated to French and adapted the items from Owens et al. (2013) by replacing "this person" with "my manager".

Growth Mindset

We used three items to measure the malleability of abilities: "We can learn new things but we can't really change our capacities"; "Our abilities are something we can't really change"; "No matter what our capacity is at first, we can always improve through effort" (α =.70). We translated to French and adapted following the strategy in Blackwell et al. (2007) by replacing "intelligence" with "capacities".

3.2 Results

Looking at the difference between the two groups of managers, it appears that they are very similar in terms of gender (p=.9, chi-squared test, see Table 18). Both groups are also very similar in terms of job tenure and company seniority (both ps>.05, t tests). Finally, the humility they expressed before the treatment was also similar (p=.2, t test).

However, whereas the response rates of the managers for the first questionnaire are similar between the two groups (p=.3, chi-squared test), for the second questionnaire, significantly fewer managers in the treatment condition responded (p=.04, chi-squared test), and the difference is marginal for the third questionnaire (p=.06, chi-squared test).

Given the small number of managers who were retained, the results must be interpreted cautiously. First, small sample sizes increase the number of type-II errors, while the study may not have enough statistical power to detect effects of a certain size. Then, we might wonder if managers who were retained were like those who were not. To investigate this point, attrition must be tested.

Attrition

As seen in Table 18, the response rates vary over time across each condition (see Supplementary Materials 5 for attrition reasons), and attrition must be analyzed.

Regarding the *overall attrition* of the managers, those who were retained were marginally more likely to be men (38 men and 21 women who were retained, 25 men and 27 women who were not retained,z=-1.72, p=.08, F test). None of the other characteristics predicted attrition among managers.

We assessed differential attrition by testing interactions with condition assignment (all ps>.05, F tests, see Supplementary Materials 5 for details). No interaction with any demographic or feedback behaviors reached significance.

Table 5: Descriptive summary of the managers by condition

	Control N=57	Treated N=59	p-value
Response rate at T1 (in %)	80.1	72.9	0.359
Response rate at T2 (in %)	70.5	53.2	0.046
Response rate at T3 (in %)	56.1	39.0	0.065
Gender :			0.955
Men	30 (55.6%)	33 (57.9%)	
Women	24 (44.4%)	24 (42.1%)	
Job Tenure	0.50 (1.11)	0.84 (1.42)	0.522
Company Seniority	20.1 (9.76)	20.3 (8.37)	0.951
Expressed Humility at T1	6.20 (0.69)	6.33 (0.45)	0.287

Therefore, gender is controlled for in the managers' analyses.

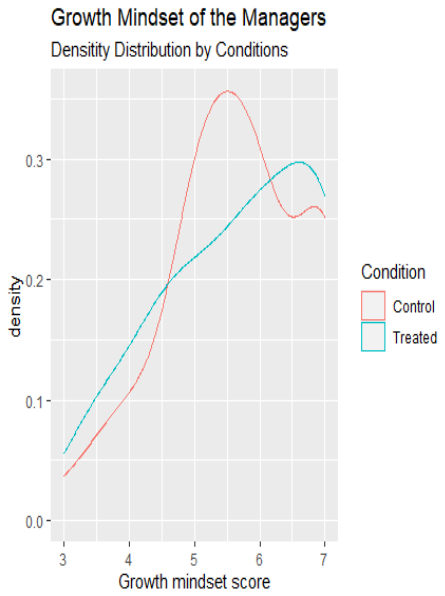


Figure 6: Growth Mindset of Managers by Condition: Density Distributions

Growth mindset is measured on a continuum: the further left someone is, the stronger the fixed mindset he or she holds; the further right someone is, the stronger the growth mindset he or she holds.

As we can see in Figure 6, among managers, the two distributions are both left skewed, but they are quite disparate. The density distribution of the managers in the control condition has

a large peak around the score 5.5, whereas the distribution of the treated managers presents its highest peak at the extreme score of 7. The comparison of distribution does not reach significant (D=.08, p>.1, Kolmogorov-Smirnov test).

In conclusion, we can say that managers in the treatment condition seem to hold slightly stronger growth mindsets than managers in the control condition but this difference is not significant. However, what about the relationship between a growth mindset and humility? The next section explores this issue.

Growth mindset and Expressed Humility

First, as a replication question, we examined the relationship between a growth mindset and intellectual humility.

Hypothesis: *H2a: A growth mindset is positively correlated with the humility expressed by managers.*

Results: Among managers, a growth mindset is positively correlated with expressed humility. Therefore, *H2a* is confirmed.

Support for results:

We tested the correlation between the expressed humility of the managers and their growth mindset. To observe the natural correlation, we selected managers from the control condition only (see Figure 7). This correlation is weak but significant (p<.05, Pearson test).

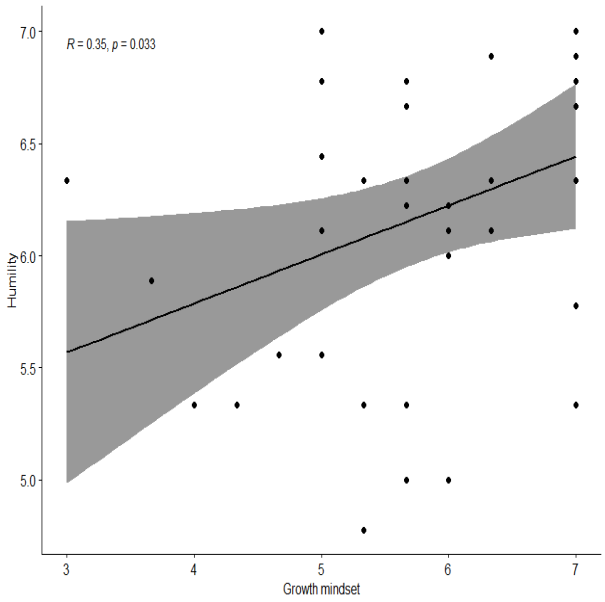


Figure 7: Correlation between a Growth Mindset and Humility among Managers

In other words, the stronger one's growth mindset, the more likely one is to express humility.

Thus, *H2a* is confirmed. However, we still ignore whether this relationship is causal and lasts for a long time, as these issues are the focus of the next section.

Impact of a Growth Mindset on Expressed Humility

Therefore, in this question, we test whether the relationship between a growth mindset and intellectual humility is causal and lasts for at least a couple of months. To do so, we provided brief interventions (i.e., a mindset intervention and feedback training) that aimed to induce stronger growth mindsets to test their impacts on intellectual humility.

Hypothesis: *H2b: After a mindset intervention, the humility expressed by the managers will increase.*

Results: After treatment, the self-assessed humility expressed by the managers and the humility perceived by the subordinates seemed to decrease, but these results were not confirmed by DID analyses. Therefore, *H2b* is not confirmed.

Support for results:

To measure the humility of the managers, we used two measures: the first is the self-assessed humility of the managers (also referred to as expressed humility), and the second is the humility of the managers according to their subordinates (also referred to as perceived humility). Results are presented in Table 6.

Expressed Humility Scores of the Managers						
Condition	N	Mean Before	SD	N	Mean After	SD
Control	45	6.20	0.69	38	6.17	0.65
Treated	43	6.33	0.45	30	6.07	0.50
Perceived Humility Scores of the Managers						
Condition	N	Mean Before	SD	N	Mean After	SD
Control	147	4.87	1.57	131	4.99	1.48
Treated	133	5.20	1.29	125	4.83	1.64

Table 6: Expressed and Perceived Humility of the Managers

Expressed Humility

Whereas the expressed humility appears to be constant for those in the control condition, the score appears to slightly decrease after treatment for those in the treatment condition.

We ran a DID regression for the managers' expressed humility. It appeared that the intervention did not have a significant impact on expressed humility (βdid=-.22, SD=.19, p=.2, F test). However, it is possible that managers are not aware of changes in their humility, and thus, asking their subordinates to measure it is relevant.

Perceived Humility

Regarding the humility perceived by the subordinates, the mean score seemed slightly higher after treatment than before for the control condition. In contrast, within the treatment condition, the mean scores looked lower after the treatment than before .

We ran a DID regression for perceived humility while controlling the job tenure of the subordinates. The results show that the intervention had no significant impact on perceived humility (βdid=-.42, SD=.27, p=.12, F test).

Although we hypothesized that the intervention would increase the humility of the managers, both managers and subordinates in the treatment condition had lower humility scores after the treatment. However, the DID analyses showed no overall impact of the intervention on the expressed and perceived humility of the managers. Therefore, *H2b* is not confirmed and *H3* is not tested.

3.3 Discussion

The present experiment replicates work in the existing literature (e.g., Porter and Schumann, 2018) by pointing out the positive correlation between a growth mindset and intellectual humility.

Moreover, this study examined the causal effect of a growth mindset on humility in the medium term and the mediating role of humility in the relation between a growth mindset and feedback seeking. On the one hand, the scores of humility unexpectedly decreased after treatment, and DID analyses revealed no impact of the intervention on these outcomes. Study 1 revealed no impact of the growth mindset intervention on feedback-seeking behaviors, even when focusing on subpopulations (e.g., men or women, junior or senior employees, etc.), so the mediation hypothesis could not be tested.

One possible explanation of the decrease in humility (even if not significant) could be the change in reference point. Indeed, the expectations of employees could have changed after treatment. For instance, subordinates may have become more critical of their managers, and managers may have become more critical of themselves. In a recent paper that studied the impact of a wise intervention in French middle schools, Huillery et al. (2021) found that the program worsened some aspects of self-reported diligence (i.e., grit, work discipline and homework management) for most students. However, both teachers and school registers provided evidence that the students' behaviors actually improved. The authors concluded that this result indicates that the "program changed the reference point against which students compare[d] their own character" (p.4).

4 General Discussion

The aims of this paper were to examine the relationship between a growth mindset and feedback-seeking behaviors and to explore the causal effect of a growth mindset on intellectual humility in the medium term and how humility expressed by management mediates the relation between a growth mindset and the feedback-seeking behaviors of subordinates. To do so, we implemented a two-part mindset interventions (i.e., general mindset intervention and brief feedback training) with working adults. We hypothesized that the induction of a stronger growth mindset would lead to more feedback-seeking behaviors and more intellectual humility.

In Study 1, we showed the correlations between a growth mindset and both feedback seeking and feedback environment. In other words, the stronger an individual's growth mindset, the more likely he or she is to seek feedback and to perceive the feedback that he or she receives as useful and adequate. We aimed to experimentally induce a growth mindset among those in the treatment condition to test the causal impact of a growth mindset on feedback seeking. For unforeseen reasons, we were not able to measure employees' mindsets before treatment, and therefore, we cannot conclude that the intervention successfully changed such mindsets. Thus, while we expected the intervention to increase feedback-seeking behaviors, we observed no impact. In contrast, the scores of feedback seeking and feedback environment appeared to decrease among those in the treatment condition. DID analyses showed no impact of the intervention on these outcomes. Moreover, the follow-up questionnaires administered three months after the treatment showed no difference in the amount of feedback sought and given between those in the control and the treatment conditions.

In Study 2, we replicated the literature, showing the correlation between a growth mindset and intellectual humility. We aimed to experimentally induce a growth mindset among those in the treatment condition in order to test the causal impact of mindset on intellectual humility in the medium term (i.e., two months). However, as was the case for Study 1, we could not conclude that the intervention successfully changed mindsets. However, we expected the intervention to increase the humility expressed by the managers, and both managers and subordinates rated managers' humility lower after treatment than before. DID analyses showed no impact of the intervention on humility. Therefore, we could not test the mediation model as expected.

This field experiment had several limitations. First, the lack of measurements for growth mindsets before treatment prevented us from examining the efficacy of the tested intervention on enhancing a growth mindset. Thus, we could compare only the mindsets between conditions after treatment, and the distribution of growth mindsets were alike in the treatment condition than in the control condition. However, we cannot confirm whether that the two conditions' mindsets were comparable before treatment. For instance, feedback environment and perceived humility scores before treatment marginally differed between conditions.

Other limitations are the low response rate and the high attrition rate. Indeed, approximately 54% of subordinates responded to the first questionnaire, and this rate decreased across each successive questionnaire. However, it is interesting to note that the director of the firm indicated

to us that these response rates are typical for the firm. The same phenomena appeared among managers, but managers in the treatment condition were less likely to respond than managers in the control condition. This may be because the managers felt that they had already spent too much time on the interventions (i.e., two days) and did not want to "waste" any more time on them. Because of the high attrition rate, the results must be interpreted with caution, and future studies could test this design with a larger sample size. Nevertheless, attrition analyses indicated that individuals who were retained between the first and second questionnaires were very similar, except in terms of job tenure and gender.

As another limitation, it would have relevant to have two additional treatment conditions in order to study the impacts of a mindset intervention without a feedback training and a feedback training without a mindset intervention. However, it is important to acknowledge that conducting multiple experimental conditions can pose significant challenges for business organizations. In addition to time and resource constraints, it may be ineffective to only have a partial training condition for participants. Nonetheless, it is noteworthy that the feedback training was integrated into the mindset intervention and participants underwent three training sessions where they learned new methodologies. Each session included debriefing, which helped participants realize their progress in improving their feedback behaviors.

Moreover, the randomization was not an absolute success. Indeed, those in the two conditions present several differences before treatment in terms of job tenure, feedback environment and perceived humility. Concerning feedback environment and perceived humility, the DID analyses control the former differences by looking at the evolution in both conditions. In addition, we analyzed the effects of job tenure on feedback seeking behaviors. The findings suggest that feedback seeking is less common among individuals with longer job tenure, potentially because job experience shapes how people approach seeking feedback. However, subordinates in the treatment condition had held their job for longer than subordinates in the control condition. Thus, we tried to minimize this difference by controlling for job tenure in the DID analyses.

The lack of a placebo intervention could be seen as a limitation because of the Hawthorn effect. Indeed, focusing on only some individuals may influence their behaviors. Therefore, it is generally agreed that two interventions are necessary to prevent this bias: a treatment and an active control intervention. However, given that employees are actively working and often participate in various workshops and training, a business-as-usual control could be sufficient.

As an additional limitation, we lacked some information to make supplementary analyses. First, the company did not allow us to match managers and their teams to realize dyad analyses. Indeed, the direction of the bank feared that the union organizations would considered it as a hidden evaluation of managers by their team. Hence, we were not able to examine effects at team levels. Moreover, we have no information about the trainers from the bank, except for their gender (i.e., five women and two men). Maybe participants could have presented more reactance to a junior trainer than to a senior one. However, this limitation can be nuanced by the fact that no trainer effect was found. Moreover, regarding the measurement, it would have been relevant to measure feedback behaviors in a objective manner. However, there is no tool

to measure feedback in a field setting because feedback are mostly informal discussions. Hence, we used three declarative indicators of feedback behaviors (i.e., feedback environment, feedback seeking and the amount of feedback asked and given in the last few weeks).

Finally, we translated in French and adapted all the scales we used in the studies. If we had more time to implement this field experiment, we would have done a psychometric validation of each scale to ensure their validity. However, it should be noted that all the Cronbach's alphas are larger than .70. This suggests suitable internal consistencies.

Future work could include more objective measures of feedback. Doing so could enable researchers to examine whether the decrease in feedback seeking and humility does indeed come from a change in reference point.

Even more importantly, future work could investigate the organizational context in which mindset interventions are implemented by examining the extent to which the environment is conducive or inhibitive to growth mindset and effort. Using the metaphor of soil and seeds from Walton and Yeager (2020), this entails examining the degree to which the organization provides fertile ground for the seeds of a growth mindset intervention to take root and thrive. Understanding the context in which mindset interventions are effective or ineffective can inform the design and implementation of interventions that are better suited to the specific needs of different organizations. For instance, one suggestion could be to conduct a pre-intervention assessment of the organizational culture and climate related to growth mindset and effort. This could involve administering surveys with employees to gather data on their attitudes, beliefs, and behaviors related to these concepts. By collecting this data before the mindset intervention is implemented, researchers can establish a baseline understanding of the current state of the organization and identify areas for improvement. This baseline data can also serve as a reference point for evaluating the effectiveness of the mindset intervention. By comparing post-intervention data to the baseline data, researchers can determine whether the intervention had a significant impact on the organization's culture and climate. This information can be used to refine future interventions and tailor them to the specific needs of the organization.

Finally, it would be interesting to test the materials used in this experiment in a more controlled trial. Indeed, our intervention materials slightly differ from those generally used in mindset interventions. Specifically, our intervention is longer than those typically studied, with a day for managers and half a day for subordinates, compared to the usual one-hour duration in several studies. Additionally, our intervention targets an older population that is often understudied with mindset interventions, while a recent systematic review by Burnette et al. (2022) found that these interventions are generally more effective with younger populations. Our study also differs regarding the activities proposed. For instance, most experiments make people write a great deal, whereas we asked participants to talk in pairs to internalize certain ideas. Moreover, to make our experiment appropriate for a business context, we encapsulated the mindset intervention in a pleasant experience for participants, although this risked losing the key messages.

5 Supplementary Materials

Measures

Scales for Study 1

- Feedback environment (adapted from Steelman et al. (2004), α=.90):
  - Mon/ma manager me fait des commentaires utiles concernant la façon dont je travaille.
  - Les commentaires que je reçois de la part de mon/ma manager m'aident à faire mon travail.
  - J'accorde une grande valeur aux commentaires de mon/ma manager sur mon travail.
  - Mon/ma manager commente mon travail de manière mûrement réfléchie.
  - Mon/ma manager traite les gens avec égards lorsqu'il/elle commente leur travail.
  - Quand mon/ma manager commente mon au travail, il/elle fait attention à ne pas me blesser.
  - Mon/ma manager est suffisamment disponible pour commenter mon travail.
  - J'ai beaucoup de contacts avec mon/ma manager.
  - Le seul moment où mon/ma manager commente mon travail, c'est lors de l'entretien annuel.
  - Les commentaires que je reçois de la part de mes collègues m'aident à faire mon travail.
  - J'attache de l'importance aux commentaires de mes collègues sur mon travail.
  - Mes collègues me font des commentaires utiles concernant mon travail.
- Feedback seeking (adapted from Krasman (2010), α=.74):
  - Pour mieux évaluer la qualité de mon travail, je demande souvent son avis à mon/ma manager.
  - Pour mieux évaluer la qualité de mon travail, je demande souvent leurs avis à des collègues.
  - Je cherche souvent à obtenir des commentaires pour progresser dans mon travail.
- Growth mindset (adapted from Blackwell et al. (2007), α=.73):
  - On peut acquérir des connaissances, mais on ne peut pas vraiment changer ses capacités.
  - Nos capacités sont quelque chose, en nous, qu'on ne peut pas vraiment changer.

- Quel que soit son niveau de compétence au départ, on peut toujours progresser avec de l'effort.

Scales for Study 2

- Humility of the manager perceived by subordinates (adapted from adapted from Owens et al. (2013), α=.93):
  - Mon/ma manager demande des commentaires sur sa propre façon de travailler, même s'ils sont parfois négatifs.
  - Mon/ma manager admet quand il/elle ne sait pas faire quelque chose.
  - Mon/ma manager sait reconnaître lorsque d'autres personnes ont plus de compétences que lui/elle sur un sujet
  - Mon/ma manager repère les points forts des gens.
  - Mon/ma manager exprime de la reconnaissance pour les contributions particulières que chacun apporte.
  - Mon/ma manager complimente souvent les gens sur leurs points forts.
  - Mon/ma manager est disposé(e) à apprendre des autres.
  - Mon/ma manager est ouvert(e) aux idées des autres.
  - Mon/ma manager accepte facilement de recevoir des conseils.

- Expressed humility (adapted from Owens et al. (2013), α=.81):
  - J'admets quand je ne sais pas faire quelque chose.
  - Je sais reconnaître lorsque d'autres personnes ont plus de compétences que moi sur un sujet.
  - Je demande des commentaires sur ma propre façon de travailler, même s'ils sont parfois négatifs.
  - Je repère les points forts des gens.
  - J'exprime de la reconnaissance pour les contributions particulières que chaque collaborateur apporte.
  - Je complimente souvent les gens sur leurs points forts.
  - Je suis disposé(e) à apprendre des autres.
  - Je suis ouvert(e) aux idées des autres.
  - J'accepte facilement de recevoir des conseils

- Growth mindset (adapted from Blackwell et al. (2007) α=.70):

– On peut acquérir des connaissances, mais on ne peut pas vraiment changer ses capacités.
– Nos capacités sont quelque chose, en nous, qu'on ne peut pas vraiment changer.
– Quel que soit son niveau de compétence au départ, on peut toujours progresser avec de l'effort.

Details Intervention Protocols

Subordinates' Intervention Protocol	
PART 1: GROWTH MINDSET INTERVENTION	
Sequences	**Activities**
Introduction and trust-building exercises	Introduction of the participants: "My name is ... and a few people here knows about me that..."
Creating an expectation : Why do I want to progress?	"In your professional life, how many jobs have you had had?". "For instance, I have been..." "One aspect you particularly appreciate in your current job is..." "Some of the things you love most about my job are..." Self-reflection video: "Meaningful moments at work" (2'20). Based on the work of King (2001), this motion design video invites participants to think about a meaningful moment they experienced recently at work. This could be a moment where they felt particularly useful, connected to others, or proud of accomplishing something difficult and to remember and relive this specific moment. Finally, participants think of what they would like to do in order to experience more meaningful moments like that one. "We all experience moments that might seem trivial but which, with hindsight, contribute to the meaning of our work. In pairs, each one of you can look back on one of these moments." Self-reflection video: "Reflect on your aspirations" (3'05). Based on the work of King (2001), this motion design video invites participants to project themselves into the future and to imagine the best version of themselves, and then, the worst. "In your case, being able to become the "best version of you" one day, professionally, seems to you..." "To get closer to the "best version of me", I could, for example, try to get even better at ..."

Diving into a story to ease the message delivery	Introduction of the thriller miniseries called “Call For Action” and presentation of its teaser (1’10). Written, produced and directed with an international team, Call For Action is a Netflix-standard thriller series created by Korda & Company. The concept: Dorian Bonham is in charge of the secret operations of a defense agency affiliated with the UN. In the event of a mission failure, he has access to technology that sends him back in time and offers him a second chance to change the course of history. Introduction of the main characters and gamification of the workshop: “Congratulations! After a lot of hard work, you have just been admitted into the mysterious Agency. There is one last step to become a real secret agent: you have to find a pseudonym composed of an animal name and an adjective!” The numbers game: “Upon arrival, you will be given your access code to the Agency's encrypted messaging system. For security reasons, this code cannot be entered anywhere. Be prepared to memorize the numbers.” “How many numbers do you think you can memorize in order?” Numbers appeared and disappeared on the screen, and individuals were instructed to try to remember the highest number of digits. “How many numbers do you think you could remember in order with practice?” Call For Action, episodes 1 (4’26), 2 (6’01) and 3 (3’45). After each episode, a quick debriefing through a game: participants are split in two teams and they confront each other in a ping-pong of ideas (i.e., “The worst advice we could give Dorian...” and “Very concretely, Dorian should not have...”).
Encouraging a growth mindset	In the miniseries, one of the main characters said, ``Whatever you do for a living, all of us have the power to develop and grow our own abilities".  Presentation of a popular science video: ``Do you know your potential?" (7’16). Facing the camera, an expert (i.e., the president of the experimenter’s company) explains the principles of brain plasticity: when you learn something new, your brain gets bigger, more efficient and more powerful. Participants briefly share what they found interesting in the video. “Saying is believing” exercise: participants share their experience about an activity that was initially difficult for them but in which they persevered and improved in pairs. “One important thing I take away from this exchange is...”.
Taking action	“To get closer to the "best version of you in the future" at work, what you already do best on a daily basis is...” “Lately, one little thing that has helped me progress is for example...” “To get closer to the "best version of you in the future" at work, you would like to be even more...” “What will you do with all this? During this workshop, you were able to step back and reflect on your work and some of your aspirations. Perhaps this workshop has further strengthened your desire to learn? The method you are about to discover can help you take action.” Presentation of the WOOP motion design video (3’) to help people establish new behaviors. This method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., ``If..., then, I will...").
Conclusion	Finishing the story: “What you want Celeste to do first is to bring Dorian to...” Call For Action fourth and final episode (5’10). Round table: “One important idea I leave with is...”

Subordinates' Intervention Protocol

PART 2: FEEDBACK TRAINING

Sequences	Activities
Introduction and trust-building exercises	Introduction of the participants: "My name is ... Among the things I love about my job, there is..."
Defining a feedback	"A feedback is a constructive comment addressed to the author of a work to help him/her to progress." Presentation of a video about the Beatles (1'44): two speakers (i.e., from the experimenter's company) are facing the camera and have a conversation about Ringo Starr who improved with feedback from the other band members. First training session based on a fictitious case. Debriefing: "As Alex, the hardest part about getting feedback from Sam is..." "And so, for Alex, it is especially difficult..." "As Sam, the hardest part about giving Alex feedback is..."
Asking for feedback	"In your case, receiving more feedback would be especially useful for..." Presentation of a brief video (2') : "Receiving feedback". Facing the camera, one actress explains that, to receive a feedback, one should ask for one, rephrase it, ask for clarification and advice and take action. Second training session based on the same fictitious case in groups of three: one asked for feedback, the second gave feedback, and the third observed the discussion and then gave feedback about it. Then, they switched roles. Debriefing: "Between the training at the beginning of the workshop and the very last one, you see..." [a small difference/ a major difference / a huge difference]
Providing feedback	"The last time you gave feedback to a colleague, it was because..." Presentation of a brief video (2'): "Providing feedback". Facing the camera, one actress explains that, to provide a feedback, one should present the positive first and make suggestion. Third training session based on the same fictitious case in groups of three: one asked for feedback, the second gave feedback, and the third observed the discussion and then gave feedback about it. Then, they switched roles. Debriefing: "Between the training at the beginning of the workshop and the very last one, you see..." [a small difference/ a major difference / a huge difference]
Conclusion	Round table: "One important idea I leave with is..."

Managers' Intervention Protocol

PART 1: GROWTH MINDSET INTERVENTION

Sequences	Activities
Introduction and trust-building exercises	Introduction of the participants: "My name is ... and a few people here knows about me that..."
Creating an expectation : Why do I want to progress?	"In your professional life, you have had..." (1 job/2 or 3 jobs/4 or 5 jobs/more than 5 jobs". "For instance, you have been..." "One aspect you particularly appreciate in your current job is..." "Some of the things you love most about my job are..." Self-reflection video: "Meaningful moments at work" (2'20). Based on the work of King (2001), this motion design video invites participants to think about a meaningful moment they experienced recently at work. This could be a moment where they felt particularly useful, connected to others, or proud of accomplishing something difficult and to remember and relive this specific moment. Finally, participants think of what they would like to do in order to experience more meaningful moments like that one. "We all experience moments that might seem trivial but which, with hindsight, contribute to the meaning of our work. In pairs, each one of you can look back on one of these moments." Self-reflection video: "Reflect on your aspirations" (3'05). Based on the work of King (2001), this motion design video invites participants to project themselves into the future and to imagine the best version of themselves, and then, the worst. "In your case, being able to become the "best version of you" one day, professionally, seems to you..." "To get closer to the "best version of me", I could, for example, try to get even better at ..."
Diving into a story to ease the message delivery	Introduction of the thriller miniseries called "Call For Action" and presentation of its teaser (1'10). Written, produced and directed with an international team, Call For Action is a Netflix-standard thriller series created by Korda & Company. The concept: Dorian Bonham is in charge of the secret operations of a defense agency affiliated with the UN. In the event of a mission failure, he has access to technology that sends him back in time and offers him a second chance to change the course of history. Introduction of the main characters and gamification of the workshop: "Congratulations! After a lot of hard work, you have just been admitted into the mysterious Agency. There is one last step to become a real secret agent: you have to find a pseudonym composed of an animal name and an adjective!" The numbers game: "Upon arrival, you will be given your access code to the Agency's encrypted messaging system. For security reasons, this code cannot be entered anywhere. Be prepared to memorize the numbers." "How many numbers do you think you can memorize in order?" Numbers appeared and disappeared on the screen, and individuals were instructed to try to remember the highest number of digits. "How many numbers do you think you could remember in order with practice?" Call For Action, episodes 1 (4'26), 2 (6'01) and 3 (3'45). After each episode, a quick debriefing through a game: participants are split in two teams and they confront each other in a ping-pong of ideas (i.e., "The worst advice we could give Dorian..." and "Very concretely, Dorian should not have...").

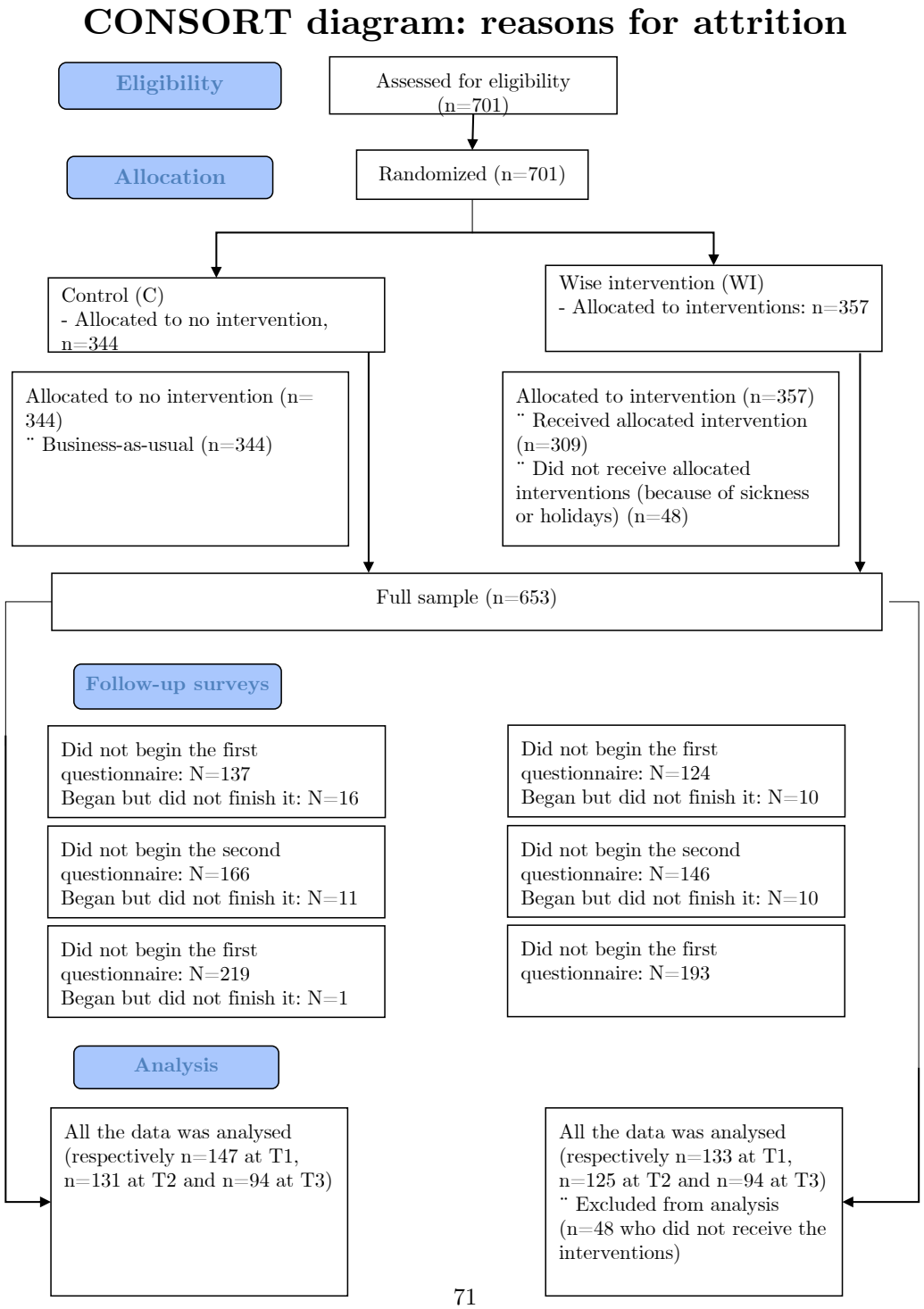
Encouraging a growth mindset	In the miniseries, one of the main characters said, ``Whatever you do for a living, all of us have the power to develop and grow our own abilities".  Presentation of a popular science video: ``Do you know your potential?" (7'16). They key messages delivered by an expert (i.e., the president of the experimenter's company) are about brain plasticity: when you learn something new, your brain gets bigger, more efficient and more powerful. Participants briefly share what they found interesting in the video. Saying is believing exercise: participants share their experience about an activity that was initially difficult for them but in which they persevered and improved in pairs. "One important thing I take away from this exchange is...". "To get closer to the "best version of you in the future" at work, what you already do best on a daily basis is..." "Lately, one little thing that has helped me progress is for example..." "To get closer to the "best version of you in the future" at work, you would like to be even more..."
Promoting a growth mindset as managers	After a lunch break: "The desire to learn, among your employees, is important for..." Presentation of a popular science video: ``Can we promote the motivation to learn?" (5'39). The key message delivered by the expert facing the camera (i.e., the president of the experimenter's company) was that managers can promote an organizational growth mindset, especially by being humble. Participants briefly share what they found interesting in the video.
Taking action	Managers identify a domain in which they want to increase their subordinates' desire to learn and take parti in a peer-coaching session. In pairs (i.e., one coach and one coached), one coach helps his or her coached to achieve his or her goal through questioning. "What will you do with all this? During this workshop, you were able to step back and reflect on your work and some of your aspirations. Perhaps this workshop has further strengthened your desire to learn? The method you are about to discover can help you take action." Presentation of the WOOP motion design video (3') to help people establish new behaviors. This method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., ``If..., then, I will...").
Conclusion	Finishing the story: "What you want Celeste to do first is to bring Dorian to..." Call For Action fourth and final episode (5'10). Round table: "One important idea I leave with is..."
Taking action	Managers identify their main obstacle in the deployment of and take parti in a peer-coaching session. In pairs (i.e., one coach and one coached), one coach helps his or her coached to achieve his or her goal through questioning.
Conclusion	"One important idea I leave with is..."

PART 2: FEEDBACK TRAINING

Sequences	Activities
Introduction and trust-building exercises	Introduction of the participants: "My name is ... Among the things I love about my job, there is..."
Defining a feedback	"A feedback is a constructive comment addressed to the author of a work to help him/her to progress." Presentation of a video about the Beatles (1'44): Ringo Starr improved with feedback from the other band members. First training session based on a fictitious case. Debriefing: "As Alex, the hardest part about getting feedback from Sam is..." "And so, for Alex, it is especially difficult..." "As Sam, the hardest part about giving Alex feedback is..."
Asking for feedback	"In your case, receiving more feedback would be especially useful for..." Presentation of a brief video (2') : "Receiving feedback". Facing the camera, one actress explains that, to receive a feedback, one should ask for one, rephrase it, ask for clarification and advice and take action. Second training session based on the same fictitious case in groups of three: one asked for feedback, the second gave feedback, and the third observed the discussion and then gave feedback about it. Then, they switched roles. Debriefing: "Between the training at the beginning of the workshop and the very last one, you see..." [a small difference/ a major difference / a huge difference]
Providing feedback	"The last time you gave feedback to a colleague, it was because..." Presentation of a brief video (2'): "Providing feedback". Facing the camera, one actress explains that, to provide a feedback, one should present the positive first and make suggestion. Third training session based on the same fictitious case in groups of three: one asked for feedback, the second gave feedback, and the third observed the discussion and then gave feedback about it. Then, they switched roles. Debriefing: "Between the training at the beginning of the workshop and the very last one, you see..." [a small difference/ a major difference / a huge difference]
Asking and providing feedback as a manager	"As a manager, do you ever offer feedback to someone in your team?" " As a manager, you most often use feedback to..." Presentation of a popular science video: ``Why we should focus on talents?" (5'49). The key message delivered by the expert facing the camera (i.e., the president of the experimenter's company) was that the best-performing companies are those in which employees can do what they are best at every day. Participants briefly share what they found interesting in the video. "You want to give feedback to an employee to an employee who has not asked for it. What precautions do you think you should take? "You want to ask for feedback to an employee who has not offered any. What precautions do you think you should take?" Fourth training session based on a new fictitious case in groups of three: one is the manager and gives a feedback, the second is a subordinate, and the third observed the discussion and then gave feedback about it. Then, they switched roles. Debriefing: "Between the training at the beginning of the workshop and the very last one, you see..." [a small difference/ a major difference / a huge difference]
Taking action	Managers identify their main obstacle in the deployment of and take parti in a peer-coaching session. In pairs (i.e., one coach and one coached), one coach helps his or her coached to achieve his or her goal through questioning.
Conclusion	"One important idea I leave with is..."

Complementary analyses

Attrition - Consort Diagram



Differential Attrition - Subordinates

Description of the subordinates who were not retained by condition:

Table 7: Descriptive summary of the attrition of subordinates by condition

	Control N=197	Treated N=168	p.overall
Response Rate at T1 (in %)	32.5 (45.1)	33.0 (45.7)	0.917
Response Rate at T2 (in %)	21.7 (40.6)	26.3 (43.3)	0.299
Response Rate at T3 (in %)	22.2 (41.6)	22.0 (41.6)	0.965
Gender:			0.647
Men	60 (33.1%)	56 (36.1%)	
Women	121 (66.9%)	99 (63.9%)	
Job Tenure	3.12 (4.06)	3.95 (4.76)	0.088
Company Seniority	16.6 (12.8)	18.0 (12.9)	0.339
Feedback Environment at T1	5.05 (1.10)	5.32 (1.02)	0.189
Feedback-Seeking at T1	4.58 (1.43)	4.85 (1.26)	0.274
Perceived Humility at T1	4.68 (1.53)	5.10 (1.30)	0.129

The attributes of subordinates who were not retained were alike in both conditions. Indeed, none of the other individual characteristics (job tenure and company seniority, perceived humility and feedback seeking behaviors) predicted differential attrition (all $ps>.05$). Only one marginal difference appeared when looking at gender ($z=2.43$, $p=.01$, F test). Specifically, more women were retained in the treatment condition than in the control condition, whereas more men were retained in the control condition than men in the treatment condition.

Differential Attrition - Managers

Description of the managers who were not retained:

Table 8: Descriptive summary of the attrition of managers by condition

	Control N=21	Treated N=32	p.overall
Response Rate at T1 (in %)	46.0 (50.0)	50.0 (50.8)	0.780
Response Rate at T2 (in %)	20.0 (33.3)	13.8 (30.6)	0.494
Response Rate at T3 (in %)	47.6 (51.2)	25.0 (44.0)	0.105
Gender:			1.000
Men	10 (47.6%)	15 (48.4%)	
Women	11 (52.4%)	16 (51.6%)	
Job Tenure	4.92 (5.08)	4.13 (5.01)	0.584
Company Seniority	22.2 (10.4)	20.3 (9.19)	0.501
Expressed Humility at T1	6.22 (0.84)	6.53 (0.35)	0.323

The attributes of the managers who were not retained were very similar in the treatment and control conditions (all ps>.05).

The trainers in the feedback training had no impact on the humility expressed by the managers (p>.05, t test).

Trainer effects

Study 1

- Feedback environment

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.2041	1.1482	0.18	0.8594
Feedback Environment at T1	0.8750	0.2067	4.23	0.0001
Trainer of the Mindset Intervention	0.2227	0.3717	0.60	0.5508
Feedback Environment*Trainer	-0.0326	0.0661	-0.49	0.6228

Table 9: Trainer effect on the feedback environment after the mindset intervention treatment for subordinates

Those leading the mindset intervention had no impact on the feedback environment (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.7294	0.9422	0.77	0.4411
Feedback Environment at T1	0.7997	0.1713	4.67	0.0000
Trainer in the Feedback Training	0.0258	0.3304	0.08	0.9378
Feedback Environment*Trainer	-0.0046	0.0578	-0.08	0.9369

Table 10: Trainer effect on the feedback environment after the feedback training treatment for subordinates

Trainers in the feedback training had no impact on the feedback environment (p>.05, t test).

- Feedback seeking

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.9993	0.7295	2.74	0.0076
Feedback Seeking at T1	0.4999	0.1454	3.44	0.0009
Trainer of the Mindset Intervention	0.0978	0.2573	0.38	0.7051
Feedback Seeking*Trainer	-0.0142	0.0500	-0.28	0.7771

Table 11: Trainer effect on feedback seeking after the mindset intervention treatment for subordinates

Those leading the mindset intervention had no impact on feedback seeking (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.7551	0.6477	2.71	0.0082
Feedback Seeking at T1	0.5109	0.1275	4.01	0.0001
Trainer	0.2169	0.2319	0.94	0.3523
Feedback Seeking*Trainer	-0.0235	0.0451	-0.52	0.6043

Table 12: Trainer effect on feedback seeking after the feedback training treatment for subordinates

The trainers in the feedback training had no impact on feedback seeking (p>.05, t test).

Study 2

- Perceived humility of the managers according to their subordinates

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.5066	1.1760	0.43	0.6678
Perceived Humility at T1	0.7675	0.2128	3.61	0.0005
Trainer	0.1394	0.3891	0.36	0.7212
Perceived Humility*Trainer	-0.0014	0.0703	-0.02	0.9843

Table 13: Trainer effect on perceived humility after the mindset intervention treatment for subordinates

Those leading the mindset intervention had no impact on the humility perceived by subordinates (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.1007	0.9769	1.13	0.2633
Perceived Humility at T1	0.7088	0.1799	3.94	0.0002
Trainer	-0.0867	0.3555	-0.24	0.8078
Perceived humility*Trainer	0.0208	0.0638	0.33	0.7457

Table 14: Trainer effect on the perceived humility after the feedback training treatment for subordinates

Trainers in the feedback training had no impact on the humility perceived by the subordinates (p>.05, t test).

- Expressed humility of managers

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.5536	1.7729	1.44	0.1632
Expressed Humility at T1	0.5594	0.2890	1.94	0.0653
Leader for the Mindset Intervention	-0.9638	0.6971	-1.38	0.1801
Expressed Humility*Trainer	0.1540	0.1100	1.40	0.1746

Table 15: Trainer effect on the expressed humility after the mindset intervention treatment for managers

Those leading the mindset intervention had no impact on the humility expressed by the managers (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.8336	1.5035	1.22	0.2393
Expressed Humility at T1	0.6577	0.2431	2.71	0.0150
Trainer in the Feedback Training	-0.7180	0.5698	-1.26	0.2246
Expressed Humility*Trainer	0.1217	0.0898	1.36	0.1929

Table 16: Trainer effect on the expressed humility after the feedback training treatment for managers

Chapter 2: The Impact of Proactive and Delegation Mindsets in the Workplace: Experimental Evidence

1 Introduction

Over the last few decades, research has increasingly highlighted that individuals in organizations are no longer "passive, reactive respondents to their context" (Parker et al., 2010, p. 828) but play an active role in shaping their roles, careers, work environment, social context, and organizations (Strauss and Parker, 2014). Proactivity at work involves challenging the current situation and working toward what "could be". Specifically, proactivity is a self-initiated, anticipatory action that aims to change and improve one's situation or oneself (Parker et al., 2006).

Proactivity is associated with a range of positive outcomes, including high job performance, career success (Fuller and Marler, 2009) and high life satisfaction (Greguras and Diefendorff, 2010). It has been suggested that proactive individuals contribute to organizational effectiveness in dynamic and uncertain environments because in such contexts, it is not possible to anticipate and specify all that is required of employees; instead, employees need to take initiative and actively take charge of their environments (Parker et al., 2010). It is therefore clear that proactivity can benefit both individuals and organizations.

However, for employees to be proactive, managers must give them the opportunity to do so. Organizations are increasingly concerned about how managers delegate decision-making power to their subordinates (Al-Jammal et al., 2015). For flat structures (i.e., ones with fewer hierarchical layers than traditional hierarchies) to succeed, managers need to delegate authority to their employees and give them more autonomy. Therefore, an important challenge facing today's organizations is increasing delegation by superiors so that subordinates can be more

efficient at work (Al-Jammal et al., 2015). However, according to Mohammadi et al. (2016), there are several issues that can prevent managers from delegating to their subordinates (e.g., lack of trust in their subordinate's capacities, etc.). While subordinates must accept this delegation to be proactive, they also face many barriers that prevent them from accepting it (e.g., fear of being criticized, etc.; Mohammadi et al., 2016).

However, previous research has highlighted the relationship between proactivity and mindset of intelligence, that is the belief regarding the malleability of one's abilities. Indeed, it seems that when the context promotes a growth mindset of intelligence (i.e., the belief that abilities can be developed), individuals may infer that many opportunities exist within a role. For instance, in the educational domain, Fuesting et al. (2019) found that students who were randomly assigned to classes taught by a professor who expressed a growth mindset (vs. a fixed mindset, that is the belief that abilities are fixed and cannot be grown) reported a higher perception than other students that STEM courses and careers would offer them opportunities to pursue their goals. Moreover, in the occupational context, Canning et al. (2019) found that employees who perceived their organization to endorse a growth mindset reported that their company's culture was characterized by more encouragement to be innovative and by more trust, which is also a determinant of delegation (Mohammadi et al., 2016). In addition, Benson-Greenwald and Diekman (2021) designated the relationship between proactivity and a growth mindset of intelligence as causal by showing that growth mindset contexts foster proactivity.

The relationship between growth mindset and proactivity can partly be explained by research on prevention and promotion focus (Higgins, 1997). Promotion focus is characterized by a focus on achieving positive outcomes, such as gains, growth, and advancement, and individuals with a promotion focus are driven by a desire to achieve success and motivated by potential rewards. In contrast, prevention focus is characterized by a focus on avoiding negative outcomes, such as losses, harm, and failure. Studies have shown a positive link between proactivity and promotion focus. For instance, Parker and Collins (2010) found that employees with a promotion focus were more proactive in their work than those with a prevention focus. Similarly, Seibert et al. (1999) showed that individuals with a promotion focus were more likely to take initiative and be proactive in their work. In addition, promotion-focused individuals were more likely to delegate tasks than prevention-focused individuals (Parker and Wu, 2014). Indeed, delegation can be an effective strategy for achieving goals because it allows individuals to leverage the strengths and abilities of others to accomplish more than they could on their own. Thus, a promotion focus may not only lead to greater proactivity but also to more effective use of resources through delegation. However, individuals with a growth mindset tend to be more achievement-oriented and seek out new opportunities (Mueller and Dweck, 1998). This is consistent with a promotion focus, which is the tendency to focus on gains, achievements, and opportunities. On the other hand, individuals with a fixed mindset tend to avoid failure and losses, which is consistent with a prevention focus, the tendency to focus on avoiding losses, failures, and threats. Therefore, having a growth mindset of intelligence may lead individuals to view proactive behaviors as an opportunity for growth and development rather than a risk of failure.

However, the proactive mindset, that is the belief regarding the malleability of proactivity, has not yet been studied. A fixed mindset of proactivity is characterized by the belief[9] that proactivity is an innate trait, with some individuals being naturally proactive and others not. Conversely, a growth mindset of proactivity involves the belief that proactivity is an ability that can be developed and honed over time. In addition, no research has been conducted yet on the delegation mindset. A fixed mindset of delegation views delegation as a fixed quality, with some individuals having a natural aptitude for delegation and others lacking this ability. In contrast, a growth mindset of delegation sees delegation as an ability that can be developed and refined with practice and experience.

Indeed, while mindset theory were originally dedicated to intelligence (Bandura and Dweck, 1985), implicit theories (aka mindsets) are broader than only the conception of intelligence: such theories are, more widely, the assumptions people make about the malleability of personal attributes (Dweck et al., 1995). People may view one's attributes as fixed characteristics (i.e., a fixed mindset) or as malleable qualities that can be developed (i.e., a growth mindset). For instance, research has pointed out implicit theories of individual characteristics (e.g., personality, Chiu et al., 1997b; creativity and wisdom, Sternberg, 1985; morality, Chiu et al., 1997a; self-regulation, Burnette et al., 2013; willpower, Job et al., 2015; health, Schreiber et al., 2020; and leadership, Hoyt et al., 2012), as well as interpersonal theories (e.g., romantic relationships, Rands and Levinger; 1979; and groups, Rydell et al., 2007) and specific abilities (e.g., negotiation, Kray and Haselhuhn, 2007; and drive, Nicolleau et al., 2022). These theories are "implicit" because they are often not directly expressed or conscious to the individual holding them. This characteristic makes them malleable and subject to change (Dweck and Leggett, 1988).

Proactive and delegation mindsets could play an important role in shaping employees' behaviors and performance in the workplace. Indeed, whether individuals have a fixed or a growth mindset (i.e., respectively viewing their attributes as fixed or malleable) determines their behaviors. For instance, viewing creativity as a quality that can be developed leads people to be more creative than people who view creativity as a fixed talent (e.g., Yu, 2020). As another example, believing that one's negotiating ability can be developed makes individuals better at negotiating than individuals who view one's negotiating abilities as fixed (Kray and Haselhuhn, 2007). Although some individuals may have a natural tendency towards a growth mindset for a particular attribute, research has demonstrated that growth mindsets can also be induced through deliberate "mindset interventions". For instance, participants who read an article titled "Negotiation Ability Is Changeable and Can Be Developed", which stated that "negotiating is a dynamic skill that can be cultivated and developed over a lifetime", led people to endorse a stronger growth mindset regarding negotiation and to negotiate better than people who read an article titled "Negotiation Ability, Like Plaster, Is Pretty Stable Over Time," which stated "negotiation ability has set like plaster and will never soften again" (Kray and Haselhuhn, 2007, p.53). As another example, through a creative game, Yu (2020) helped students enhance their

[9]It is important to note that our focus is exclusively on the mindsets of individuals in this paper.

growth mindsets of creativity, which led them to be more creative. Thus, promoting growth mindsets can lead to an increase of associated behaviors.

Contribution and Aims of the Present Paper

This field experiment is the first to examine the relationship between individuals' beliefs in whether proactivity and delegation are innate characteristics or skills that can be honed through effort and practice (i.e., proactive and delegation mindsets), and their workplace behaviors. Hence, the purpose of this paper is to examine the significance of proactive and delegation mindsets in comprehending proactivity and delegation behaviors.

Moreover, this experiment is the first attempt to promote growth mindsets of proactivity and delegation through brief interventions. Indeed, this field experiment is groundbreaking in its implementation of two mindset interventions aimed at promoting growth mindsets of 1) proactivity and 2) delegation among working adults within a business organization.

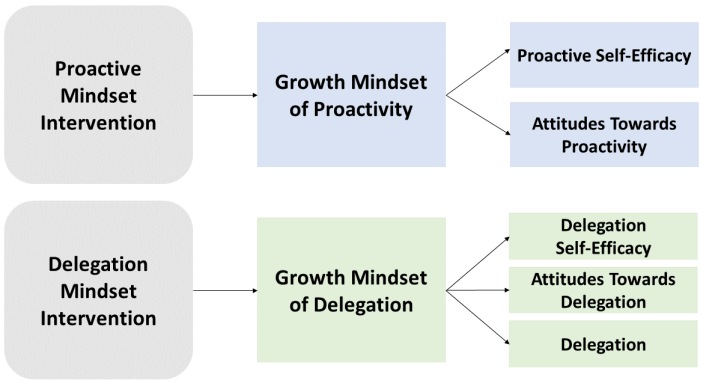


Figure 8: Visualizing the Objectives of the Current Study

To test the relationships between mindsets (specifically, proactivity and delegation) and corresponding workplace behaviors, we first measured the mindsets (i.e., the perception that these qualities can be developed). However, in a field setting, objectively measuring proactive and delegation behaviors can be challenging, since there are no clear Key Performance Indicators (KPIs) to assess these qualities. Therefore, we relied on self-efficacy - a reliable predictor of behavior - as well as attitudes, which typically predict intention (de Vries et al., 1988). In addition, we measured the delegation reported by both managers and subordinates (see 2.4.1 and 2.4.2 for more details). We measured these outcomes before and after treatment in both a control condition (i.e., business as usual condition) and a treatment condition (i.e., mindset intervention).

2 Method

Development of the Procedure

This study took place in a French organization specializing in the management of healthcare and personal protection. Its Chief Executive Officer described the company as having a very process-oriented culture. The employees handle the health reimbursements of two million French people on a daily basis. Proactivity is not part of the culture, and the management is overwhelmed by issues that are raised by the employees. This company counted approximately 900 employees[10].

The experiment was decided and developed with the company's CEO, the Human Resources Director and one of her subordinate. We met with these stakeholders for the first time in September 2020 as we were organizing their executive committee. They mentioned the issue of proactivity among their employees, and we proposed to conduct this experiment. We held four meetings between October and January 2021 to organize this experiment, including determining the questionnaire content, number of participants, etc. However, our requests for randomized participant selection went unanswered. Indeed, the HR policy of the company required the approval of each team's participation in the experiment by the firm's directors[11], thereby making it impossible for us to implement our desired approach of randomizing the samples.

Participants and Design

To have two sufficiently large sample sizes and to have the most comparable samples in terms of positions and/or jobs, we selected employees from only one department of the company, the Operations Department[12]. We chose this department because it has the highest volume of processed work, making it the most suitable for our needs. We first selected 388 employees. Since randomizing the samples was not feasible, the decision regarding the participation of natural teams (i.e., one manager and their subordinates who work together) in the experiment was left to each director (i.e., manager of managers) within the Operations Department. As a result, some teams were selected to participate, while others were not.

Thirty-five managers and their subordinates were assigned to the treatment condition (N=216) and took part in the interventions. Another group was composed of 11 managers and their teams (N=172). These employees were very similar to the treated ones in terms of positions and/or functions (jobs including health expenses, enrollment and third-party payment management), but they did not receive the interventions.

Selected participants from both conditions received an email in early February 2021 from their HR Director asking them to take part in a survey. The survey was presented as a questionnaire to measure the perception of proactivity within the company, and the answers were

[10]NB: "Employees" refers to all workers, "managers" refers to supervisors and "subordinates" stands for employees who are not managers.

[11]Here, "directors" refers to the supervisors of managers.

[12]The other departments that we did not include in the experiments are sales, specialists and departments based in Portugal.

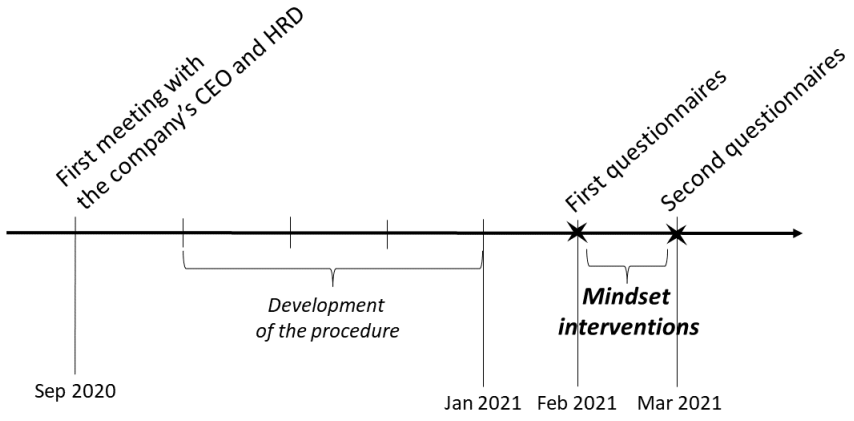


Figure 9: Timeline of the Present Study

collected by an independent firm that guaranteed anonymity for the participants. A link to the survey was attached in the email. One week later, a reminder was sent by the independent company to the employees who had not already completed the survey.

The interventions took place between mid-February and mid-March 2021. Then, the same questionnaire was sent again to all participants. Each time questionnaires were sent, employees had ten days to answer.

Procedure

Because this experiment took place in early 2021, a time when France was still deeply affected by the ongoing COVID-19 pandemic, the interventions were all delivered by videoconference (i.e., Zoom conferencing).

In the treatment condition, all the employees participated in a two-hour "proactivity intervention". The aim of this intervention was to foster a growth mindset regarding proactivity among participants. Specifically, the main goal of the intervention was to convince participants that proactivity is an ability they can develop.

Moreover, the managers participated in a second two-hour intervention: a "delegation intervention". Its aim was to foster a growth mindset regarding delegation among participants. In other words, the main goal of the intervention was to convince managers that delegation is a quality that can be developed.

The proactivity interventions were delivered by two trainers from the firm who were trained beforehand by the experimenter. The delegation interventions were delivered by one of these two trainers. The facilitators for the sessions were chosen from the company's HR department. Since

the team members had a non-hierarchical position in relation to the participants and training interventions fell within the department's responsibilities, they were a natural fit for the role. Before the sessions began, the facilitators received one day of training from the experiment. They first participated in the workshops as subordinates and then practiced leading each sequence, receiving feedback from others, and no trainer effect was found (see Appendix 5).

All the information, key messages and protocols delivered within the interventions were embodied in videos and presentation supplements. All the materials used in these interventions were created by our team. The videos used in the interventions were presented by actors, such as the thriller miniseries. Additionally, some videos were presented by workers from the experimenter's company, like popular science videos. Some videos were motion-designed with voice-over narration and animated graphics. The precise protocols of this intervention is described in Supplementary Materials 5.

The Proactivity Intervention

In the present study, to induce a growth mindset regarding proactivity, employees were invited to participate in a two-hour workshop called "Reboot: Initiative". Each workshop included approximately ten employees, and subordinates and managers participated in the workshop separately.

The intervention began with an introduction and a trust-building exercise; that is, a suitable environment for participation was created, and the workshop topic was introduced. First, participants introduced themselves with an ice-breaker and questions about what they liked best about their jobs. Then, the questions concluded with one about proactivity within the company (e.g., when they have been proactive at work, what the proactive behavior was, how do they determine whether proactivity is satisfactory, what inhibitions do they face in being more proactive, why they would like to be more proactive at work).

Then, in order to enhance a growth mindset, we follow the three steps suggested by McGonigal (2015): discovery of the new paradigm, confirmation of this new paradigm and public expression of it (i.e., also known as "saying-is-believing exercise", Higgins and Rholes, 1978). Thus, they watched videos from a thriller miniseries, in which one of the main characters eventually said, "You need to think before you act". To understand how to think before acting, participants were invited to watch a popular science video. The key message was about proactivity: the happiest people are those who focus their energy on what they can change. Then, they were invited to briefly share what they found interesting about the video. After that, as a saying-is-believing exercise, they were asked to think about what subordinates and managers could do to make everyone more proactive.

Finally, they were asked what they could personally do to be more proactive at work. Then, a video of the WOOP method (Oettingen, 2012) was shown to help people establish a new behavior. WOOP (i.e., wish, outcome, obstacle, plan) is a science-based mental strategy that people can use to establish preferences and change habits. This method consists of four steps.

First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfil their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (e.g., "If..., then, I will..."). To conclude the intervention, participants briefly shared one idea that they would take away from the workshop.

The Delegation Intervention

To induce a growth mindset regarding delegation, managers were invited to participate in a two-hour workshop called "Reboot: Team Builder". Each workshop included approximately ten managers.

The intervention began with an introduction and a trust-building activity. Specifically, participants introduced themselves with ice-breaker questions about what they liked the best about their jobs. Then, the questions concluded with their management role (e.g., in what way do they consider their management to be satisfactory, how do they try to make their team great).

This intervention also follows the three steps suggested by McGonigal (2015) (i.e., discovery of the new paradigm, confirmation of this new paradigm and public expression of it). So, participants watched then a first popular science video about power and status. Citing the work of Keltner (2017), the speaker explains that on one hand, giving power to someone makes him or her more focused, perseverant, and creative. On the other hand, we do not accept that someone with a low status (described as the level of admiration felt toward someone) should have power over us. The video explains that employees who make the most suggestions are the ones who have the lowest promotion rates and pay increases: managers – in an unconscious manner – tend to punish subordinates who have a lower status but who want to have some power. Hence, subordinates will have no interest in being proactive. After the video, participants were invited to briefly share what they found interesting in the video. Then, they were asked to think about what they could do to develop the autonomy of their subordinates. After that, as a saying-is-believing exercise, they shared in pairs about a situation in which they boosted the confidence and autonomy of one of their subordinates.

Then, they watched some clips from the thriller miniseries[13], and one of the main characters said, "You got to find the best in people". Participants were then asked about the last time they observed this statement to be true and how they had previously found the best in a member of their team (i.e., a saying-is-believing exercise). Then, they watched a second popular science video on key strengths. Based on a survey led by the Gallup Organization (i.e., a US analytics and advisory company known for its public opinion polls conducted worldwide), the speaker explains that organizations in which employees use their key strengths on a daily basis (i.e.,

[13]This was the same miniseries used in the proactivity intervention, but the clips came from another season: the main characters were the same, but the story was different because it was aimed at enhancing another specific mindset.

employees do what they do best at work every day) are characterized by the highest level of performance and well-being. Moreover, when companies focus on key strengths (vs. the weak points) of their employees, they see significant improvements in economic performance and even a drastic decrease in industrial accidents. Therefore, managers should identify the main strengths of their subordinates and then assign tasks to them accordingly. After the video, participants were invited to briefly share what they found interesting about the video. Then, as a third saying-is-believing exercise, they were invited to think about what they already do to mobilize the key strengths of their subordinates.

Finally, they were asked to think about what actions they would like to take after the intervention. Then, a video of the WOOP method was shown to help them establish new behaviors. To conclude the intervention, participants briefly shared one idea that they would take away from the workshop.

Hypotheses and Dependent Measures

This study is the first to examine the relationship between individuals' proactive and delegation mindsets (i.e., the beliefs that proactivity and delegation are abilities that can be developed) and their workplace behaviors.

Based on prior research (e.g., Kray and Haselhuhn, 2007; Yu, 2020) that has demonstrated a positive correlation between growth mindsets and associated behaviors (such as negotiation and creativity), we propose hypotheses that cultivating a growth mindset of proactivity or delegation would lead to an increase in proactive or delegating behaviors. Hence, our exploratory hypotheses can be outlined as follows:
H1a: A proactive mindset is positively correlated with proactivity self-efficacy and positive attitudes about proactivity.
H2a: A delegation mindset is positively correlated with delegation self-efficacy, positive attitudes about delegation and delegation behaviors.

According to Mohammadi et al. (2016), subordinates encounter several barriers that hinder their acceptance of delegation from their managers, including a lack of self-confidence in their abilities to perform well. Therefore, this study aims to investigate the correlation between managerial delegation and subordinates' self-efficacy in engaging proactively:

H3: Perceived delegation is positively correlated with proactivity self-efficacy. Additionally, if there is a significant correlation between perceived delegation and proactivity self-efficacy, we intend to investigate whether this relationship can be partially elucidated by a proactive growth mindset (see Figure 10 for a graphic representation of this mediation hypothesis):

H4: The relation between perceived delegation and proactivity self-efficacy is mediated by a proactive mindset.

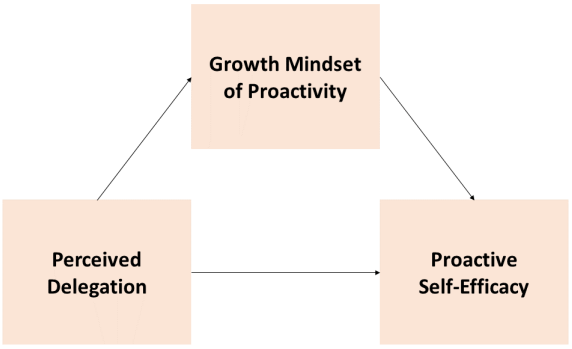


Figure 10: Visualizing the Mediation Hypothesis

Additionally, this study is pioneering in examining the potential of brief mindset interventions to promote growth mindsets of proactivity and delegation and the resultant impact on workplace behaviors:
H1b: After a proactive intervention, the growth mindset regarding proactivity increases among employees.
H1c: After a proactive intervention, proactivity self-efficacy increases among employees.
H2b: After a delegation intervention, the growth mindset regarding delegation increases among managers.
H2c: After a delegation intervention, delegation self-efficacy and delegation behaviors increase among managers.

To test these hypotheses, employees twice (i.e., before and after treatment) completed a questionnaire that included measures of their proactive mindset and proactive outcomes as well as their delegation mindset (for managers only) and delegation outcomes. We aimed to include three items for each scale, as this would allow us to calculate reliability but also limit the length of the whole questionnaire. Therefore, some adaptations as described below were made.

Responses were presented on a seven-point Likert scale (1 = "total disagreement", 7 = "total agreement"), and all scales are presented in Appendix 5.

Scales for All Employees

To test the existence of the implicit theory of proactivity, we measured the participants' proactive mindset, that is, the perception that proactivity is a quality that can be developed. Moreover, to examine the relevance of this mindset in organizations, we used two indicators: proactivity self-efficacy, that is, the belief that an individual is capable of being proactive, and attitude toward proactivity, which is the sense that being proactive is good.

Proactive Mindset

We used three items to measure proactive mindset: "No matter who we are, we can always develop our ability to take initiative"; " While progressing in our work, we become capable of taking initiative more"; and "Even if we rarely take initiative at the beginning, we can develop our autonomy" (α =.82). These items were translated in French and adapted from Chen and Shane Tutwiler (2017) by changing "science ability" to "proactivity" and by reducing the number of items. We retained only items assessing growth mindset and dropped the fixed mindset items.

Proactivity Self-Efficacy

We used three items to measure the feeling of proactivity self-efficacy: "I feel capable of trying new things in my work"; "I often take the initiative in my work"; and "I have opportunities to take the initiative in my work" (α =.73). These items were developed based on the guide for constructing self-efficacy scales (Bandura, 2006) by targeting one particular domain of interest (i.e., proactivity), and items are phrased in terms of *can do* (i.e., judgment of capabilities).

Attitude Toward Proactivity

We used three items (α =.85) to measure attitude toward proactivity: "I think it's important to take the initiative at work"; "I think we must try new ways of doing it at work"; "Taking the initiative helps make work interesting". As we did not find any scale measuring attitudes toward proactivity in the literature, we created this scale. However, regarding its alpha value, this scale can be considered relevant even if newly developed.

Furthermore, to assess the significance of a delegation mindset on delegation behaviors, we utilized two measures as indicators: perceived delegation (i.e., the extent to which their manager delegates work to them) and attitude toward delegation (i.e., whether their managers should delegate work to them).

Perceived Delegation

We used three items to measure the delegation of work by their manager: "My manager does not require that I get his/her approval before making decisions" (adapted from the original item by transforming "input or approval" by "approval"); "My manager lets me make decisions by myself, without consulting with him/her"; "My manager frequently gives me her/his opinion about a file but then lets me make my own decision" (adapted from the original scale "My supervisor permits me to get needed information from him/her and then make my own decisions" to make it easier to understand in French, α =.86). These items were translated in French and adapted from the delegation of authority scale developed by Schriesheim et al. (1998) by replacing the terms "supervisor" with "manager" (i.e., more commonly used in business organizations) and by reducing its number of items. We retained items that were the easiest to understand in French.

Attitude Toward Delegation

We used three items (α =.79) to measure attitude toward delegation: "I think it's important that my manager gives me power to make decisions about some matters"; "In my organization, I think we should give people a lot of autonomy"; "Having real autonomy is beneficial". As we did not find any scales measuring attitudes toward delegation in business organization, we created this scale. However, regarding its sufficient alpha value, this scale can be considered relevant even if newly developed.

Additional Scales for Managers Only

To test the existence of the implicit theory of delegation, we measured the delegation mindset (i.e., perception that delegation is a capacity that can be developed). In addition, to examine the relevance of this mindset in workplaces, we used three more indicators: delegation self-efficacy (i.e., the belief that one is capable of delegating), attitude toward delegating (i.e., is delegation a good thing?) and delegation behavior (i.e., authority they have to delegate).

Managers answered the same scales as the subordinates for proactive mindset (α =.78), proactive self-efficacy (α =.84), attitude toward proactivity (α =.87), perceived delegation (α =.93) and attitude toward delegation (α =.85). In addition, they answered some additional scales.

Delegation Mindset

We used three items to measure the implicit theory of delegation: "Every manager can learn to trust her/his subordinates more"; "As we progress as managers, we delegate more"; "Even if we control a lot at the beginning, we can develop our capacity for delegation" (α =.74). These items were translated in French and adapted from Chen and Shane Tutwiler (2017) by changing "science ability" to "delegation", by selecting only the three items assessing growth mindset, thus reducing the number of items from six to three.

Delegating Self-Efficacy

We used three items to measure the feeling of self-efficacy in delegation: "I feel capable of giving a lot of autonomy to my subordinates"; "I know how to give decision-making power to my subordinates"; and "I succeed in developing the autonomy of my subordinates" (α =.85). These items were developed based on the guide for constructing self-efficacy scales (Bandura, 2006) by targeting one particular domain of interest (i.e., delegation), and items are phrased in terms of *can do* (i.e., judgment of capabilities).

Attitude Toward Delegation

To measure attitude toward delegation, we created a scale of three items (α =.84): "It is important to give decision-making power to my subordinates about some matters"; "In my organization, I think we should give people a lot of autonomy"; "Having real autonomy is beneficial".

We created this scale because we did not find any scale in the literature measuring attitudes toward delegation in business organization. We adapted the same items as in the subordinates' scale, by replacing the terms "my manager" by the first person singular. Because of its sufficient alpha value, this scale can be considered relevant even if newly developed.

Delegation

We used three items to measure the authority managers delegate to their subordinates, adapted from Schriesheim et al. (1998) by switching the focus of the questions, that is, by replacing "my supervisor" with the first person singular and the first person singular with "my subordinates": "Frequently, my subordinates don't have to ask my approval before making a decision"; "I let my subordinates make some decisions without consulting me"; and "I often give my subordinates my opinion about a file and then let them make their own decisions" (α =.78). We kept the same three items used for the subordinates to ensure that the assessments were comparable and translated them in French.

3 Results

Subordinate Samples

Selection of participants were made by the direction of the firm, hence we need to examine whether the samples are comparable.

Descriptions of the subordinates are presented in Table 17. Both groups of subordinates are quite similar in various factors. Indeed, age does not differ across conditions (p>.05, t test). This is also the case for gender, with women representing 93.2% of the control condition and 90.1% of the treatment condition (p>.05, chi-squared test). Moreover, none of the outcomes measured before treatment differ between conditions (proactive mindset, self-efficacy and attitude, perceived delegation and attitude toward delegation, all ps>.05, t tests). However, a few differences appear. First, the response rates for the first questionnaire significantly differ between groups (p<.001, t test), and this is also the case for the second questionnaire (p<.001, t test). Moreover, employees in the treatment condition tend to have marginally longer seniority at the company than those in the control condition (p=.06, t test).

Therefore, analyses are conditioned on company seniority, and attrition must be tested to analyze whether subjects who were retained are comparable with those who were not (see reasons for attrition in Appendix 5). We examine overall attrition (i.e., independent of condition) and differential attrition (i.e., dependent of condition) in both samples of subordinates. Subordinates who were retained are very similar in terms of gender division, age, company seniority and every outcome measured before treatment for both overall and differential attrition (all ps>.05, F-tests).

	Control N=161	Treatment N=181	p-value
Response rate at T1 (in %)	79.4	97.8	<0.001
Response rate at T2 (in %)	66.2	82.7	<0.001
Age	37.8 (8.27)	38.0 (7.75)	0.808
Gender division:			0.403
Men	11 (6.83%)	18 (9.94%)	
Women	150 (93.2%)	163 (90.1%)	
Company seniority	5.40 (4.70)	6.39 (5.17)	0.065
Growth mindset of proactivity: T1	5.25 (1.33)	5.31 (1.43)	0.694
Proactivity self-efficacy: T1	3.95 (1.22)	4.15 (1.31)	0.181
Attitude about proactivity: T1	5.91 (1.05)	5.90 (1.10)	0.932
Perceived delegation: T1	3.64 (1.62)	3.72 (1.46)	0.663
Attitude about delegation: T1	5.53 (1.06)	5.59 (1.05)	0.678

Table 17: Descriptive Summary of Subordinates by Condition

Manager Samples

Descriptions of the managers are presented in Table 18. The manager samples are very alike in terms of response rates, age, company seniority (all $ps>.05$, t tests), gender division ($p>.05$, chi-squared test) and all outcomes measured before treatment (proactive mindset, self-efficacy, and attitude; perceived delegation; attitude about delegation; delegation mindset, self-efficacy, and attitude; and delegation behavior, all $ps>.05$, t tests). However, the manager sample sizes are very small. For this reason, managers in both conditions are examined together for the exploratory analyses.

	Control N=11	Treatment N=35	p-value
Response rate at T1 (in %)	90.9	97.1	0.525
Response rate at T2 (in %)	77.8	88.6	0.435
Age	41.5 (6.53)	43.3 (8.09)	0.447
Gender division:			0.133
Men	1 (9.09%)	13 (37.1%)	
Women	10 (90.9%)	22 (62.9%)	
Company seniority	7.45 (7.71)	7.66 (6.36)	0.938
GM of proactivity	5.67 (0.99)	5.78 (1.15)	0.755
Proactivity self-efficacy at T1	5.23 (1.32)	5.38 (1.15)	0.751
Attitude about proactivity at T1	6.37 (0.82)	6.33 (0.76)	0.910
Perceived delegation at T1	4.57 (1.86)	5.13 (1.42)	0.395
Attitude about delegation at T1	6.30 (0.73)	6.23 (0.82)	0.786
Delegating mindset at T1	6.03 (0.82)	6.23 (0.83)	0.527
Delegating self-efficacy at T1	5.97 (0.81)	5.42 (0.93)	0.088
Attitude about delegating at T1	6.03 (0.88)	6.11 (0.83)	0.815
Delegation at T1	5.33 (1.39)	5.23 (1.03)	0.823

Table 18: Descriptive Summary of Managers by Condition

Proactive Mindset, Self-Efficacy and Attitude

First, to test the congruence of the proactive mindset with proactive behaviors, we examined the relationships among the proactive mindset, proactivity self-efficacy and attitude toward proactivity.

Hypothesis: *H1a: A proactive mindset is positively correlated with proactive self-efficacy and positive attitude regarding proactivity.*

Results: A growth mindset regarding proactivity is positively correlated with both proactive self-efficacy and positive attitude about proactivity. Therefore, *H1a* is confirmed.

Support for results: To test this hypothesis, we examined the correlation between proactive self-efficacy, attitude toward proactivity and proactive mindset. Results are presented in Table 19.

Correlations among Subordinates		
	Proactive Self-Efficacy	Attitude
Attitude about Proactivity	0.32***	
Proactive Mindset	0.53***	0.38***
Correlations among Managers		
	Proactive Self-Efficacy	Attitude
Attitude about Proactivity	0.32*	
Proactive Mindset	0.47**	0.49***

*p<.001 =***, p < .01 = **, p<.05 =**

Table 19: Correlation Matrix of Proactive Mindset, Self-Efficacy and Attitude among Subordinates and Managers

Among the subordinates, a proactive mindset is positively correlated with both proactive self-efficacy and positive attitude toward proactivity (both ps<001, Pearson test). This is also the case among the managers: proactive self-efficacy and attitude about proactivity are both positively correlated with proactive mindset (p<.01 and p<.001 respectively, Pearson tests).

The relationships between proactive mindset and proactive self-efficacy are of moderate strength and positive for both subordinates and managers (r=.53 and r=.47, respectively). The relationship between proactive mindset and attitude about proactivity is positive and weak among subordinates (r=.32) but positive and moderate among managers (r=.49).

Therefore, a proactive mindset is relevant when examining proactivity in the workplace because it is significantly linked with both self-efficacy and positive attitudes which, in turn, are predictors of intention and behavior. In other words, in a business organization, the more one believes that proactivity can be developed, the more likely one is to feel capable of being proactive and the more likely he or she is to believe that proactivity is good. The next section examines whether this is also the case for a delegation mindset.

Delegation Mindset, Self-Efficacy, Attitude and Behaviors

Then, to test the relevance of the delegation mindset in order to understand delegation behaviors, we examined the relationships among delegation mindset and delegation self-efficacy and attitude.

Hypothesis: *H2a: The delegation mindset is positively correlated with delegation self-efficacy, attitude and behaviors.*

Results: A growth mindset of delegation is correlated with both delegation self-efficacy and a positive attitude toward delegation. Therefore, *H2a* is confirmed.

Support for results:

To test this hypothesis, we examine the matrix of correlation of delegation self-efficacy, attitude and behaviors among managers (see Table 20).

	1.	2.	3.
1. Delegating Self-eff.			
2. Attitude about Delegation	0.56***		
3. Delegation	0.50***	0.46**	
4. Delegating Mindset	0.53***	0.70***	0.46**

*p<.001 =***, *p < .01 = ***, *p<.05 =**

Table 20: Correlation Matrix of Delegation Mindset, Self-Efficacy, Behaviors and Attitude among Managers

A delegation mindset is positively correlated with delegation self-efficacy and attitude toward delegating (both *ps*<.001, Pearson tests); as well as delegation behaviors (p<.01, Pearson test). All of these correlations are moderate or strong. Therefore, *H2a* is confirmed.

This section shows that having a delegation mindset is relevant for understanding delegation in organizations. In other words, the more one believes that delegating is an ability that can be developed, the more likely one is to believe delegating is good, to feel capable of delegating and to actually practice delegation. However, is there truly a relationship between the authority delegated by managers and the proactivity of subordinates? This is the question the next section will try to answer.

Perceived Delegation, Proactive Self-Efficacy and Proactive Mindset

In the previous section, we saw that a delegation mindset is correlated with actual delegation behaviors. Now, we explore whether delegation can enhance proactivity by examining the relationship between perceived delegation and proactive self-efficacy.

Hypothesis: *H3: Perceived delegation is positively correlated with proactive self-efficacy.*

Results: Perceived delegation is correlated with proactive self-efficacy among both managers and subordinates. *H3* is thus confirmed.

Support for results:

To test this hypothesis, we examined the correlations between proactive self-efficacy and perceived delegation among both subordinates and managers.

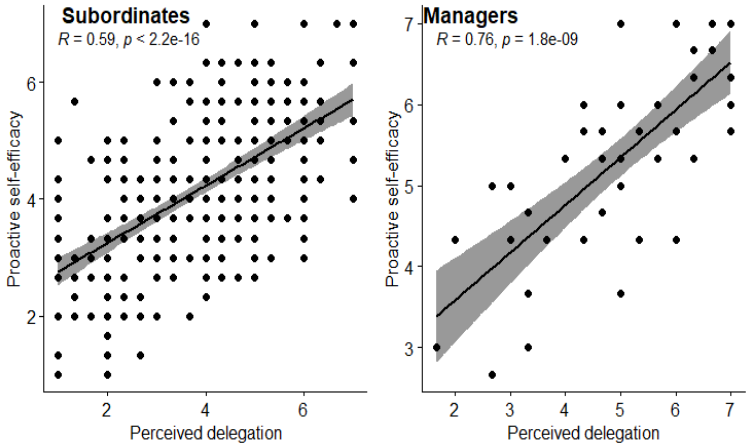


Figure 11: Correlation between Perceived Delegation and Proactivity Self-Efficacy among Subordinates (on the left) and Managers (on the right)

The left side of Figure 11 presents the correlation between perceived delegation and proactive self-efficacy among subordinates. This scatterplot shows a moderate, linear and positive relationship. This relationship is confirmed with a Pearson test: there is a moderate, positive, and linear relationship between perceived delegation and proactive self-efficacy (r=.59, p<.001, Pearson test).

The right side of Figure 11 presents the correlation between perceived delegation and proactive self-efficacy among managers. This scatterplot shows a strong, linear and positive relationship. A Pearson test confirms that there is a positive, linear and strong correlation between the two variables (r=.76, p<.001, Pearson test). Therefore, *H3* is confirmed.

We just saw that the more delegation one perceives from one's manager, the more likely one is to feel capable of being proactive. Thus, we also want to explore whether this relationship can be mediated by a proactive mindset.

Hypothesis: *H4: The relation between perceived delegation and proactive self-efficacy is mediated by a proactive mindset.*

Results: A proactive mindset mediates the relation between perceived delegation and proactive self-efficacy. *H4* is thus confirmed.

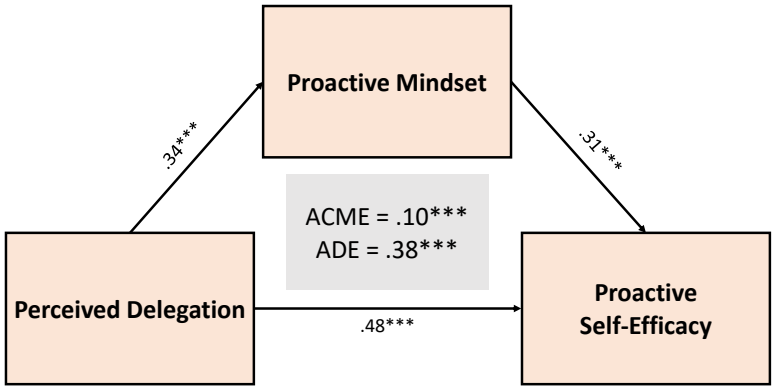
Support for results:

We mediated the effect of perceived delegation on proactive self-efficacy by the proactive

mindset. First, we regressed proactive self-efficacy on perceived delegation to confirm the latter is a significant predictor of proactive self-efficacy ($p<.001$, F test). Then, we regressed proactive mindset (i.e., the mediator) on perceived delegation to confirm that the perceived delegation is a significant predictor of the mediator ($p<.001$, F test). Finally, we regressed proactive self-efficacy on both proactive mindset and perceived delegation to confirm that proactive mindset is a significant predictor of the dependent variable.

The results are presented in Figure 12. ADE stands for average direct effects, which is the direct effect of perceived delegation on proactive self-efficacy after taking into account the indirect effect of a proactive mindset. ACME stands for average causal mediation effects, which is the total effect minus the direct effect of perceived delegation on proactive self-efficacy.

The ACME is significant; we found that 22,19% of the effect of perceived delegation on proactive self-efficacy is mediated by a proactive mindset ($p<.001$, Pearson test).



*p<.001 =***, p <.01 = **, p<.05 =**

Figure 12: Representation of the Mediation Analysis: Proactive Self-Efficacy is Affected by Perceived Delegation via a Proactive Mindset.

This analysis suggests that the delegation employees perceive from their management may increase their feeling that they can be proactive because they believe that proactivity is a quality that can be developed.

Proactive Mindset Among Subordinates						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	129	5.25	1.33	107	5.39	1.25
Treatment	177	5.31	1.43	150	5.44	1.27
Proactive Mindset Among Managers						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	10	5.67	0.99	9	5.74	1.28
Treatment	34	5.78	1.15	31	5.98	1.01

Table 21: Means and SD of Proactive Mindset Scores Before and After Treatment

Impact of the Interventions on a Proactive Mindset

In the previous sections, we examined the relationships between proactive and delegation mindsets and between proactivity and delegation. Both mindsets seem relevant to understanding proactive and delegation behaviors in the workplace. Is it possible to strengthen these mindsets? The next section will try to answer this question.

Hypothesis: *H1b: After the proactivity intervention, the growth mindset regarding proactivity will increase.*

Results: The proactive mindset scores slightly increase among subordinates and managers in both the control and the treatment condition. Difference-in-differences (DID) analyses do not reach significance. Therefore, *H1b* is not confirmed.

Support for results: To examine the impact of the interventions on a proactive mindset, we first look at the descriptive statistics. Results are presented in Table 21.

Among subordinates, in the control condition, the scores slightly increase after treatment. This is also the case for the treatment condition; the scores after treatment were slightly higher than those before it. Controlling for company seniority, as expected, the DID estimate did not reach significance (β=-.01, SD=.22, p>.05, F test). In other words, the interventions had no impact on the proactive mindsets of subordinates.

Scores were very similar among managers in the control condition In the treatment condition, the scores appeared to slightly increase after treatment from those before treatment.The DID estimator does not reach significance (β=.12, SD=.57, p>.05, F test).

The proactivity interventions have no impact on either subordinates' or managers' proactive mindsets. Thus, *H1b* is not confirmed.

After the treatment, no effect is observed on the belief that proactivity is a quality that can be developed at work. At this stage, it is still unclear whether the intervention had no impact on a proactive mindset or if the way we measure the mindset does not allow us to catch a potential evolution. Therefore, we next examine the intervention efficacy on proactive self-efficacy.

Impact of the Interventions on Proactive Self-Efficacy

Hypothesis: *H1c: After proactivity interventions, proactive self-efficacy will increase.*

Results: Scores of proactive self-efficacy slightly increase in treatment conditions, but analyses do not reach significance. Therefore, *H1c* is not confirmed.

Support for results:

Descriptive statistics are presented in Table 22.

Proactivity Self-Efficacy Among Subordinates						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	129	3.95	1.22	107	3.99	1.26
Treatment	177	4.15	1.31	150	4.28	1.33
Proactivity Self-Efficacy Among Managers						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	10	5.23	1.32	9	5.19	1.12
Treatment	34	5.38	1.15	31	5.63	1.22

Table 22: Means and SD of Proactivity Self-Efficacy Scores

For subordinates, scores were very similar before and after treatment in the control condition. In the treatment condition, scores appeared to slightly increase after treatment. If we control for company seniority, the DID estimate is not significant (β=.08, SD=.21, p>.05, F test). In other words, the interventions have no impact on the proactive self-efficacy of subordinates.

For managers, scores are very similar before and after treatment in the control condition. Among the treated, the scores seem to slightly increase from before treatment to after treatment. The DID estimate does not reach significance (β=.30, SD=.62, p>.05, F test).

The interventions have no impact on the proactive self-efficacy of either subordinates or managers. Therefore, *H1c* is not confirmed.

In other words, after treatment, employees do not feel more like they are capable of being proactive. This result suggests that the intervention has no impact on employees' proactive mindset and therefore on proactive self-efficacy. We next examine the impact of the second intervention, the one concerning delegation.

Impact of the Interventions on Delegation Mindset

The previous sections showed the congruence between a delegation mindset and delegation. Now, we examine the impact of mindset interventions on implicit theories regarding delegation.

Hypothesis: *H2b: After the interventions, the delegation mindset will increase among managers.*

Results: The delegation mindset scores slightly decrease after treatment, and analyses show that there is no effect. Therefore, *H2b* is not confirmed.

Support for results: We compare the mean scores of the delegation mindset before and after treatment in both conditions. They are presented in Table 23.

Conditions	Mean Before	SD	N	Mean After	SD	N
Control	6.03	0.82	10	6.21	0.50	8
Treatment	6.23	0.83	34	6.10	0.76	31

Table 23: Means and SD of Delegation Mindset Scores among Managers Before and After Treatment

In the control condition, the delegation mindset score seems to slightly increase after treatmentIn the treatment condition, the delegation mindset score seems to slightly decrease after treatment.

DID analysis showed no impact of the interventions on the delegation mindset (β=-.30, SD=.41, p>=.05, F test). Thus, *H2b* is not confirmed.

The interventions do not induce the belief among the treated managers that delegation is an ability that can be developed. However, can the interventions impact managers in ways that cannot be analyzed through mindset measures? Thus, we next explore the potential impact of the interventions on delegation.

Impact of the Interventions on Delegation

Hypothesis: *H2c: After the interventions, delegation self-efficacy and delegation behavior will increase among managers.*

Results: The scores of delegation self-efficacy slightly increase after treatment, and those of delegation behavior slightly increase in both conditions. Analyses show no significant effects. Therefore, *H2c* is not confirmed.

Support for results: Descriptive statistics of delegation self-efficacy and delegation are presented in Table 24.

Means and SD of Delegating Self-Efficacy Scores						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	10	5.97	0.81	8	5.83	0.56
Treatment	34	5.42	0.93	31	5.67	0.84
Means and SD of Delegation Scores						
Conditions	N	Mean Before	SD	N	Mean After	SD
Control	10	5.33	1.39	8	5.50	0.59
Treatment	34	5.23	1.03	31	5.35	1.01

Table 24: Means and SD of Delegating Self-Efficacy and Delegation Scores Before and After Treatment

The mean score of delegation self-efficacy slightly decreases after treatment in the control condition. In the treatment condition, the score after treatment seems to slightly increase over the score before treatment. These differences are very small, and the DID analysis shows no significance (βdid=.37, SD=.45, p=.4).

The scores of delegation seem to slightly increase after treatment in both the control condition and the treatment condition. These differences are very small, and the DID analysis shows no significance (β=-.03, SD=.55, p>.05, F test).

The interventions have no effect on either the sense of ability to delegate or the delegation behavior of the managers.

However, sometimes, people do not realize themselves that they have changed their behaviors, but others can tell. Therefore, we asked subordinates to evaluate their manager's delegation behaviors. Results are presented in Table 25.

Perceived Delegation by Subordinates						
Conditions	Mean Before	SD	N	Mean After	SD	N
Control	3.64	1.62	126	3.55	1.60	106
Treatment	3.72	1.46	177	3.88	1.45	149
Perceived Delegation by Managers						
Conditions	Mean Before	SD	N	Mean After	SD	N
Control	4.57	1.86	10	4.93	1.26	9
Treatment	5.13	1.42	34	5.27	1.35	31

Table 25: Means and SD of Scores for Perceived Delegation Before and After Treatment

Among subordinates, the scores of perceived delegation are quite similar in the control condition before and after treatment/Among the treatment condition, the score seem to slightly increase after treatment.When we control for company seniority, as expected, the DID estimator does not reach significance (β=.25, SD=.26, p>.05).

Regarding managers, and among the control conditions, the scores appear higher after treatment than before. This increase seems lower in the control condition. The DID analysis shows no significance (β=-.21, SD=.74, p>.05, F test).

Therefore, the interventions have no effect on the delegation perceived by the employees, and *H2c* is not confirmed.

4 Discussion

This field experiment aimed to examine for the first time the relationship between individuals' mindsets regarding proactivity and delegation and their workplace behaviors.

First, we found that a proactive mindset is positively correlated with proactive self-efficacy and positive attitudes. In other words, the more one believes that proactivity can be developed,

the more likely one is to think that proactive behaviors are good and to feel capable of being proactive.

Then, we found that a delegation mindset is correlated with delegation self-efficacy, reported delegation and positive attitudes toward delegation. That is, the more one believes that delegation can be developed, the more likely one is to feel capable of delegating, the more likely one is to delegate and the more likely one is to think that delegation is a good thing.

In addition, the results show that a proactive mindset mediates the positive relationship between perceived delegation and proactive self-efficacy. Stated differently, the positive relation between the perception that one's manager is delegating and the sense of being able to be proactive is partially explained by having a proactive mindset.

We also designed two mindset interventions to foster growth mindsets regarding proactivity and delegation. However, the interventions did not result in any significant change in the growth mindsets of participants. Indeed, after the interventions, their proactive mindsets did not increase, and therefore, their proactive self-efficacy did not increase either. Furthermore, the interventions had no impact on the delegation mindsets and thus on delegation self-efficacy and delegation behavior.

One possible explanation for the nonimpact of the interventions could be the materials we tested. In particular, the delegating intervention aimed to help managers realize that they need to delegate more to their subordinates by mobilizing the latter's key strengths. However, a very recent paper (Ding and Liu, 2022) led us to wonder whether the intervention we have implemented, is not, in reality, a strengths mindset intervention. Indeed, according to Ding and Liu (2022), a strengths mindset is the belief that strengths are the greatest factor of success, and therefore, individuals who hold a growth mindset are more likely to "appreciate, praise and learn from others' strengths" (p.3). However, this is one of the key messages of the interventions we designed. Thus, perhaps we delivered key strength interventions instead of delegation mindset interventions, which would explain the lack of efficacy of the interventions in fostering a delegation mindset. If this was indeed the case, and the interventions we delivered enhanced strengths mindsets, we could have observed increases in positive affect and task performance (Ding and Liu, 2022). However, we did not measure these outcomes, and thus, we cannot confirm these hypotheses.

In addition, the interventions we implemented may not have been sufficiently supportive of the idea that proactivity and delegation are malleable capacities. Indeed, in regular mindset interventions of intelligence, the key message is a vivid metaphor (i.e., the brain is like a muscle), and the participants are generally given scientific information that underpins this idea (e.g., a text or presentation about brain plasticity). Then, they usually have a saying-is-believing exercise to advocate this idea (e.g., write a text to explain to a younger student that intellectual abilities can be developed with time, effort and certain strategies). The two interventions we delivered did not follow the same path. That is, in the present study, participants watched popular science videos about the importance of proactivity and/or delegation depending on collaborators' key strengths. Then, the saying-is-believing exercise was not focused on the

malleability of proactivity and/or delegation. Instead, in the proactivity intervention, employees talked about what they should do to help everyone become more proactive. Furthermore, in the delegation intervention, managers were invited to share what they do to mobilize the key strengths of their subordinates. Therefore, it is possible that the implemented materials did not focus enough on the malleability of these qualities and, therefore, could not induce stronger growth mindsets regarding proactivity and delegation.

Another possible explanation could be a "blown effect". Specifically, mindset interventions are designed to produce a "snowball effect" - a virtuous circle in which adopting a growth mindset following an intervention leads to positive outcomes, such as the feeling that one's abilities are developing. This positive experience then reinforces the growth mindset. However, to generate the snowball effect, individuals' efforts need to be encouraged (Yeager and Walton, 2011). Therefore, it is possible that employees obtained a stronger proactive and/or delegation mindset after the intervention, but their environment did not support their proactivity and/or delegation, and the impact of the interventions therefore blew over as time progressed.

This field experiment presents several limitations. First, the samples were not randomized. Thus, we cannot conclude that the samples were similar before treatment, and the response rates even suggest that they were not. Indeed, subordinates in the treatment condition were significantly more likely than subordinates in the control condition to answer the questionnaires before as well as after treatment. In addition, subordinates in the treatment condition tended to be in the company for longer than subordinates in the control condition. However, scores before treatment were alike across conditions among subordinates and managers (except for a marginal effect of delegation self-efficacy among the managers).

We faced additional limitations in our study, as we lacked some information that would have allowed us to conduct supplementary analyses. For example, we were unable to match managers with their teams and conduct dyad analyses due to restrictions imposed by the company. Specifically, the company's management was concerned that union organizations may perceive this as a covert method of evaluating managers based on their team's performance, and therefore prohibited us from examining effects at the team level. In addition, one factor that may contribute to the observed correlations between proactivity mindset, proactivity self-efficacy, and positive attitudes towards proactivity is promotion focus. Individuals who prioritize promotion in their lives may be more likely to adopt a proactivity mindset, as being proactive can help them achieve their goals. This can result in increased self-efficacy regarding proactivity and a more positive attitude towards it as a key factor in attaining success. Therefore, measuring promotion focus would have been valuable in gaining a more comprehensive understanding of the associations between proactivity mindset, self-efficacy, and attitudes.

Another limitation is the manager sample size. Specifically, the control condition included eleven managers, and the treatment condition included thirty-five managers. In addition, all the managers did not respond to questionnaires. However, exploratory analyses were conducted with both the control and treated groups of managers in order to maximize data. Moreover, for the analyses of proactive mindset, proactive self-efficacy, and perceived delegation, tests were

run for both subordinates and managers.

The lack of placebo intervention could be seen as a limitation. However, given that employees are actively working and usually participate in various workshops and trainings, a business-as-usual control might be sufficient to avoid the Hawthorne effect.

This field experiment underlines the relevance of studying implicit theories of delegation and proactive mindsets to understand proactivity and delegation in organizations. Moreover, this literature seems to be growing. A very recent study has also highlighted the relevance of a proactive mindset (Benson-Greenwald and Diekman, 2021). In their paper, the authors call a proactive mindset the perception of having the ability to change one's environment, although this definition that does not take into account the fixed or malleable components of the definition of proactive mindset we propose here. However, their paper showed that the more proactive students are, the more likely they are to believe that they will fulfill their career goals, and this belief is in turn associated with positivity regarding relevant career pathways. Therefore, taking an interest in proactive mindsets might be relevant for organizations, but may also be of interest to colleges or even high schools.

Future work could explore the degree to which the environment is supportive or unsupportive of proactive and delegation mindsets as well as examine proactivity and delegation to determine whether the snowball effect is preventable. In addition, it could include more objective measures of delegation and proactivity in natural settings.

Even more importantly, future work could explore the possibility of inducing growth mindsets regarding proactivity and delegation in more controlled trials. Indeed, this paper highlights the relevance of these mindsets in the workplace for understanding proactivity and delegation, two abilities commonly encouraged in organizations. At this stage, we do not know whether our materials were poorly calibrated or whether these growth mindsets cannot be induced at all. Therefore, proactive and delegating interventions could be tested in a more controlled environment in future research.

5 Supplementary Materials

Measures

Scales for all the employees

- Proactive mindset (adapted from Blackwell et al., 2007, α=.82[14], α=.78[15])
  - Peu importe qui on est, on peut toujours développer sa capacité à prendre des initiatives.
  - En progressant dans son métier, on devient capable de prendre davantage d'initiatives.
  - Même si on prend peu d'initiatives au départ, on peut développer son autonomie.
- Proactivity self-efficacy (adapted from Bandura, 2006, α=.73, α=.84)
  - Je me sens capable d'essayer des choses nouvelles dans mon travail.
  - Je prends souvent des initiatives, dans mon travail.
  - J'ai la possibilité de prendre des initiatives dans mon travail.
- Perceived delegation (adapted from Schriesheim et al., 1998 α=.86, α=.93)
  - Mon (ma) manager me laisse prendre certaines décisions dans que j'aie à lui demander son accord.
  - Mon (ma) manager me laisse prendre moi-même des décisions sans que j'aie à le (la) consulter.
  - Mon (ma) manager me donne souvent un avis sur un dossier, tout en me laissant ensuite prendre ma propre décision.
- Attitude toward proactivity (α=.85, α=.87)
  - Je pense que c'est important de prendre des initiatives au travail.
  - Je suis d'avis qu'il faut essayer de nouvelles façons de faire, au travail.
  - Prendre des initiatives, cela contribue à rendre le travail intéressant.
- Attitude toward delegation (α=.79, α=.85)
  - Je pense que c'est important que mon (ma) manager m'accorde un pouvoir de décision sur certains sujets.
  - En entreprise, je suis d'avis qu'il faut donner beaucoup d'autonomie aux gens.
  - Disposer d'une réelle autonomie, je pense que c'est bénéfique.

[14] Among subordinates
[15] Among managers

Additional scales for managers

- Delegating mindset (adapted from Blackwell et al., 2007, α=.74)
  - Tout manager peut apprendre à faire davantage confiance à ses collaborateurs.
  - Quand on progresse en tant que manager, on délègue davantage.
  - Même si on contrôle beaucoup au départ, on peut développer sa capacité à déléguer.
- Delegating self-efficacy (adapted from Bandura, 2006, α=.85)
  - Je me sens capable de donner beaucoup d'autonomie à mes collaborateurs.
  - Je sais m'y prendre pour confier un pouvoir de décision à des collaborateurs.
  - Je réussis bien à développer l'autonomie de mes collaborateurs.
- Attitude toward delegating (α=.84)
  - C'est important d'accorder un pouvoir de décision à mes collaborateurs, sur certains sujets.
  - En entreprise, je suis d'avis qu'il faut donner beaucoup d'autonomie aux gens.
  - Disposer d'une réelle autonomie, je pense que c'est bénéfique.
- Delegation (adapted from Schriesheim et al., 1998, α=.84)
  - Souvent, mes collaborateurs n'ont pas à me demander mon accord avant de prendre une décision.
  - Je laisse mes collaborateurs prendre certaines décisions sans me consulter.
  - Je donne souvent à mes collaborateurs mon avis sur un dossier, puis je les laisse prendre leurs propres décisions.

Details Intervention Protocols

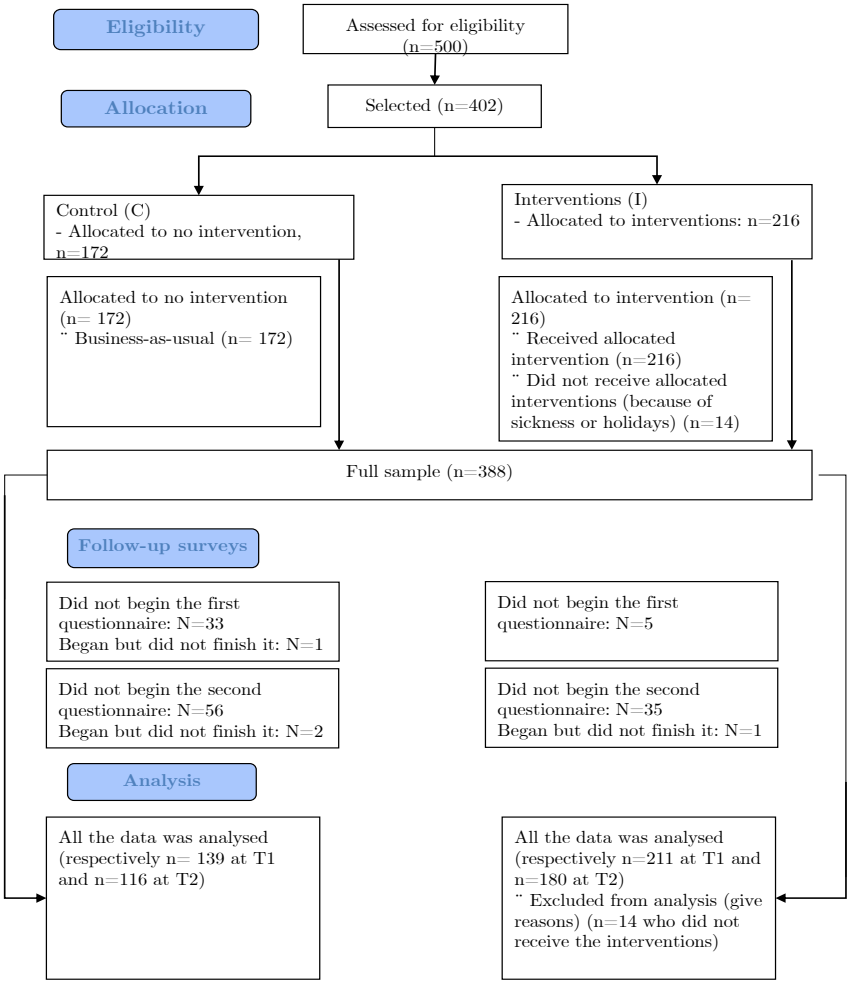
Proactivity Intervention Protocol	
Sequences	**Activities**
Introduction and trust-building exercises	Introduction of the participants: "My name is ... Among the things that I really like about my job, there are..."
Creating an expectation : Why do I want to be more proactive?	"In any given workday, there are situations where one must follow the planned process, and others where there are several possible ways to proceed. In your case, is the usual distribution more towards...[90%-10%; 10%-90%,50%-50%]" "Recently, I encountered a situation where there were multiple possible ways of doing things, and it was when..." "Given this situation, what did you do?" "According to your experience, taking initiative is particularly satisfying when..." "Being able to take more initiatives would allow you to..." "In one word, when I take an initiative and it works, I feel..."
Diving into a story to ease the message delivery	Introduction of the thriller miniseries called "Call For Action" and presentation of its teaser (1'10). Written, produced and directed with an international team, Call For Action is a Netflix-standard thriller series created by Korda & Company. The concept: Dorian Bonham is in charge of the secret operations of a defense agency affiliated with the UN. In the event of a mission failure, he has access to technology that sends him back in time and offers him a second chance to change the course of history. Call For Action, episodes 1 (1'51), 2 (3'20) and 3 (3'19). After each episode, a quick debriefing through a game: participants are split in two teams and they confront each other in a ping-pong of ideas (i.e., "What Dorian wanted to do..." and "Instead of Dorian, we would have tried to...").
Encouraging a growth mindset	In the miniseries, one of the main characters said, "You have to think before you act Dorian". Presentation of a popular science video: "Taking action power" (4'27). Facing the camera, an expert (i.e., the president of the experimenter's company) talks about proactivity. The key message was that the happiest people are those who focus their energy on what they can change. Participants briefly share what they found interesting in the video. "Saying is believing" exercises: Participants share what subordinates and managers could do to make everyone more proactive. Then, in pairs, each person asks to the other: "And you, what could you do to take more control?"
Taking action	"What will you do with all this? During this workshop, you were able to step back and reflect on your work and some of your aspirations. Perhaps this workshop has further strengthened your desire to learn? The method you are about to discover can help you take action." Presentation of the WOOP motion design video (3') to help people establish new behaviors. This method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., ``If..., then, I will...").
Conclusion	Finishing the story: "Instead of Dorian and in this type of situation, what you would prioritize doing is..." Call For Action fourth and final episode (3'55). Round table: "One important idea I leave with is..."

Delegation Intervention Protocol	
Sequences	**Activities**
Introduction and trust-building exercises	Introduction of the participants: “My name is ... And a few people here knows about me that...”
Creating an expectation : Why do I want to delegate more?	“"Making the team excellent" is primarily important for you because... [it’s my duty; it’s my pleasure; it’s a need]” “For you, as a manager, the most satisfying thing is when you succeed in...”
Encouraging a growth mindset of delegation	Presentation of a first popular science video: ``How to make a team excellent?" (6’57). Facing the camera, an expert (i.e., the president of the experimenter’s company) talks about power and status. The main messages conveyed in this video pertain to power and status dynamics. Drawing on the insights of Keltner (2017), the speaker highlights that bestowing power upon an individual can enhance their focus, persistence, and creativity. However, when a person with a lower status (referring to the level of admiration they command) is given power over us, we tend to resist. The video goes on to explain how employees who make the most suggestions often face lower promotion rates and pay increases, as managers unconsciously penalize subordinates with lower status who seek to assert their power. Consequently, subordinates become disinclined to take proactive measures. Participants briefly share what they found interesting in the video. “Saying-is-believing” exercise: in pairs, they share about a situation in which they boosted the confidence and autonomy of one of their subordinates.
Diving into a story to ease the message delivery	Introduction of the thriller miniseries called “Call For Action” and presentation of its teaser (1’10). Written, produced and directed with an international team, Call For Action is a Netflix-standard thriller series created by Korda & Company. The concept: Dorian Bonham is in charge of the secret operations of a defense agency affiliated with the UN. In the event of a mission failure, he has access to technology that sends him back in time and offers him a second chance to change the course of history. Call For Action, episodes 1 (1’11), 2 (2’18) and 3 (3’04). After each episode, a quick debriefing through a game: participants are split in two teams and they confront each other in a ping-pong of ideas (i.e., “What Dorian should not have...” and “Instead of Dorian, we would have tried to...”).

Encouraging strength-based management	In the miniseries, one of the main characters said, ``You have to find the best in people, Dorian".  Saying-is-believing exercises: “It's important to 'find the best in people.' The last time you noticed this was..”  Presentation of a popular science video: ``Developing key strength" (5’10). Facing the camera, an expert (i.e., the president of the experimenter’s company) talks about key strengths. Based on a survey led by the Gallup Organization (i.e., an American analytics and advisory company known for its public opinion polls conducted worldwide), the speaker explains that organizations in which employees use their key strengths on a daily basis (i.e., employees do what they do best at work every day) are characterized by the highest level of performance and well-being. Moreover, when companies focus on key strengths (vs. weak points) of their employees, they see significant improvements in economic performance and even a drastic decrease in industrial accidents. Therefore, managers should identify the main strengths of their subordinates and then assign tasks to them accordingly. Participants briefly share what they found interesting in the video. “Saying is believing” exercise: “Mobilizing the strengths of your subordinates is something you mainly do in order to...”
Taking action	“What will you do with all this? During this workshop, you were able to step back and reflect on your work and some of your aspirations. Perhaps this workshop has further strengthened your desire to learn? The method you are about to discover can help you take action.” Presentation of the WOOP motion design video (3’) to help people establish new behaviors. This method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., ``If..., then, I will...").
Conclusion	Finishing the story: “What do you think Dorian should do during his Reboot?” Call For Action fourth and final episode (4’42). Round table: “One important idea I leave with is...”

Attrition

CONSORT diagram: reasons for attrition



Complementary analyses

Trainer effects

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.5082	0.4073	3.70	0.0003
Proact. Self-Eff T1	0.6656	0.0974	6.83	0.0000
Trainer	-0.4963	0.5400	-0.92	0.3596
Proact. Self-Eff T1*Trainer	0.0993	0.1263	0.79	0.4330

Table 26: Trainer effect on the proactive self-efficacy after treatment

Trainers had no effect on proactive self-efficacy (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.2462	1.2282	1.83	0.0695
Proactive Mindset T1	0.6257	0.2214	2.83	0.0054
Trainer	0.6159	0.7427	0.83	0.4084
Proactive Mindset T1*Trainer	-0.1354	0.1337	-1.01	0.3128

Table 27: Trainer effect on the proactive mindset after treatment

Trainers had no effect on proactive mindset (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	3.6667	1.4303	2.56	0.0114
Attitude toward Proact. T1	0.3974	0.2357	1.69	0.0940
Trainer	-0.6439	0.8633	-0.75	0.4570
Attitude toward Proact. T1*Trainer	0.0930	0.1429	0.65	0.5161

Table 28: Trainer effect on attitude towards proactivity after treatment

Trainers had no effect on attitude toward proactivity (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.9014	0.8660	2.20	0.0298
Perceived delegation T1	0.5086	0.2250	2.26	0.0253
Trainer	-0.3367	0.5254	-0.64	0.5226
Perceived delegation T1*Trainer	0.0961	0.1339	0.72	0.4741

Table 29: Trainer effect on perceived delegation after treatment

Trainers had no effect on perceived delegation (p>.05, t test).

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	3.7391	1.3320	2.81	0.0057
Attitude toward delegation T1	0.3611	0.2336	1.55	0.1244
Trainer	-0.9627	0.8499	-1.13	0.2593
Attitude toward delegation T1*Trainer	0.1506	0.1497	1.01	0.3163

Table 30: Trainer effect on attitude towards delegation after treatment

Trainers had no effect on attitude toward delegation (p>.05, t test).

Chapter 3: The Impact of a Growth Mindset on Job Seekers' Willingness to Learn: Can Mindset Interventions Be Effective?

1 General Introduction

According to the International labor organization (2020), 470 million individuals throughout the world are affected by unemployment, among which 75 million people under 18 are not in employment, education or training (NEETs). Unemployed individuals often face multiple barriers to accessing the labor market, including health problems, but inadequate job skills and education are also significant factors. In fact, there is a positive relationship between job skills and employment outcomes. For instance, between 33 and 64% of all welfare recipients have very low basic skills and/or education, whereas there is a positive correlation between years of education and exits from welfare (Blumenberg, 2002). Hence, various training programs have been developed to provide unemployed persons with the skills needed to find a job.

The present chapter is divided into two parts. The first part examines training programs that have been rigorously tested over the last three decades to boost reemployment among unemployed persons. What do these programs consist of? How effective are they exactly? Moreover, as mindset theory is a determinant of how people approach learning, do some of the training programs include mindset interventions to increase an unemployed person's appetence for learning and propensity to persevere in the face of setbacks? This literature review also seeks to identify whether mindset interventions are included in the existing training programs that aim to increase reemployment.

In the latter section of this chapter, a pilot study is introduced that outlines the development

of a short mindset intervention aimed at improving the readiness of unemployed individuals to learn. The study aims to increase their engagement in training programs and subsequently enhance their chances of achieving success in reemployment.

2 Literature Review

2.1 Introduction

(Un)employment is a modern issue that will likely be here for some time to come (MacDonald, 2011); it has negative impacts on mental health (World health organisation, 2011), psychological and physical well-being (McKee-Ryan et al., 2005), and other diverse psychological and social dimensions, such anxiety, depression or lower self-esteem (Åslund et al., 2014).

To tackle unemployment among youth and adults and to prevent the abovementioned issues, public policies and nonprofit organizations can propose training programs for job seekers to become proficient. In France, for instance, the government has embarked on a competencies investment plan to support structural reforms with the aim of providing training and supporting the integration of more than two million underskilled people, including refugees and immigrants, into the workforce and thus to ensure their inclusion in society (Ministère du travail, 2020).

A previous meta-analysis has shown the impact of some of these programs on reemployment. Indeed, Card et al. (2010) analyzed 199 estimated effects of active labor market policies (ALMPs). More specifically, they examined classroom or on-the-job training, job search assistance programs and subsidized private and public sector employment. First, they found differences in program efficacy when comparing short- and long-term effects. Specifically, most programs showed insignificant effects after one year but yielded positive impacts after two or three years (a phenomenon also known as the lock-in effect). In addition, some programs are more likely to be successful than others. For instance, subsidized public sector jobs programs show generally less favorable impacts than the other ALMPs. Thus, this meta-analysis highlighted the positive impacts of most ALMPs on reemployment (sometimes after an initial lock-in effect).

However, this meta-analysis used only ALMPs. These policies form government programs that intervene in the labor market to help unemployed people find work across Organization for Economic Cooperation and Development (OECD) countries. Thus, most ALMPs are promarket and employment oriented (Bonoli, 2010). Specifically, ALMPs aim to improve the labor market prospects of unemployed individuals by upgrading their skills. However, other types of training may exist that focus on human capital rather than market labor. Thus, the effectiveness of these other types of training is still unclear. In addition, according to another meta-analysis conducted by Mawn et al. (2017), most of the tested interventions and programs are not reported in detail (e.g., length, precise content) and provide little reliable information about the kind of training proposed and its real effectiveness. This is a major issue, as access to this information is crucial to understanding the impact of the different types of interventions.

In addition, Card et al. (2010) also found that the outcome criteria used when evaluating ALMPs differed significantly. Indeed, evaluations that measure outcomes based on time spent in registered unemployment are more likely to show favorable results than evaluations based on employment or earnings. However, the outcome criteria used for the evaluation of other types of training are still unclear.

Additionally, since mindset theory suggests that individuals' approaches to learning are influenced by their beliefs about intelligence and abilities, it raises the question of whether any of the training programs incorporate mindset interventions aimed at enhancing the motivation to learn and resilience in the face of obstacles among unemployed individuals.

Based on the work of Card et al. (2010), we wanted to examine all kinds of training (i.e., ALMPs and others) tested with job seekers. More specifically, we aimed to answer four main questions: 1) What are the expected outcomes that are examined by the training programs analyzed in this review? 2) How successful are these programs in achieving their expected outcomes? 3) What are the primary types of training programs available to job seekers, and do they include interventions targeting mindset? 4) Which types of training programs are more effective in remobilizing people to gain reemployment and which are less effective? To answer these questions, we conducted a literature review, focusing specifically on scientific articles that report on proposed programs and interventions to aid unemployed individuals and NEETs in the last thirty years.

2.2 Method

Literature search

We conducted a literature search using a university hosting database (UHD). This database relies on EBSCO Host services, which provide access to several databases. Among the databases, the following were consulted: DOAJ - Directory of Open Access Journals, Scopus (Elsevier), OneFile (GALE), ProQuest Central, Social Science Premium Collection, MEDLINE/PubMed, Health Reference Center Academic (Gale), Informa - Taylor & Francis (CrossRef), Elsevier (CrossRef), ScienceDirect (Elsevier), ERIC, JSTOR Archival Journals, Wiley (CrossRef), Wiley Online Library, ECONIS (ZBW), SwePub, PubMed Central, and NARCIS.

We searched for articles in English and French from January 1990 through March 2020 (included). Looking for the search terms (NEET OR "sans-travail" OR chômeur OR "demandeur d'emploi" OR unemployed OR jobless OR underemployed OR unoccupied) AND (training OR entraînement OR formation OR intervention OR accompagnement OR dispositif OR instruction OR coaching OR teaching OR formation OR program) within the title yielded 935 results, though this included some duplicates. UHD yielded a sorted list of 324 articles that was imported into Mendeley Desktop software, version 1.19.42 © (2008, Glyph & Cog, LLC.) to merge the duplicates. This resulted in 285 articles.

Inclusion and Exclusion Criteria

As there are numerous training programs around the world, we decided to focus only on those accompanied by published scientific evidence, excluding gray literature. Articles were included if they (1) presented an experimental or quasiexperimental study and (2) presented a quantitative evaluation of intervention[16]. We ultimately selected 78 articles.

Quality Assessment/Coding

A coding scheme was developed on the basis of Cochrane collaboration standards (Higgins and Green, 2011). As we wanted to focus on experimental and quasiexperimental studies testing interventions, we assigned scores of 1 if the abstract presented secondary aspects related to the analysis of practices or methods (N=46), 2 if it presented an analysis of practices or methods (N=15), and 3 if it presented a detailed analysis (N=17). Studies scored as 1 were excluded, as were three other articles that were not available online, leaving us with 29 articles.

Data Extraction

We extracted the following data from the 29 articles: name of the authors, year of publication, journal of publication, design of the study, country, type of intervention, length of the intervention, number of participants, target population, variables, instruments of measurement, main findings, sample size if complete reported data, discussion, and limitations.

Statistical Analysis

We used SPSS Statistics software version 23 (1989, 2015 IBM Corporation) to perform effect size analyses. For studies that reported mean scores of post-intervention for both control and experimental groups, or pre-post intervention scores for the experimental group, we calculated effect sizes (N=5)[17]. For articles measuring employment outcomes and not reporting descriptive statistics, we attempted to calculate effect sizes from regression coefficients. However, among the 14 papers concerned, 6 did not report coefficients (they were usually presented only in table form), 6 did not report sample sizes, and 2 did not report standard deviations. Only one paper provided all the necessary data, so we were able to include it in our effect size calculations, resulting in six articles being used. We considered P values to be two-sided, and a P value of less than .05 was considered statistically significant.

2.3 Results

In this section, we analyze the 29 articles included in this literature review. It is worth noting that references, interventions and their brief descriptions, and targeted outcomes are all presented in Supplementary Materials 3.5. To answer the four research questions (i.e., the expected outcomes proposed by the training, their success regarding them, the type of training proposed and the effectiveness of the different types of training), we first developed an overview of these

[16]Qualitative evaluations were excluded.
[17]Most of the 29 articles included in this literature review did not report descriptive statistics.

papers, describing their publication years, the countries in which the studies were carried out, their sample sizes, the mean ages of the participants, the instruments used and the duration of the interventions. Then, we tried to answer our research questions using the collected data. First, we inspected the expected outcomes of each article. Next, we examined the significance of these outcomes. After that, we analyzed the programs that were tested and tried to identify the most effective programs. Finally, the results were discussed.

Descriptive analysis

We found eleven experimental studies, three quasiexperimental studies and fifteen studies using secondary data (i.e., using preexisting data). Most of them were conducted in the last decade (N=15), nine between 2000 and 2009, and only five between 1990 and 1999. Most studies were carried out in Europe (63.3%), while 10 were conducted outside Europe. We found three studies with a small sample size (10-99), seven with a medium sample size (100-300) and sixteen with a large sample size (+300). Three articles did not mention any sample size. The secondary data or record data studies accounted for 93.7% of the large samples. The mean participant age was 37.28 years old (SD=8.84), ranging from 20.67 to 50.91. Seven studies did not indicate the mean age of the participants. The instruments used were standardized and nonstandardized questionnaires and estimations. The length of the programs varied, with six brief interventions that lasted less than a week, eight medium-term interventions that lasted between one week and three months and nine long interventions that lasted longer than three months. Six papers did not mention the duration of the interventions. The number of hours spent participating in the intervention was not always reported, making it impossible to establish the exact duration of the programs.

Expected Outcomes

We present a mapping of all the expected outcomes in Figure 13.

Thirty-seven variables to measure psychological outcomes, fourteen variables to measure technical outcomes and forty-five variables to measure employment outcomes were identified. Among psychological outcomes, the most frequently studied were self-confidence/self-esteem/self-efficacy, psychological states of mind (e.g., affects, depression) and life satisfaction. Among technical outcomes (e.g., seeking resources, decision-making, locus of control), there was no variable that was measured in more than one study. To measure the impact on employment, variables were grouped into three main outcomes: direct employment (e.g., employment rate), quality of employment (i.e., earnings and stability), and re-engagement and independence indices (i.e., autonomy from governmental aid and enrollment in the educational system). Twenty-five variables were related to direct employment. Among them, twenty-two variables measured reemployment and job finding, and three measured (un)employment duration. In addition, fourteen variables measured quality of employment through level of earnings of the secured job and job stability. Finally, one variable was related to re-engagement in the educational system, one was about

Psychological Outcomes

Job interview self-confidence*
Negative thinking
Levels of depression*
Helplessness*
Psychological distress*
Life satisfaction*
Self-esteem*
Self-esteem employment
Employment-specific depression
Guilt
Anger
Social support
Employment value
Employment expectations*
Self-esteem*
Job-search self-efficacy*
Self-condence in a job search*
Entrepreneurial self-efficacy*
Positive affect
Negative affect*
Fatigue severity
Motivation*
Psychological capital*
Job-search self-effcacy
Job search intentions*
Intention to find a job*
Self-esteem*
Job-seeking self-efficacy*
Mental strain*
Attributional style*
Motivation for work*
Life satisfaction*
Job-search self-efficacy*
Self-esteem*
Psychological distress*
Depressive symptoms
Job satisfaction

Technical Outcomes

Job interview performance*
Decision-making
Use of professionals/agencies
Entrepreneurial intention
Seeking resources*
Seeking challenges*
Reducing demands
Career exploration*
Networking intensity*
Networking quality*
Learning from failure*
Strategy awareness*
Job-search goal orientation*
Locus of control*

Employment Outcomes

Direct Employment

Employment probability*
Expected duration of unemployment
Job-finding probability
Employment*
Current employment status
Exit rate from unemployment
Unemployment recurrence
Exit unemployment*
Employment rate*
Employment rate*
Unemployment duration*
Job-finding*
Employability*
Reemployment success*
Job search
Job search*
Employment rate*
Reemployment status
Reemployment status*
Employment probabilities*
Fraction of time spent unemployed*(-)
Probability of reemployment*(-)
Working 30+ hours in 30 months*
Reemployment
Integration into labor market*

Quality of Employment

Quality of employment*
Employment commitment
Changes in employment status
Earnings
Stability of the job*
Financial situation
Earnings*
Earnings*
Wages
Level of earnings*
Number of employers*
Number of job changes*
Job stability*
Wage rate

Re-engagement and Independent Indices

Exit from public welfare dependence*
Benefit recipiency rate
Probability of being not in employment, education, or training (NEET).*
Probability of participation in the regular educational system*(-)

Figure 13: Mapping of Targeted Outcomes in Each Article into Categories: Psychological, Technical, and Employment Outcomes

Significant outcomes are marked with.*

engaging in education or in working and two measured dependence on social aid.

Significance of the Outcomes

All the significant outcomes appears in Figure 13. Regarding the significance of the results, 12 out of 13 studies (92.3%) that expected significant results for psychological outcomes achieved such results for at least one of the outcomes; four out of six (66.6%) reported significant results on at least one of the expected technical outcomes; and twenty out of twenty-three papers (86.9%) reported significant results for at least one employment outcome. More precisely, seventeen out of twenty-one (80.9%) articles reported significant results on at least one expected direct employment outcome, and eight out of ten articles measuring the quality of employment reported significance (80%). In addition, Rotar (2018) analyzed the probability of participation in the regular educational system with a significant but negative impact, and Park et al. (2020) had significant results on the exit of the NEET status. Finally, of the two papers that examined independence from social aids, only one reported significant results (Fitzenberger and Völter, 2007).

Effect sizes were calculated through Cohen's delta (Cohen, 1992) for the posttest scores of variables that reported significant results. Scores presented a mean small effect size (d=0.40) ranging from a small effect (d=0.07) to a large effect (d=5.73). The mean effect size for psychological outcomes was d=0.41, that for technical outcomes was d=0.64, and that for employment outcomes was d=2.32.

Tested Training Programs

The training programs among the studies are diverse; thus, defining detailed categorizations for training types was not possible.

To begin, it is worth noting that certain studies presented a hierarchy of interventions in terms of their effectiveness in aiding employment (e.g., Cockx et al., 2020). Additionally, some studies demonstrated significance only in the short term (Nivorozhkin and Nivorozhkin, 2007), while others showed significance only after a lock-in effect, which is a period of time (Hodzic et al., 2015).

Prior meta-analyses (e.g., Card et al., 2010) have focused on examining the effectiveness of active labor market policies (ALMPs), which refer to government-funded programs aimed at promoting employment and reducing unemployment by improving job matching, providing training, and offering direct job creation measures. However, in our current literature review, we aimed to explore various job seeker training programs, including both ALMPs and other interventions, and categorized and differentiated these interventions. Thus, we draw an overview of the interventions in Figure 14. It must be noted that most of the interventions tested are ALMPs. Indeed, among the 29 articles this literature review included, at least 21 can be considered as ALMPs. Some are specifically described as ALMPs, while others are labeled as

ALMPs

- Training programs, job search counseling and support (Blázquez et al., 2019).*
- Coaching and counseling (Boockmann & Brändle, 2019).*
- Short-term vocational training, longer-term vocational training and orientation training (Cockx, Lechner and Bollens, 2019).*
- Occupational skills/personal development training courses (Creed et al., 1998).*
- Occupational skills training (Creed et al., 2001).*
- Public-sponsored training programs (Crépon, Ferracci and Fougère, 2012).*
- Employment training (i.e., training and job placements) and employment action (i.e., work experience; Firth, Payne and Payne, 1999).*
- Specific professional skill and technique training, working in a practice, and retraining (Fitzenberger et al., 2008).*
- Specific professional skills and techniques, working in practice rm and retraining (Fitzenberger & Völter, 2007).*
- Mandatory job search programs, intensive counseling and mandatory training programs (Graversen & van Ours, 2008).*
- Employability skills training program (Hillman & Knill, 2018).*
- General vocational training courses (Hirshleifer et al, 2016).*
- Training programs (Lechner et al., 2007).*
- Vocational training programs (Nivorozhkin & Nivorozhkin, 2007).
- Public training programs (Rinne, Schneider and Uhlendorff, 2011).*
- Competence enhancing training (Rosholm & Skipper, 2009). (-)*
- Work-first type of programs (Rotar, 2019). (-)*
- General and specific skills training (Stenberg & Westerlund, 2015).*
- Job-search skill enhancement program (Vinokur et al., 1997).*
- Job-search skill enhancement program (Vinokur et al., 1991). *
- Job search program (Vuori et al., 2002).*

Other Type of Interventions

- Job interview simulation : computer-based training simulation created to improve job interview skills (Aysina et al., 2016).*
- Cognitive information processing approach: presentation of the CASVE cycle (Communication, Analysis, Synthesis, Valuing, and Execution) to help in making informed career choices by exploring an individual's values, interests, and skills (Bullock-Yowell et al., 2014).
- Guarantee for early program participation: guarantee the assignment to a program within 100 days (Carling & Larsson, 2005).
- Emotional competencies intervention: The goal of the intervention was to enhance emotional competencies and cultivate efficient emotion regulation strategies (Hodzic et al., 2015).*
- Job search demands-resources intervention: The training program aims to incorporate reemployment crafting and PsyCap into job search routines, providing individuals with new behavioral techniques that can be utilized to improve their well-being and job search behavior (Hulshof et al., 2019).*
- Learning-goal orientation training on self-regulation: The goal is to enhance job seekers' situational LGO, which in turn can improve self-regulation during job search and ultimately enhance their chances of reemployment success (Noordzij et al., 2013).*
- Youth employment support program: The program offers support services to youth at the individual level, including vocational education, psychological services, and emotional support. Additionally, it extends to families by providing coaching and training to improve parenting skills and extends to the community level (Park et al., 2020).*
- Cognitive-behavioral training on job-finding: Training aims to identify and modify attributional styles (Proudfoot et al., 1997).*

Figure 14: Overview of Interventions: Active Labor Market Policies and Other Interventions
*Interventions which reported significant results are marked with**.

vocational training, orientation training, occupational skills training, public-sponsored training programs, employability skills training programs, and job-search programs. The literature review identified eight interventions that were not categorized as ALMPs: job interview simulation, cognitive information processing approach, cognitive-behavioral training, youth employment support, emotional competencies interventions, reemployment crafting, and learning-goal orientation training. These interventions aimed to enhance various skills and behaviors such as interview skills, career decision-making, emotional intelligence, and learning-goal orientation. Although they do not fall under the category of ALMPs, these interventions have demonstrated promising potential to achieve their intended outcomes.

The effectiveness of active labor market programs (ALMPs) was assessed in 21 studies, with the majority (18 studies) reporting positive significant results. This suggests that ALMPs are effective in improving their targeted outcomes. However, one study did not report any significant results (i.e., vocational training programs tested by Nivorozhkin and Nivorozhkin, 2007) and two studies reported negative significant results (i.e., competence enhancing training tested by Rosholm and Skipper; 2009; and work-first type of programs tested by Rotar, 2018), suggesting that some ALMPs may not be effective in improving their targeted outcomes.

Regarding other interventions tested (N=8), a majority of studies (N=6) reported significant positive results, indicating their effectiveness in improving their targeted outcomes. However, two studies did not report any significant results (i.e., a cognitive information processing approach tested by Bullock-Yowell et al., 2014, and a guarantee for early program participation tested by Carling and Larsson, 2005), suggesting that these interventions may not be effective in improving employment outcomes.

Moreover, a total of 17 papers reported significant results in all expected outcome measures[18], indicating the potential effectiveness of diverse interventions. The reported interventions included active labor market programs (N=14), cognitive-behavioral training on job-finding, job interview simulation, and youth employment support programs. This suggests that diverse interventions have the potential to be effective in improving various outcomes related to employment.

All the interventions required job seekers to attend multiple group sessions. Indeed, when details are reported, sessions were delivered to groups of five to eighteen participants (e.g., Hodzic et al., 2015; Proudfoot et al., 1997; Vuori et al., 2002; Noordzij et al., 2013), and each intervention consisted of several sessions. The interventions tested by Noordzij et al. (2013) comprised two meetings of three hours each, those designed by Vinokur et al. (1991) comprised eight sessions of three hours each, and those of Proudfoot et al. (1997) comprised one three-hour session every week for seven weeks. The intervention examined by Hodzic et al. (2015) lasted two and a half days, and that examined by Vuori et al. (2002) took place over one week. The interventions tested by Park et al. (2020) lasted, on average, 21.5 months.

[18]Five of them measured only one main outcome

Training Effectiveness Regarding Reemployment

All the interventions that targeted employment outcomes are presented in Table 31.

Among the interventions that achieved their targeted employment outcomes, twelve were ALMPs and two were other type of interventions. Among the ALMPs, seven were skill training programs, including vocational, employment, and retraining programs. These interventions typically had a relatively long duration, although information on the duration of two studies was not reported. Additionally, the study included three job-search training programs, consisting of two brief interventions and one mid-length program. Furthermore, one program was a brief counseling. Additionally, one program was a combination of training, counseling, and job-search and lasted less than three months. Among the other interventions, one was a brief learning-goal orientation program and one program was a combination of training, emotional support, and psychological services, for which duration information was not reported.

On the other hand, among the interventions that did not reach statistical significance in terms of their employment outcomes, most of them were ALMPs: three were working in practice firms and were long in duration. Additionally, three were training programs, including orientation training, retraining, and vocational training programs, and were also long in duration, no information reported for one of them. The last ALMP that did not show significance was a mid-length combination of occupational skills training and personal development training. One other intervention that was insignificant was the guarantee of program assignment within a hundred days. Finally, the two interventions that showed negative and significant results were a mid-length training program, and a placement into a work environment, with no duration reported.

Furthermore, there were six interventions that presented mixed evidence, as they achieved some employment outcomes, but not others. Four of them were ALMPs, among which there were three training programs (i.e., no duration information was reported for three of them, the fourth was long); and one was a job-search program. Two other interventions presented mixed evidence and were brief interventions based on emotion regulation, namely emotion regulation training and PsyCap (Psychological Capital) and reemployment crafting. The first intervention improved employability and reemployment success, but did not have an impact on job-search outcomes. The second intervention, on the other hand, improved job-search outcomes, but did not affect the financial situation of the participants.

Ultimately, our research question was whether interventions available to job seekers targeted mindset. While none of the interventions analyzed were explicitly labeled as mindset interventions, the orientation-goal intervention (Noordzij et al., 2013) could be construed as relevant to mindset theory. The orientation-goal intervention aims to strengthen job seekers' situational learning goal orientation to improve their self-regulation in job search and enhance their reemployment success. Learning goal theory suggests that individuals generally have either a learning or performance goal orientation (Dweck and Leggett, 1988). The learning goal orientation is associated with developing competences and mastering things, whereas performance goals are

Studies	*Type of Intervention*	*Length* *1: Brief (less than a week)* *2: Mid-length (between one week and three months)* *3: Long (three months or more)*	*Targeted Outcomes (significant results are marked with *)*
Effective Interventions Across All Outcomes			
ALMPs			
Blázquez, M., Herrarte, A., & Sáez, F. (2019).	Training programs	No information	Employment probability* Quality of employment*
	Training programs	No information	
Boockmann, B., & Brändle, T. (2019).	Job-search program	1	Integration into labor market* Exit from public welfare dependence*
	Counseling program	1	
Cockx, B., Lechner, M., & Bollens, J. (2019).	Vocational training	3	Employment*
Firth, D., Payne, C., & Payne, J. (1999).	Employment training	3	Exit unemployment*
Fitzenberger, B., Osikominu, A., & Völter, R. (2008).	Retraining	3	Employment rate*
Graversen, B. K., & van Ours, J. C. (2008).	Job-search, training and counseling program	2	Unemployment duration* Job-finding*
Lechner, M., Miquel, R., & Wunsch, C. (2007).	Training program	3	Employment rate* Earnings*
Rinne, U., Schneider, M., & Uhlendorff, A. (2011).	Training programs	3	Employment probabilities* Earnings*
Stenberg, A., & Westerlund, O. (2015).	Skills training program	3	Level of earnings*
Vinokur, A., van Ryn, M., Gramlich, E., & Price, R. (1991).	Job-search program	1	No of hours worked* No of employers* No of job changes* Earnings*
Other Interventions			
Noordzij, G., van Hooft, E. A. J., van Mierlo, H., van Dam, A., & Born, M. P. (2013).	Learning goal orientation training	1	Reemployment status*
Park, M., Lee, S., Nam, K. C., Noh, H., Lee, S., & Lee, B. J. (2020).	Mixed support services (i.e., training, emotional support, psychological services)	No information	Probability of being NEET*
Mixed Evidence Interventions			
ALMPs			
Crépon, B., Ferracci, M., & Fougère, D. (2012).	Public-sponsored training programs	No information	Exit from unemployment Unemployment recurrence*
Fitzenberger, B., & Völter, R. (2007).	Professional skills training	3	Employment rate* Benefit recipiency
Hirshleifer, S., McKenzie, D., Almeida, R., & Ridao-Cano, C. (2016).	Training programs	No information	Earnings Stability of the job*

Table 31: Employment Outcomes: Effectiveness of Interventions

Studies	*Type of Intervention*	*Length 1: Brief (less than a week) 2: Mid-length (between one week and three months) 3: Long (three months or more)*	*Targeted Outcomes (significant results are marked with *)*
Vuori, J., Silvonen, J., Vinokur, A. D., & Price, R. H. (2002).	Job-search program	No information	Reemployment Job stability* Wage rate
Other Interventions			
Hodzic, S., Ripoll, P., Lira, E., & Zenasni, F. (2015).	Emotional competencies intervention	1	Employability* Reemployment success* Job search
Hulshof, I. L., Demerouti, E., & Le Blanc, P. M. (2019).	Reemployment crafting and PsyCap	1	Job search* Financial situation
Interventions with No Significant Effect			
ALMPs			
Cockx, B., Lechner, M., & Bollens, J. (2019).	Orientation training	3	Employment
Creed, P., Hicks, R., & Machin, M. (1998).	Combination of occupational skills training and personal development training	2	Employment commitment Changes in employment status Current employment status
Firth, D., Payne, C., & Payne, J. (1999).	Employment action	3	Exit unemployment
Fitzenberger, B., Osikominu, A., & Völter, R. (2008).	Practice firms	3	Employment rate
Fitzenberger, B., & Völter, R. (2007).	Working in practice firm	3	Employment rate Benefit recipiency rate
	Retraining	3	
Nivorozhkin, A., & Nivorozhkin, E. (2007).	Vocational training programs	No information	Reemployment status
Other Interventions			
Carling, K., & Larsson, L. (2005).	Guarantee for early program participation	No information	Expected duration of unemployment Job-finding probability
Interventions with Negative Effects			
ALMPs			
Rosholm, M., & Skipper, L. (2009).	Training programs	2	Fraction of time spent unemployed* Wages
Rotar, L. (2019).	Work-first type of program	No information	Probability of reemployment* Probability of participation in the regular educational system*

Table 31: Employment Outcomes: Effectiveness of Interventions Continued

associated with demonstrating competences and gaining positive judgments. Learning goal orientation is generally associated with adaptive motivational processes and outcomes, leading individuals to increase their effort after failure and use more strategies and plans to achieve their goals. The learning goal orientation training tested by Noordzij et al. (2013) impacted the orientation goals of the treated and affected cognitive self-regulatory variables, which influenced job search intentions and led to an increase in reemployment rates twelve months later.

Although the wording used to describe the learning goal theory is different from mindset theory, it relies on the same constructs (Dweck and Leggett, 1988). Previous research highlighted positive correlations between learning goals and growth mindsets and between performance goals and fixed mindsets. The learning goal orientation training tested by Noordzij et al. (2013) impacted the orientation goals of the treated and affected cognitive self-regulatory variables (i.e., learning from failure and strategy awareness) that, in turn, influenced job search intentions and thus led to an increase in reemployment rates twelve months later (28% of the reemployed had been in the treatment condition, and 15% had been in the control condition).

2.4 Discussion and Conclusions

This review aimed to systematize interventions that have been carried out within the last thirty years to understand prior results in terms of employment and competency development. We proposed three categories of expected outcomes measured in the studies, namely, psychological, technical, and employment outcomes, and we examined how successful the trainings were in achieving those outcomes. Nevertheless, the review did not find consistent results on training effectiveness.

Out of the articles reviewed, six studies provided adequate data to analyze effect sizes. This is because measuring effect size requires having means or regression coefficients, standard deviations, and sample sizes for each group being compared. Regrettably, the majority of the articles failed to report all the necessary information, which made it challenging to accurately gauge the magnitude of the intervention effects in those studies.

The effect size of the technical outcomes was larger than that of the psychological outcomes. The largest effect size was the one of the employment outcomes. When comparing the significance of the results, we observed that psychological outcomes were the most likely to reach significance, followed by technical outcomes and then (re)employment outcomes. The most frequent expected outcomes within experimental studies were psychological outcomes, especially those related to self-esteem, self-confidence and self-efficacy, which are consistent with self-efficacy theories (Bandura, 1977; Deci and Ryan, 2008) that suggest impacts on reemployment (Ataç et al., 2018). However, technical outcomes were more likely than psychological outcomes to be reported as significant. Finally, outcomes linked to employment were the least likely to be significant. These findings stress the difficulty of remobilizing people to gain employment. Indeed, it seems easier to teach individuals specific skills (e.g., seeking resources) and to put them into a particular state of mind (e.g., motivated) than to lead them to a job. Nevertheless,

employment outcomes reached 66.6% significance.

When categorizing the type of outcomes measured in the articles, we did not use the classifications developed by Card et al. (2010). This was because we wanted to create larger categories to ease analyses and comparisons given the variety of labels used for the studied outcomes. Thus, instead of comparing duration of unemployment and direct employment and earnings, we compared direct employment (i.e., employment rate and probabilities as well as duration of unemployment), quality of employment (i.e., earnings and stability), re-engagement and independence indices (i.e., autonomy from public welfare and engagement in education), as well as psychological outcomes (e.g., self-confidence), and technical outcomes (e.g., seeking resources). Our analysis revealed that the least likely outcomes to show significance were the latter ones (66.6% significance rate), followed by employment outcomes (86.9%), and psychological outcomes (92.3%). When looking more closely at employment outcomes, only 50% of the independence outcomes reached significance, while 80.9% of the direct employment outcomes were significant, and 80% of the quality outcomes were significant. These findings suggest that interventions designed to improve psychological outcomes may have a greater impact on unemployed individuals compared to interventions focused on other outcomes, although more research is needed to fully understand the effectiveness of different types of interventions for job seekers.

By examining the type of training, we found that more than 70% of the interventions tested were ALMPs and only 8 interventions were non-ALMPs. Thus, it is important to note that ALMPs interventions have been extensively studied and have a stronger evidence base, making them a valuable component of employment programs. However, it appears that most non-ALMPs interventions can be effective in achieving their targeted outcomes, and should be considered in the design and implementation of effective employment programs. Therefore, a combination of ALMPs and non-ALMPs interventions could potentially lead to more effective employment support programs.

We sought to determine which types of training were the most effective in achieving employment, but we could not identify specific, clear categories for training type, as the majority of the information was found in secondary data studies (e.g., Smith 2011; Jewkes 2016). Secondary-data studies analyzed existing data (i.e., from previous experiments or public records); they did not always describe the type of training, some included all types of training in a single category (as is generally the case for ALMPs), and some described the training methods poorly.

Moreover, this literature review permitted to show that skill training programs, including vocational, employment, and retraining programs, that were relatively long in duration (at least three months) were more likely to achieve their targeted employment outcomes compared to shorter duration programs. Job-search training programs, which were relatively brief in duration (less than three months), also showed positive results in achieving employment outcomes. Moreover, counseling-based interventions, as well as learning-goal orientation program and a combination of training, emotional support, and psychological services, showed positive outcomes in achieving targeted employment outcomes. Additionally, working in practice firms and longer duration training programs, including orientation training, retraining, and vocational

training programs, did not reach statistical significance in terms of their employment outcomes. However, it's important to note that the specific nature of the practice firms and training programs, may have influenced the results but details are not reported. Two interventions that showed negative and significant results were a training program with a mid-length duration and placement into a work environment. This suggests that duration and type of intervention may play a role in achieving successful employment outcomes. There were also interventions that presented mixed evidence, achieving some employment outcomes but not others. This highlights the complexity of employment interventions and the need to carefully consider the specific outcomes targeted by each intervention. In summary, the duration of the intervention, type of intervention, and specific outcomes targeted all appear to be important factors influencing the effectiveness of employment interventions. Further research and evaluation of different interventions are needed to better understand their impact on employment outcomes and inform effective policy and practice in the field of employment training and support.

In addition, our research aimed to explore whether interventions available for job seekers targeted mindset. While none of the interventions analyzed were explicitly labeled as mindset interventions, the orientation-goal intervention (Noordzij et al., 2013) was relevant to the mindset theory. The intervention aimed to strengthen job seekers' situational learning goal orientation, improving their self-regulation in job search and enhancing their reemployment success. The learning goal theory shares similar constructs with the mindset theory. Previous research showed that learning goals are positively correlated with growth mindsets and performance goals with fixed mindsets. The learning goal orientation training tested by Noordzij et al. (2013) impacted treated individuals' orientation goals and affected cognitive self-regulatory variables, which improved job search intentions and led to higher reemployment rates after twelve months. Overall, this study suggests that mindset interventions could be integrated into job search training programs to enhance job seekers' outcomes.

While our review provides some insights, it is important to acknowledge its limitations. The current evidence base is limited, leaving policy makers ill-equipped to design and implement effective employment programs, while the vulnerable populations they serve are neglected. One major limitation is the lack of information about the effectiveness of different types of training. Although we can observe which studies had more favorable expected outcomes, we are unable to draw broader conclusions about the efficacy of different types of training. Our review also has a limited number of experimental studies, which makes it difficult to develop hypotheses about the effectiveness of different types of training. In future reviews, we recommend expanding the search criteria to include more studies and considering including literature beyond scientific publications to avoid publication bias.

Another limitation is the insufficient reporting of data in many studies, which prevented us from conducting more comprehensive effect size analyses. We were unable to provide clear evidence on which intervention types are most effective due to the lack of available data. While our inclusion and exclusion criteria were carefully considered, the exclusion of non-scientific literature may have negatively impacted the generalization of our results. Overall, these limitations

should be taken into consideration in future reviews to improve the quality and generalizability of findings.

Future research should prioritize the understanding and systematization of different stakeholders' perspectives to identify the real needs of unemployed individuals and propose effective training and policies for their integration into the labor market. However, assessing the skills necessary for employability can be subjective (Williams et al., 2019), and providing these skills to young people is essential for a country's growth and economic and social well-being (Wickramasinghe and Perera, 2010). As the labor market evolves, employability skills go beyond earning a degree and include a range of value-added experiences, skills, and qualities (Gedye and Beaumont, 2018). However, most policy theory discourses focus only on individual characteristics and overlook the reality of working life. Policymakers should engage in the employability discussion, considering all stakeholders and the perspectives of those affected by unemployment, and work to fully understand the labor market challenges and opportunities for unemployed individuals today.

3 The Pôle Emploi Pilot Study - Design of a Mindset Intervention

The previous literature review aimed to examine programs for unemployed individuals, and we found that none of them were explicitly labeled as mindset interventions. However, the orientation-goal intervention targets situational learning goal orientation to improve self-regulation in job search and increase reemployment success. Although the terminology is different, learning goal theory and mindset theory rely on similar constructs. The orientation-goal intervention impacted cognitive self-regulatory variables, influencing job search intentions and leading to a significant increase in reemployment rates twelve months later. However, the intervention could be considered intense, consisting of two sessions of three hours each with a week in between. Furthermore, no study has yet examined the relationship between mindsets and the intention to participate in a training program. Thus, in this section, we conduct a pilot study to design a briefer mindset intervention (i.e., ninety minutes) that could be efficient in promoting job seekers to adopt growth mindsets, leading them to be more willing to learn and participate more in training programs, ultimately resulting in finding (re)employment. The aim of this pilot study is to design a brief mindset intervention in order to explore the potential relationship between a growth mindset and job seekers' intention to participate in training programs, with the ultimate goal of helping unemployed individuals find (re)employment.

3.1 Introduction

In June 2019, Pôle Emploi (i.e., the French employment service) offered to help us work with forty-two[19] unqualified job seekers through six focus groups and six individual interviews[20] (see the protocols in Supplementary Materials 3.5). The purpose of our discussions was to better understand the training expectations of job seekers. We sought to identify what might lead these people to engage, or not, in a training program that is likely to increase their employability.

To do this, we offered them different exercises[21]. One exercise was the "Man from the Moon": Participants were asked to "imagine that I am a man from the moon, I have just arrived on Earth. You are the first human I meet, I approach you and ask you: "What is a training course at Pôle Emploi?". Another example of an exercise is photo-language: participants choose the image that best represents "what do you say to yourself when your counselor talks to you about training".

Job seekers had, on the whole, a very positive perception of training: "For me, training is help to get by. It's a way to move forward". Most of the participants believed that it is useful for helping them return to employment: "Today, without training, it is complicated to insert oneself in the world of work". In the group, the few participants who had already done training testified as to their satisfaction: "I was happy to do it anyway, it was useful. It gave me lot. It also gave me self-confidence". Others imagined how they would feel if they were able to get into a training program. The most common answer was that they would feel pride. They would be proud to be accepted, proud to "take it to the end when it is not easy", and proud to make those around them proud: "And then, we have the congratulations of the trainers afterwards, it would elevate something in our head".

There are many sources of motivation. Therefore, why do only 13% of unskilled job seekers access training, according to Pôle Emploi? This is probably because there are many obstacles. At first, the unemployed participants spontaneously mentioned were the constraints imposed by training: the location where the courses took place was too far from their home, compensation is perceived to be too low, childcare is difficult to arrange, the training courses are considered to be too long, etc [22]. There is also a certain amount of skepticism about training: is it truly enough to help one find a job? Is six months of training enough to learn a new job[23]?

Then, as the discussion progressed, we discovered one of the greatest barriers job seekers faced: the fear of failure[24]. "We wouldn't dare sign up because of our skills, will we be able to do it... Since I stopped working, I'm afraid of not being up to it, of not being able to do it. We always have this stress, we don't know what to expect! Maybe in training, there are things that are difficult. And then, the older you get, the slower you learn. And then, at my age, I don't

[19] $\overline{Age}$=45 years old, SD=14.2, 41% women

[20] For the focus groups, job seekers with undefined professional projects were selected and contacted by their agency. We proposed the individual interviews randomly to job seekers who were at their agency on a specific date.

[21] The precise protocol of this qualitative study is detailed in Appendix 3.5

[22] The constraints imposed by training were cited at least 29 times.

[23] The skepticism about training was cited at least 25 times by the unemployed individuals.

[24] The fear of failure was mentioned at least 36 times.

really want to go back to school". Thus, we can assume that many of these job seekers believed that intelligence is a fixed entity, also known as a fixed mindset. This assumption is consistent with a recent study that found that people of low socioeconomic status are proportionately more likely than others to believe that one cannot develop intelligence (Destin et al., 2019).

Hence, unemployed individuals may be more likely to hold a fixed mindset than a growth mindset. Notably, previous research has shown that a growth mindset is associated with challenge seeking and achievement motivation, while a fixed mindset is associated with challenge avoidance and drop out (Mueller and Dweck, 1998). Moreover, it seems that no research has yet tested the relationship between mindset and intent to participate in training programs and/or gaining employment. The present study aims to design a brief mindset intervention to test this relationship.

In addition, many unemployed participants also described a lack of interest[25] regarding the training—and the jobs—that are proposed to them: "They propose to me training that is not related to what I want to do". However, in a recent study, O'Keefe et al. (2018) found that individuals who believe that interests can be developed (i.e., a growth mindset of interest) are likely to experience higher interest in areas outside their existing interests. Because many job seekers must undergo a transition, they may benefit from strengthening their growth mindset of interest. However, it seems that no studies have yet tested interest mindset interventions among job seekers. This pilot study is thus designed to enhance interest growth mindsets among unemployed people.

Here, our aim was to design a mindset intervention that would encourage job seekers to participate in training programs and find (re)employment by promoting growth mindsets related to intelligence and interest. More specifically, a key contribution of this study lies in the design of a mindset intervention aimed at promoting growth mindsets of intelligence and interest to encourage job seekers to participate in training programs for (re)employment. The study seeks to determine whether this intervention leads to higher growth mindsets and greater intention to enroll in a training program than an active control intervention. The objectives of the pilot study are presented in Figure 15.

3.2 The Pilot Study

Development of the Procedure

This study took place at Pôle Emploi, a French government agency responsible for helping job seekers find employment and providing support to employers in recruiting new employees. The agency offers a range of services, including job listings, training and vocational guidance, unemployment benefits, and assistance with job search and placement. Pôle Emploi also provides resources for self-employed individuals and entrepreneurs looking to start their own business. Its services are available to both French citizens and foreign residents in France.

The experiment was conceptualized and executed in collaboration with the Director of France

[25]This was the fourth most cited barrier by the unemployed participants, and was cited at least nine times.

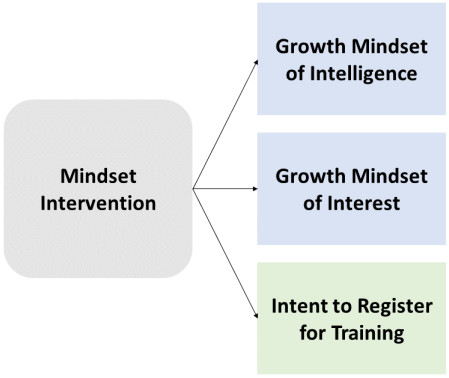


Figure 15: Visualizing the Objectives of the Current Study

Training and Competencies Development in Territories, and in coordination with the management of the ARA region. Our initial meeting with these stakeholders was in May 2019, where they raised concerns about the reluctance of long-term unemployed individuals to participate in qualified training programs. We hypothesized that mindsets could be a contributing factor, which prompted us to conduct a qualitative study, as mentioned in the introduction. Based on the report from the interviews, we organized a one-day workshop and proposed an experimental approach to address the issue. We then worked on developing the feasibility conditions, such as involving the regional management and Pôle Emploi advisors, selecting appropriate sample methods, and developing control and treatment workshops. To ensure a successful intervention, we formed a steering committee that included national and regional stakeholders, such as the deputy director, agency directors, and regional training director. We met with these stakeholders around seven times between June 2019 and September 2019 to ensure that all aspects of the intervention were thoroughly prepared for. The timeline of the pilot study is presented in Figure 16.

Participants and design

Between September and October 2019, a sample of 337 job seekers with undefined professional projects was contacted by Pôle Emploi for a half-day workshop called "Training, why not me?". There were approximately twenty job seekers per session. The recruitment method employed in the study may have introduced selection bias as the sample was drawn exclusively from job seekers already registered with Pôle Emploi and lacking clear professional projects. This could have led to a bias in the selection of participants, as individuals who are not registered with Pôle Emploi or have a specific training requirement may possess distinct characteristics or motivations. However, we only compared job seekers who came: when they arrived at the employment center, they were randomly directed to one of two rooms for the different conditions:

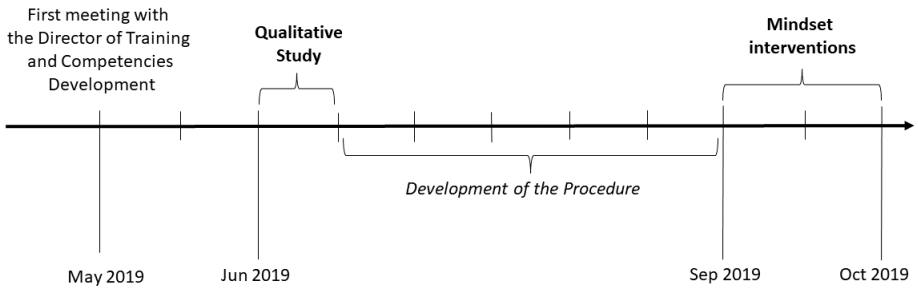


Figure 16: Timeline of the Pilot Study

the control condition and the treatment condition[26]. The participants were told that the groups were divided for practical reasons and that the workshops would be identical.

Most of the studies reviewed in the first part of this chapter that examined reemployment interventions were conducted in groups of eight to twelve participants and were relatively long. In fact, only six interventions lasted less than a week. In contrast, the mindset intervention we tested was much briefer than most examined interventions, lasting only ninety minutes.

Procedure

Job seekers were randomly selected (based on the criteria cited above) and contacted by the agency. Half were then randomly assigned to the mindset intervention, which aimed to promote growth mindsets of intelligence and interest; the other half were assigned to an intervention about the importance of training programs (i.e., the active control condition). The mindset interventions were delivered by professional trainers. The trainers who delivered the control interventions were Pôle Emploi advisors who worked in the two agencies where the study was implemented. While these trainers had prior experience in conducting training and meetings with unemployed individuals, they received additional training to deliver the specific content of the control intervention. This was done to ensure that the deployment of the interventions was comparable. Prior to the start of the sessions, the facilitators underwent a one-day training program led by the experiment team. The facilitators were given the opportunity to experience the workshops as participants before practicing their role as session leaders. All information, key messages and protocols delivered within the interventions were provided through videos and

[26]The randomization should be done after the job seekers arrive because of the large number of job seekers who do not show up: approximately 30% of the contacted job seekers are no-shows, according to Pôle Emploi.

slideshows presentations. Moreover, the control and treatment interventions were comparable in terms of length (i.e., ninety minutes) and activities (i.e., both interventions included videos, group discussions and neuroscience information).

After the interventions, job seekers were reunited for a common intervention that included a presentation of the training programs available in their region and information about their funding. Following the intervention, participants were administered a questionnaire to measure their growth mindsets of intelligence and interest, satisfaction with the intervention, and their intention to register for a training course.

Control intervention

This intervention lasted 90 minutes. After a friendly introduction and a quick icebreaker, the participants watched the video testimony of Romain, a thirty-eight-year-old sales consultant in a men's ready-to-wear store. Romain used to be a lathe mill operator in a factory. After eleven years at his company, he was laid off for economic reasons. After a period of unemployment, Romain obtained a precarious contract as a cashier in a supermarket. There, he experienced contact with customers, and above all, he discovered his passion: he dreamed of becoming a salesman, specifically in ready-to-wear clothing if possible. Unfortunately, he had no experience in this field, and he could not find a job. Therefore, he decided to embark on an eight-month training course. The program included weeks of classes and periods of work experience. Romain's efforts were finally rewarded: the company where he did an internship offered him a permanent job! Now, this new job suits him perfectly, and he is blossoming. Fulfilled by this experience, Romain concludes with sincere enthusiasm that "if you know what you want to do, as a job, if you have the opportunity to do a training via Pôle Emploi, you should not hesitate!" After the video played, the participants were asked by the facilitators to discuss the following questions: What do you think of Romain's experience? What did you learn from it? What questions do you have about such training? Where can you find useful information?

Next, to ensure that the interventions were comparable, facilitators taught some neuroscientific information to the participants. More specifically, they explained to the participants what learning is from a scientific point of view. Their key message was that "we can all learn". Participants discovered, for example, that babies are learning things in the womb. Learning is therefore a natural skill for human beings. Moreover, learning involves the dopamine system, a very old circuit in humans: when we learn, this system triggers a flash of dopamine, a neurotransmitter that contributes to the mechanisms of attention and pleasure. We are therefore programmed to take pleasure in learning new things.

Treatment condition

This intervention also lasted 90 minutes and the precise protocol is presented in Supplementary Materials 3.5. After a friendly introduction and a quick icebreaker, participants played the

"numbers game"[27]. Numbers appeared and disappeared on the screen, and individuals were instructed to try to remember the highest number of digits. Then, the facilitators asked them how many digits they could remember with training and he suggested them to keep this game in mind, they would come back to it later.

Then, to strengthen their growth mindset, we followed the three steps suggested by McGonigal (2015): discovery of a new paradigm, confirmation of this new paradigm, and the public expression of the paradigm (i.e., also known as "saying-is-believing exercise", Higgins and Rholes, 1978). Thus, participants watched clips from a thriller miniseries in which one character tells another the story of Steve Faloon: "Steven Faloon was perhaps in his early twenties. And he was a true running enthusiast. He knew his physical abilities, but he doubted his mental abilities. He asked himself, "How many numbers can I memorize?" And the very next day, he spent an hour trying to memorize as many numbers as possible every day. After ten days, he realized, "I can't do it, I might as well give up. But Steve eventually made progress. So much so that after two hundred days of effort, he was able to retain sequences of numbers of incredible length: any new sequence of eighty numbers!". The character then concludes, "Even if we doubt, we all have the ability to grow" (i.e., discovery of a new paradigm).

Then, individuals were asked to think about an activity that was difficult for them at first but in which they persevered and improved. Then, they were asked to share their experience in pairs (i.e., confirmation through one's personal experience and a saying-is-believing exercise). After that, in order to emphasize the message and because people tend to believe information from credible sources, they watched a popular science video with an expert in learning sciences about brain plasticity: "Sometimes we tend to believe—from school on—that either we are good at something or we are not. For example, if you think you're not good at studying, you think you'd better do something else. So, a fundamental question you might ask yourself, when you're thinking about training and, perhaps, entering a new profession, is this: To be successful, do you have to be good at it? Brain scientists have conducted scientific research to find the answer. For example, the Swedish scientist Anders Ericsson went to a music school and asked the teacher if some violinists were more talented than others. The teacher replied, "Yes, absolutely!" and gave him a list of the students he considered to be the most gifted. Anders Ericsson then questions each student one by one. And he discovered that the ones who seemed to be the most talented were, in fact, the ones who had spent the most time perfecting their musical instruments every day. Then, Ericsson did the same research in other disciplines: physical—like dance or soccer—and intellectual—like chess or science. Each time, his discovery was the same: Of course, some people have it easier than others, at the beginning. But in the end, those who progress the most are always those who spend the most time perfecting their skills. Just like Steve Faloon with his number sequences. How do you explain that? When you learn something intensively, some parts of the brain become more efficient and faster, and other parts of the brain grow bigger: The brain is like a muscle! More precisely, we know today that the brain develops when it is

[27]This game was designed and used in a mindset intervention tested in France by Huillery et al. (2021)

confronted with difficulties and when we make mistakes that we immediately try to correct. In conclusion, I would like to quote another great specialist, the American Carol Dweck, who said, "People who manage to progress in life are often those who have understood that the brain can develop, that intelligence can develop, and that we can learn new things, be interested in new things and succeed in new things at any age."

Finally, participants briefly shared what struck them as interesting by completing the following sentence: "Following these exchanges, what I tell myself, for my professional project, is that...". The protocol of this intervention is presented in Supplementary Materials 3.5

Common intervention

After ninety minutes, the participants in the two workshops—who thought they were following exactly the same program—left their respective rooms and gathered together in another room for the second part of the meeting. There, the facilitators presented the types of jobs offered by employers in the region as well as the free training courses available to prepare for them. Finally, they explained to the participants the steps to follow to apply for the jobs with the help of their Pôle Emploi advisor.

Hypotheses and dependent measures

We implemented a mindset intervention designed to encourage job seekers to believe that their abilities and interests are malleable in order to prompt them to enroll in training.

Drawing on prior research that have shown the effectiveness of mindset interventions in fostering growth mindset of intelligence among students (e.g., Blackwell et al., 2007), we hypothesize that such interventions can also improve the growth mindset of intelligence among job seekers. Therefore, we propose the following hypothesis:

H1: Job seekers who received the mindset intervention will exhibit greater growth mindset of intelligence compared to those in the control condition.

Moreover, prior research has demonstrated that a short intervention can increase the growth mindset of interest among students (O'Keefe et al., 2018). Based on this, we hypothesize that similar interventions can also have a positive effect on the growth mindset of interest among job seekers. Therefore, we propose the following hypothesis:

H2: Job seekers in the treatment condition will exhibit higher growth mindsets of interest compared to those in the control condition.

Furthermore, previous studies have found that individuals with a growth mindset tend to pursue challenges more often than those with a fixed mindset (e.g., Bandura and Dweck, 1985). Therefore, we postulate that job seekers who hold higher growth mindsets of intelligence and interest are more likely to engage in training programs. Thus, we propose the following hypothesis:

H3: Job seekers in the treatment condition will have a stronger intention to register for training than job seekers in the control condition.

To test these hypotheses, all participants were asked to complete a questionnaire at the end of the intervention. As in the work of Noordzij et al. (2013), we measured the specific targeted outcomes of the tested intervention (i.e., mindsets) and intention (i.e., intention to register for a training program). We also measured the participants' level of the satisfaction related to the workshops as a manipulation check. Because of the studied population, all scales were adapted to be easy to understand. In addition, no debriefing was organized with the participants, so we needed to be very cautious not to destabilize them with questions that would make them feel uncomfortable (see the Supplementary Material 3.5 for full scales).

Responses were given on a five-point Likert scale (1 = "totally disagree", 5 = "totally agree").

Growth mindset of intelligence

We used nine items to measure the malleability of abilities (e.g., "I think I can develop new skills over time" and "Whatever the job, I think I am able to develop new skills"). These items were adapted from Da Fonseca et al. (2007) by focusing on competencies rather than intelligence and transforming the sentences into the first person singular to ease understanding. We also added three items with a negative sentence structure to decrease the risk of social desirability affecting the responses. Because of the poor alpha of the scale (α=.58), the items were considered individually.

Growth mindset of interest

We used four items to measure the malleability of interest (e.g., "Even though I have a preference for a certain job, I think I could be interested in other jobs too" and "There are jobs that do not appeal to me at first but that could end up interesting me"). These items were adapted from O'Keefe et al. (2018) by focusing on jobs rather than interests, transforming the sentences into the first person singular and translating them into French. Given the poor alpha (α=.55), the items were considered individually.

Satisfaction

We used three items to measure the satisfaction related to the workshops (e.g., "Today's meeting was useful for me" and "I enjoyed the first part of the meeting", α=.80). The means were averaged before analysis.

Intention to register

We use one item to measure intention to register for training (i.e., "I intend to enroll in training").

3.3 Results

We analyzed the 267 completed and returned questionnaires from the job seekers. Unfortunately, some participants left the sessions without filling out the questionnaires (N=70) and were hence excluded from the analyses. In the control condition, 131 job seekers completed and returned the questionnaires to us, and there were 136 job seekers in the treatment condition.

Manipulation Checks

As a manipulation check of the randomized assignment to each condition, we compared the sociodemographic information of the unemployed individuals in the two conditions. The results are presented in Table 32.

The groups of unemployed individuals in the two conditions were very alike in terms of gender division ($p>.05$, chi-squared test). They are also similar regarding the districts they lived in, with 31.6% of the job seekers in the treatment condition and 23.7% in the control condition living in a priority district ($p>.05$, chi-squared test). Education levels were comparable between the two conditions ($p>.05$, chi-squared test). Moreover, the treatment and control groups were equivalent in terms of both the number of jobs received and the amount of training received ($ps>.05$, t tests). However, unemployed individuals in the control condition were on average older than unemployed individuals in the treatment condition ($p<.05$, t test). This difference may impact further analyses. Indeed, older people may have stronger fixed mindsets of intelligence than younger people (i.e., they may believe that as one ages, one loses the ability to learn new things), which could lead to lower intention to participate in training (i.e., they may believe that no matter what, after a certain age, it would not be possible to find a job). However, the difference in average age is small (i.e., less than three years), and therefore, the impact of this factor on the analysis is limited.

To ensure the comparability of the two interventions, we assessed the participants' satisfaction with both interventions after completing them. The means of satisfaction looked very alike in the control condition ($\overline{M}$=3.94, SD=.72) and in the treatment condition ($\overline{M}$=M=3.88, SD=.87).

Therefore, we can conclude that the potential effects on growth mindsets and intention would not be confounded by differences in the quality of the interventions. Thus, analyses on growth mindsets and intention could be performed.

Impact of the Interventions on Mindset of Intelligence

First, to analyze the impact of the intervention on job seekers' mindsets, we compared the growth mindset of intelligence between conditions.

Table 32: Descriptive summary by condition

	Treatment N=136	Control N=131	p.overall
Age (in years)	39.3 (11.0)	42.2 (10.4)	0.030
Gender:			0.911
Men	58 (42.6%)	54 (41.2%)	
Women	78 (57.4%)	77 (58.8%)	
Priority District:			0.180
Yes	43 (31.6%)	31 (23.7%)	
No	88 (64.7%)	98 (74.8%)	
Unknown	5 (3.68%)	2 (1.53%)	
Education:			0.253
No formal education	8 (6.11%)	5 (4.07%)	
Primary School up to 8th Grade[28]	4 (3.05%)	10 (8.13%)	
8th Grade[29]	2 (1.53%)	5 (4.07%)	
9th Grade[30]	21 (16.0%)	9 (7.32%)	
10th or 11th Grade[31]	5 (3.82%)	6 (4.88%)	
Senior year without GPA[32]	6 (4.58%)	6 (4.88%)	
Senior Year with GPA	10 (7.63%)	10 (8.13%)	
Youth Training or equivalence[33]	71 (54.2%)	71 (57.7%)	
2 years after GPA	3 (2.29%)	1 (0.81%)	
5 years after GPA	1 (0.76%)	0 (0.00%)	
Number of jobs received	3.60 (3.20)	3.66 (3.32)	0.878
Number of trainings provided	1.84 (1.38)	1.84 (1.33)	0.993

Hypothesis: *H1: Job seekers who received the mindset intervention will exhibit greater growth mindset of intelligence compared to those in the control condition.*

Results: After the mindset intervention, the mindsets of intelligence were equivalent across conditions. Therefore, *H1* was not confirmed.

Support for results:

When we compared the growth mindsets after treatment, it seemed that many items were similar between conditions. For instance, for the item "I think I can develop new skills over

[28] Until Quatrième in France
[29] Quatrième in France
[30] Troisième in France
[31] Seconde or première in the French education system
[32] Bac ou équivalent, Diplôme non obtenu in France
[33] CAP or BEP in France

time", the treatment group mean was 4.25 (SD=.82); this figure was 4.19 for the control group (SD=.77, p>.05, t test). The means were also very similar between the two groups for the following items: "Whatever the job, I think I am able to develop new skills" ($\overline{Mtreatment}$=3.99, SD=.98, $\overline{Mcontrol}$=4.10, SD=.85), "Competence is mostly a matter of having or not having a gift" ($\overline{Mtreatment}$=3.53, SD=1.33, $\overline{Mcontrol}$=3.57, SD=1.25) and "I believe I can always develop new skills" ($\overline{Mtreatment}$=4.26, SD=1.33, $\overline{Mcontrol}$=4.22, SD=1.24, ps>.05, t tests).

Some other items seemed slightly higher among the control condition than the treatment one. It is the case for "I think it will be difficult for me to develop new skills" ($\overline{Mcontrol}$=3.54, SD=1.34, $\overline{Mtreatment}$=3.36, SD=1.31), "Personally, I'm not sure I can develop my skills" ($\overline{Mcontrol}$=3.62, SD=1.26, $\overline{Mtreatment}$=3.44, SD=1.35) and "To be honest, it is not easy for me to develop new skills" ($\overline{Mcontrol}$=3.59, SD=1.29, $\overline{Mcontrol}$=3.27, SD=1.28, all ps>.05, t tests).

Finally, two items looked slightly higher among the treatment conditions: "For me, it is not easy to develop new skills" ($\overline{Mtreatment}$=2.74, SD=1.33, $\overline{Mcontrol}$=2.41, SD=1.24, p>.05, t test) and "With enough time and effort, I think I can develop new skills" ($\overline{Mtreatment}$=4.23, SD=.69, $\overline{Mcontrol}$=4.10, SD=.88, p>.05, t test).

In conclusion, we can say that the mindsets of intelligence were not significantly higher in the treatment condition than in the control condition after the mindset intervention. Thus, *H1* is not confirmed. However, the interventions may have had an impact on interest mindsets, and this should be examined.

Impact of the Interventions on Interest Mindset

Then, we compared the interest mindsets between conditions.

Hypothesis: *H2: Job seekers in the treatment condition will exhibit higher growth mindsets of interest compared to those in the control condition.*

Results: After the mindset intervention, the mindsets of interest were equivalent between conditions. Therefore, *H2* was not confirmed.

Support for results:

Comparing items, we found that all the scores were very similar between conditions: "Even though I have a preference for a certain job, I think I could be interested in other jobs too" ($\overline{Mcontrol}$=3.77, SD=1.02; $\overline{Mtreatment}$=3.77, SD=1.12), "Even if they introduce me to new jobs, I don't think it will really change what I am interested in." ($\overline{Mcontrol}$=2.70, SD=1.14, $\overline{Mtreatment}$=2.80, SD=1.23), "There are jobs that do not appeal to me at first, but that could end up interesting me." ($\overline{Mcontrol}$=3.31, SD=1.06, $\overline{Mtreatment}$=3.45, SD=1.15), "To be honest, the jobs I'm interested in will stay the same. I don't think this will really change." ($\overline{Mcontrol}$=2.90, SD=1.30, $\overline{Mtreatment}$=1.22, SD=1.22, all ps>.05, t tests).

Therefore, *H2* was not confirmed, and the interventions did not enhance participants' interest mindsets. However, the lack of difference in mindsets (intelligence and interest) between conditions may be due to miscalibrated scales, as suggested by the poor alphas of each scale.

Indeed, the mindset intervention may have had an impact we did not measure. Hence, to verify whether the interventions did not have any effect on job seekers who received them, the outcome related to intention to participate in a training should be analyzed.

Impact of the Interventions on Intention to Participate in a Training Program

Finally, we compared the intention to register for training between the control and treatment conditions.

Hypothesis: *H3: Job seekers in the treatment condition will have a stronger intention to register for training than job seekers in the control condition.*

Results: Job seekers in the treatment condition had marginally stronger intentions to register. Thus, *H3* was partially confirmed.

Support for results:

When we compared the intention scores between conditions, the mean of the treatment condition seemed to be slightly higher ($\overline{M}$=3.87, SD=1.15) than that of the control condition ($\overline{M}$=3.63, SD=1.21).

Computing a t test, we found that this difference was marginal (t=1.6(265.27), p=.1).

Therefore, job seekers in the treatment condition had stronger intentions to register for a training program. *H3* was thus partially confirmed.

3.4 Discussion

This pilot study aimed to develop a mindset intervention that can effectively enhance the growth mindsets of intelligence and interest and increase intention to participate in training programs among job seekers. We present here some inconclusive results of the intervention's effects on mindsets and intention to participate in a training program.

This pilot study had several limitations. First, the adapted scales seemed to be miscalibrated. In fact, while the scales were supposed to be averaged for the analyses, they presented poor alphas. Thus, all the items were considered individually. In addition, the intention-to-register scale included only one item.

Moreover, because participants did not know they were taking part in an experiment, we could not measure mindsets and intention to register before and after treatment. As a matter of fact, mindsets and intention looked similar after treatment in both conditions; but we do not know whether this was because the mindset interventions were ineffective or because the participant groups were significantly different before treatment and the mindset interventions reduced these differences.

Furthermore, we were not able to measure the actual training registration behaviors or employment status of the job seekers with a follow-up, as planned. We planned to examine Pôle Emploi's data of unemployed individuals in the treatment and control conditions for 12

months. Unfortunately, a legal problem in the contract with Pôle Emploi undermined this follow-up. Indeed, in order to obtain the unemployed individuals' information for a year, we signed an amendment to the original legal contract that originally ended in December 2019 so that we could access information until December 2020. However, in January 2020 (i.e., two months after the beginning of the follow-up), one of the organization's legal experts argued that we should have created a new contract and that Pôle Emploi could not give us any more information. However, this study took place at the end of 2019. Thus, a few months later, the COVID pandemic hit France, and all training was canceled, and most recruiting was placed on hold anyway. Therefore, we can assume that even if we had obtained information, no evolution would have been found among job seekers in 2020.

In addition, the studies discussed in this paper have some limitations, particularly related to the potential selection bias introduced during the recruitment process. In the qualitative study presented in introduction, job seekers were selected and contacted by their agency, and individual interviews were proposed randomly only to job seekers who were at their agency on a specific date. This method may have led to a bias in the selection of participants, as those who were not present on that specific date or who did not show up may have different characteristics or motivations. Similarly, the recruitment method in the Pôle Emploi workshop study may have introduced selection bias, as the sample only includes job seekers who were already registered with Pôle Emploi and without clear professional projects. This may limit the generalizability of the findings to a broader population of job seekers. However, the study attempted to minimize this bias by randomly assigning participants who showed up to the control and treatment conditions and informing them that the groups were divided for practical reasons and that the workshops would be identical. Additionally, because the studied population is often underqualified and sometimes not native French speakers, all the materials for the interventions and the questionnaires should be very easy to understand. Therefore, adapted scales should be developed and pretested.

In addition, for every workshop they organize, even if individuals are specifically summoned, Pôle Emploi registers many no-shows among job seekers. For this reason, the number of job seekers summoned must be higher than the final sample size needed, and randomization must be done after their arrival for the intervention.

The aim of this chapter was to examine the current situation of mindset interventions among the programs provided for job seekers with the aim of remobilizing them to seek employment. In the first section of this chapter, we provided a literature review of all the training programs proposed in the last thirty years. One paper presented an intervention related to a mindset intervention (Noordzij et al., 2013). Even though the aim of the program was not to enhance participants' growth mindset, its objective was to reinforce learning goal orientation, which is associated with a growth mindset (Dupeyrat and Mariné, 2005). The intervention in Noordzij et al. (2013) led to positive employment outcomes. Therefore, while mindsets are generally studied among students, it might be relevant to investigate them among job seekers as well. In the second chapter of this section, we conducted a pilot study designed to promote higher

growth mindsets of intelligence and interest in order to remobilize job seekers to attend training programs and seek reemployment. As our results were inconclusive, future studies should test this design in more controlled trials. Indeed, if this intervention was successful, it would encourage job seekers to participate in training programs and eventually find a job by making them believe they have the capacity to do so. Therefore, this study has important implications for strategies to reduce unemployment. Is it worth noting that the literature review highlighted that programs that are long in duration (more than 3 months) are more likely to be effective than shorter duration programs. On the other hand, mindset interventions would represent an efficient tool for public policy makers due to its short duration (i.e., 90 minutes) and its ease of deployment (i.e., key messages and protocols conveyed through videos).

3.5 Supplementary Materials

Literature Review Table

Table 1: Type of intervention or program, expected outcomes and reported significance of the main results

1. Studies	2. Intervention	3. Description of the intervention	4. Expected outcomes
Aysina et al., 2016	Job interview simulation	Job Interview Simulation Training (JIST) is a computer-based training simulation created to improve job interview skills.	1. Job interview self-confidence* 2. Job interview performance*
Blázquez et al., 2019‡	Active labor market program	Training programs upgrade workers' skills. Job search consists of counseling and support services, as well as providing access and information on the labor market situation and trends.	3a. Employment probability* 3b. Quality of employment*
Boockmann & Brändle, 2019‡	Active labor market program	The program is oriented toward integrating older long-term unemployed workers into the labor market.	3a. Integration into labor market* 3b. Exit from public welfare dependence*
Bullock-Yowell et al., 2014	Cognitive information processing approach	The intervention consists of a presentation of the CASVE cycle (communication, analysis, synthesis, valuing, and execution) to develop greater knowledge about individual values, interests, and skills to improve career decision making.	1. Negative thinking 2. Decision-making
Carling & Larsson, 2005‡	Guarantee for early program participation	By guaranteeing the assignment to a program within 100 days, long-term open unemployment is avoided.	3a. Expected duration of unemployment 3b. Job-finding probability
Cockx, Lechner and Bollens, 2019‡	Short-term vocational training, longer-term vocational training and orientation training.	Short-term (less than 6 months) vocational training (SVT), longer-term (between 6 and 10 months) vocational training (LVT) and orientation training (OT) that aims to help determine a clear professional goal.	3. Employment* [3]
Creed et al., 1998	Occupational skills/personal development training courses	Work-preparation programs that aim to provide unemployed participants the necessary skills to obtain and maintain paid work, including a combination of occupational skills training (e.g., computer awareness, typing, trades assisting) and personal development training (grooming, communication, preparing for interviews).	1a. Levels of depression* 1b. Helplessness* 1c. Psychological distress* 1d. Life satisfaction* 1e. Self-esteem* 1f. Self-esteem employment 1g. Employment-specific depression 1h. Guilt 1i. Anger 1j. Social support 1k. Employment value 1l. Employment expectations* 2a. Use of professionals/agencies 3a. Employment commitment 3b. Changes in employment status 3c. Current employment status

[3] Significant for vocational programs but no effects for orientation programs

Table 1 continued from previous page

1. Studies	2. Intervention	3. Description of the intervention	4. Expected outcomes
Creed et al., 2001	Occupational skills training	Combination of generic occupational skills training (e.g., computer and keyboard skills), specific occupational skills training (e.g., warehousing, retail), and personal development training to assist participants in preparing for job interviews and new jobs (e.g., grooming, self-confidence).	1a. Self-steem* 1b. Job-search self-efficacy*
Crépon, Ferracci and Fougère, 2012‡	Public-sponsored training programs		3a. Exit rate from unemployment 3b. Unemployment recurrence*
Firth, Payne and Payne, 1999‡	Active labor market programs	Employment training consists of training and job placements, with over half of the participants receiving a formal qualification. Employment action focuses on work experience rather than training.	3. Exit unemployment*[4]
Fitzenberger et al., 2008‡	Active labor market programs	Specific professional skill and technique training provides skills and professional knowledge. Working in a practice firm simulates a real job. Retraining provides complete vocational training.	3. Employment rate*[5]
Fitzenberger & Völter, 2007‡	Active labor market programs	Specific professional skills and techniques, working in practice firm and retraining.	3a. Employment rate*[6] 3b. Benefit recipiency rate
Graversen & van Ours, 2008‡	Active labor market program	Mandatory job search programs, intensive counseling and mandatory training programs.	3a. Unemployment duration* 3b. Job-finding*
Hillman & Knill, 2018	Employability skills training program	Activities include oral communication skills (e.g., dealing with conflict, interviews); written communication skills (e.g., writing basic emails, constructing a cover letter), resource knowledge (e.g., knowing where to access training locally, networking); and a personal toolkit (e.g., analyzing one's personal strengths, weaknesses, opportunities and threats).	1. Self-confidence in a job search*
Hirshleifer et al, 2016‡	Active labor market programs	The majority of training courses offered are general vocational training courses covering a wide range of vocations.	3a. Earnings 3b. Stability of the job*
Hodzic et al., 2015	Emotional competencies intervention	The intervention aimed to improve emotional competencies and develop effective emotion regulation strategies.	1. Entrepreneurial self-efficacy* 2. Entrepreneurial intention 3a. Employability* 3b. Reemployment success* 3c. Job search

[4] Significant for employment training but no effect for employment action.
[5] Significant for most programs but not for practice firms.

Table 1 continued from previous page

1. Studies	2. Intervention	3. Description of the intervention	4. Expected outcomes
Hulshof et al., 2019	Job search demands-resources intervention	Training to implement reemployment crafting and PsyCap into job-search routines in order to provide new behavioral techniques that can be used to enhance well-being and job-search behavior.	1a. Positive affect 1b. Negative affect* 1c. Fatigue severity 1d. Motivation* 1e. Psychological capital* 2a. Seeking resources* 2b. Seeking challenges* 2c. Reducing demands 2d. Career exploration* 2e. Networking intensity* 2f. Networking quality* 3a. Job search* 3b. Financial situation
Lechner et al., 2007‡	Active labor market programs	Adjust the skills that have become largely obsolete. A common feature of these training programs was that, usually, the human capital investment was substantial.	3a. Employment rate* 3b. Earnings*
Nivorozhkin & Nivorozhkin, 2007‡	Active labor market programs	Vocational training programs.	3. Reemployment status
Noordzij et al., 2013	Learning-goal orientation training on self-regulation	The aim is to strengthen job seekers' situational LGO as such to improve self-regulation in job search and enhance reemployment success.	1a. Job-search self-efficacy 1b. Job search intentions* 2a. Learning from failure* 2b. Strategy awareness* 2c. Job-search goal orientation* 3. Reemployment status*
Park et al., 2020‡	Youth employment support program	The program provides various support services to youth at the individual level (e.g., vocational education and training, psychological services, emotional support), to the families of the participant (e.g., to improve parenting skills with coaching and training), and at the community level.	1. Intention to find a job* 3. Probability of being not in employment, education, or training (NEET).*
Proudfoot et al., 1997	Cognitive-behavioral training on job-finding	Training aims to identify and modify attributional styles.	1a. Self-esteem* 1b. Job-seeking self-efficacy* 1c. Mental strain (GHQ)* 1d. Attributional style (composite)* 1e. Motivation for work* 1f. Life satisfaction*
Rinne, Schneider and Uhlendorff, 2011‡	Active labor market programs	Public training programs.	3a. Employment probabilities* 3b. Earnings*
Rosholm & Skipper, 2009‡	Active labor market programs	Classroom competence enhancing training in order to maintain and improve the qualifications of the labor force.	3a. Fraction of time spent unemployed*(-) 3b. Wages
Rotar, 2019‡	Active labor market programs	Work-first type of programs	3a. Probability of reemployment*(-) 3b. Probability of participation in the regular educational system*(-)
Stenberg & Westerlund, 2015	Active labor market programs	General and specific skills training	3. Level of earnings*
Vinokur et al., 1997	Job-search skill enhancement program	The aim is to enhance job-search skills.	1a. Job-search self-efficacy* 1b. Self-esteem* 2. Locus of control*
Vinokur et al., 1991	Job-search skill enhancement program	The aim is to enhance job-search skills.	3a. Working 30+ hours in 30 months* 3b. Number of employers* 3c. Number of job changes*
Vuori et al., 2002	Job search program	The program aimed to support participants' role change from passive unemployed individuals to active job seekers and also aimed to help prevent setbacks during the job-search process.	1a. Psychological distress* 1b. Depressive symptoms 1c. Job satisfaction 3a. Reemployment 3b. Job stability* 3c. Wage rate

Note. This table considers secondary data analyses and experimental and quasiexperimental studies (N = 29).
1. Studies. Record analysis or secondary data analysis is marked with ‡, and significant results on target outcomes are marked with *.
2. Briefly describes the intervention (keywords).
3. Further description of the intervention.
4. Describes target outcomes. 1. psychological, 2. technical, 3. employment/reemployment.

Protocols of the Qualitative Study

- **Focus Groups Protocol**

  The objective of the focus group is to identify the factors that hinder or facilitate enrollment in long-term training. During the focus group, two facilitators will be present: one will lead the discussion, and the other will transcribe the participants' responses on the computer.

  1. Setting the Framework (10 minutes)

  Objective: To reassure the participants and create a trusting atmosphere.

  To do:

  - Greet the participants warmly and kindly.
  - Seat them around the table to encourage exchange.
  - Introduce yourselves: "*Hello, thank you all for coming. We know some of you have come from far away, and we want to thank you for making the effort to be here. We are XX and XX, and our goal is to understand with you what is happening in the Pôle Emploi training programs. We are external to Pôle Emploi, and we will not repeat anything you tell us to your advisors. Everything you say today will remain confidential. So, if you still agree to participate in this workshop with us, we ask you to sign this sheet...* "
  - Read and have participants sign the participation/anonymity agreement form.

  2. Ice-breaker (10 minutes)

  Objective: To create a connection between participants and create a conducive atmosphere for exchange. "Few people know that..." Instructions: Participants should introduce themselves and say something that "few people know." The facilitator starts and gives a de-stigmatizing example for the participants (e.g., "Few people know that I knit").

  3. Activities (60 minutes)

  Introductory questions:

  - Why did you come?
  - Has anyone ever talked to you about training at Pôle Emploi?

  Objective: To identify the representations associated with training at Pôle Emploi.

Activity 1: The Man on the Moon (20 min: 5' of instructions + group formation, 5' of reflection, 10' of exchange).

Objective: An easy exercise to put participants at ease and get them talking.

Instructions: "Imagine I am a Man on the Moon, and I have just arrived on Earth. You are the first humans I have encountered, and I approach you and ask, 'What is training at Pôle Emploi?'"

Activity 2: Photo Language (20 min: 5' of instructions and image selection, 15' of exchange)

Objective: To identify the positive and negative representations associated with training to detect the levers and barriers to enrolling in training.

Instructions: "What I think when my advisor talks to me about long-term collective training (+300h)." Participants choose an image in front of them. Then, in turn, they explain how this image makes them think of long-term training.

Activity 3: The Expert (20 minutes)

Objective: To identify the levers that would increase the likelihood of enrolling in training.

Instructions: "In your opinion, what prevents people from enrolling in long-term collective training (excluding material difficulties)?"

4. Conclusion and thanks (10 minutes)

"*Our workshop is coming to an end. Before we leave, would you like to tell us anything else? (...) We sincerely thank you all for your participation in our workshop. Your responses have helped us better understand the reality of training and career paths at Pôle Emploi. Before you go, we just want you to give us some information about yourself, like your age.*" Individually ask participants before they leave to collect: their gender, their age, and whether they have ever enrolled in long-term collective training.

- **Individual Interviews Protocol**

  1. Setting the framework (10 minutes):

  - Welcome: Good morning/afternoon, my name is XX, what is your name? Please come in, welcome.
  - Thanking: Thank you for accepting to come today.
  - Stating the objective: Do you know what we would like to talk to you about? (...) What I would like to know is what you think about training programs. I work for a company external to Pôle Emploi. My goal is to understand what is happening here in relation to training programs. There is no right or wrong answer, we are interested in your opinion.
  - Explaining the confidential and anonymous nature of the interview: Everything you tell us will remain confidential and anonymous. We will never know who said something: we interview many volunteers.
  - Having the participant sign the informed consent form.

  2. Starting the interview (15 minutes):

  - Before we begin, can you tell me a little about yourself? (age, projects, etc.)
  - Any questions before we start?
  - In your opinion, what is the purpose of a certified or qualified training program?
  - What would motivate you to attend a training program (excluding compensation)?
  - If you were to attend a training program, what would make you happy?
  - What would make you unhappy?
  - For what reasons would you refuse to attend a training program (excluding material constraints such as compensation, schedule, mobility, etc.)?
  - And for others?
  - What would make you afraid to attend/return to training?
  - And for others?
  - In what cases do we do it, in what cases do we not, what are the undesirable effects?

Measures

- Growth mindset of intelligence
  - Je pense que je peux développer de nouvelles compétences avec le temps.
  - Je pense qu'il me sera difficile de développer de nouvelles compétences.
  - Quels que soient les métiers, je pense que je suis capable d'y développer de nouvelles compétences.
  - Personnellement, je ne suis pas sûr(e) de pouvoir développer mes compétences.
  - Pour être honnête, il n'est pas facile pour moi de développer de nouvelles compétences.
  - La compétence est surtout une question de don qu'on a ou qu'on n'a pas.
  - Je crois que je peux toujours développer de nouvelles compétences.
  - Pour moi, il n'est pas facile de développer de nouvelles compétences.
  - Avec assez temps et d'efforts, je pense que je pourrai développer de nouvelles compétences.
- Growth mindset of interest
  - Même si j'ai une préfèrence pour un certain métier, je pense que je peux m'intéresser à d'autres métiers aussi.
  - Même si on me fait découvrir des nouveaux métiers, je pense que ça ne changera pas vraiment ce qui m'intéresse.
  - Il y a des métiers qui m'attirent peu au départ mais qui, après tout, pourraient m'intéresser.
  - Pour être honnête, les métiers qui m'intéressent resteront les mêmes. Je pense que ça ne changera pas vraiment.
- Satisfaction
  - La réunion d'aujourd'hui est utile pour moi.
  - J'ai apprécié la première partie de la réunion d'aujourd'hui.
  - J'ai apprécié la seconde partie de la réunion d'aujourd'hui.
- Intention to register
  - J'ai l'intention de m'inscrire en formation.

Procotol of the Pilot Study

Job Seekers Intervention Protocol	
Sequences	Activities
Introduction and trust-building exercises	Introduction of the participants: Our challenge: find a total of ten common points! In a circle, introduce yourself one by one. "My name is..." "Among the things I like in life, there is..." If you have one or more common points with that person, take a step forward.
Creating an expectation : Why would I want to participate in a training ?	“Have you ever had the opportunity to participate in training courses with Pôle Emploi?” “Personally, what you could&éa² expect from a training is to be able to...” “According to you, what can be the most motivating factor during a training program is...” “In one word, if I managed to complete and succeed in a training, I think I would feel...” The numbers game: A fun little exercise to prepare for training. In silence, let's try to memorize as many numbers as possible in order! Numbers appeared and disappeared on the screen, and individuals were instructed to try to remember the highest number of digits. “Finally, how many numbers can we usually remember in order?” “How many numbers do you think you could remember in order with practice?”
Diving into a story to ease the message delivery	Introduction of the thriller miniseries called “Call For Action” and presentation of its teaser (1’10). Written, produced and directed with an international team, Call For Action is a Netflix-standard thriller series created by Korda & Company. The concept: Dorian Bonham is in charge of the secret operations of a defense agency affiliated with the UN. In the event of a mission failure, he has access to technology that sends him back in time and offers him a second chance to change the course of history. It is worth noting that the series was fully dubbed in French to facilitate participants' comprehension. Introduction of the main characters. Call For Action, episodes 1 (4’26), 2 (6’01) and 3 (3’45). After each episode, a quick debriefing through a game: The human chain, take turns telling a part of the story.

Encouraging a growth mindset	In the miniseries, one of the main characters said, ``Whatever you do for a living, all of us have the power to develop and grow our own abilities". Presentation of a popular science video: “We all have the ability to make progress”. (7’16). “Saying is believing” exercise: in pairs, participants share their experience about an activity that was initially difficult for them but in which they persevered and improved in pairs. Video of an expert in learning sciences (3’37): Facing the camera, an expert (i.e., the president of the experimenter’s company) explains the principles of brain plasticity: when you learn something new, your brain gets bigger, more efficient and more powerful. Participants briefly share what they found interesting in the video. “Saying is believing” exercise: In pairs, participants share their experience of an activity they initially lacked interest in but eventually grew to enjoy.
Taking action	Finishing the story: “What you want Celeste to do first is to bring Dorian to...” Call For Action fourth and final episode (5’10). “One thing I really liked about this story is...” “Following these discussions, what I am thinking for my professional project is...” Moving forward with one's professional project sometimes means undergoing training! Let's take a moment to prepare for it. Presentation of a WOOP video designed specifically for this population (3’). It begins with “First, imagine that you have the opportunity to participate in a training: your application has been accepted. Imagine that your training starts today”. Then, the WOOP method consists of four steps. First, individuals identify a wish that is challenging but possible to fulfill. Second, they pinpoint the best outcome in seeking to fulfill their wish. Third, they identify internal obstacles that prevent them from fulfilling their wish (e.g., a particular emotion or habit). Finally, they make an if-then plan by thinking about what they can do to overcome the obstacle (i.e., ``If..., then, I will...").
Conclusion	Round table: “And what I will remember from this first part of the workshop is mainly...”

General Conclusion

Overall, this thesis contributes to the literature in behavioral science by examining the influence of mindsets on various workplace behaviors, including feedback-seeking behaviors, humility, proactivity, delegation, and willingness to learn. The findings from the studies conducted in this thesis provide valuable insights into the role of mindsets in organizational behaviors and shed light on the potential and limits of mindset interventions in promoting positive outcomes in the workplace.

Chapter 1 contributes to the literature by showing correlations between a growth mindset and feedback-seeking behaviors (Study 1), indicating that individuals with a stronger growth mindset are more likely to seek feedback and perceive it as useful and adequate. However, the experimental induction of a growth mindset did not lead to increased feedback-seeking behaviors, and in fact, feedback seeking and feedback environment scores appeared to decrease among those in the treatment condition. The follow-up questionnaires administered three months after the treatment also showed no difference in the amount of feedback sought and given between the control and treatment conditions. Similarly, in Study 2, correlations between a growth mindset and intellectual humility were replicated. However, the experimental induction of a growth mindset did not result in increased humility expressed by managers, and humility scores were rated lower after treatment than before. As a result, the planned mediation model could not be tested as expected.

On the one hand, these results highlight the role played by a growth mindset in organizations when considering feedback-seeking and expressed humility. On the other hand, these findings underscore the importance of examining the context in which mindset interventions are deployed, as previous research has demonstrated that the effectiveness of this kind of interventions hinges on the environmental factors that foster effort and encourage the pursuit of challenges (Walton and Yeager, 2020).

Chapter 2 contributes to the literature by examining how a proactive growth mindset (i.e., the belief that proactivity can be developed), and a delegation growth mindset (i.e., the belief that proactivity is an ability that can be enhanced) influence workplace behaviors. Results showed that at the the more one believes that proactivity can be developed, the more likely one is to think that proactive behaviors are good and to feel capable of being proactive. Moreover, the more one believes that delegation can be developed, the more likely one is to feel capable of

delegating, the more likely one is to delegate and the more likely one is to think that delegation is a good thing. In addition, the results show that a proactive mindset mediates the positive relationship between perceived delegation and proactive self-efficacy, that is, the positive relation between the perception that one's manager is delegating and the sense of being able to be proactive is partially explained by having a proactive mindset. However, the two mindset interventions designed to increase growth mindsets of proactivity and delegation did not result in any significant changes.

As the results of Chapter 1, the findings of Chapter 2 emphasize the influence of having a fixed or growth mindsets in workplace behaviors, such as proactivity and delegation self-efficacies, attitudes, and behaviors. However, the interventions were neither unsuccessful, suggesting the need to systematically explore the contexts in which interventions are implemented, as well as the need for testing new mindst interventions materials in controlled trials.

Chapter 3 is bifurcated into two sections. The initial section contributes to the literature by scrutinizing training programs that have undergone rigorous testing for the past thirty years to enhance reemployment opportunities for individuals who are unemployed. The vast majority of the 29 articles reviewed in the literature review were ALMPs and were long in duration (i.e., a few months long). On the contrary, one intervention that showed significant results in terms of employment outcome is a learning-goal intervention (Noordzij et al., 2013). Although not labeled as mindset interventions, this intervention targeted job seekers' situational learning goal orientation, which is related to growth mindset theory, suggesting the relevance of studying brief mindset interventions among unemployed individuals. In the latter section of this chapter, a pilot study is introduced that outlines the development of a short mindset intervention aimed at improving the readiness of unemployed individuals to learn but results were inconclusive.

Results of Chapter 3 stress the importance of implementing mindset interventions among understudied populations, such as job seekers. s. If mindset interventions prove successful, it could encourage job seekers to participate in training programs and boost their belief in their ability to find a job, and would have important implications for reducing unemployment. Notably, the literature review revealed that programs lasting longer than three months are more effective than shorter ones. However, mindset interventions could be a useful tool for policymakers due to their short duration (around one hour) and ease of deployment (through videos conveying key messages and protocols).

In conclusion, this thesis contributes to our understanding of the impact of mindsets on behaviors in the world of work and highlights the need for further research to fully comprehend the potential and limits of mindset interventions in promoting positive outcomes in organizational settings. The findings of this thesis have practical implications for organizations and practitioners seeking to leverage mindset interventions as a tool for promoting desired behaviors in the workplace, and further research in this area can continue to enhance our understanding of this important topic.

An interesting avenue for future research would be to explore the potential interaction between mindset interventions and environmental factors, such as the feedback environment or the

managerial style. Additionally, it would be valuable to investigate how mindset interventions could be integrated into existing training programs or workplace interventions to optimize their effectiveness. Overall, this thesis underscores the importance of understanding the role of mindsets in organizational behaviors and the potential of mindset interventions to promote positive outcomes in the workplace.

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Résumé substantiel de la thèse

Cette thèse vise à enrichir la littérature en sciences comportementales en examinant l'influence des théories implicites, ou "états d'esprit", sur les comportements professionnels. Ces croyances sur la malléabilité des attributs individuels ont été étudiées à travers leur impact sur cinq dimensions clés des comportements organisationnels : la recherche de feedback, l'humilité intellectuelle, la proactivité, la délégation et la volonté d'apprendre. Trois chapitres, basés sur des études empiriques, abordent ces dimensions sous différents angles méthodologiques.

Le premier chapitre explore la relation entre un état d'esprit de croissance lié à l'intelligence (croyance selon laquelle les compétences peuvent être développées) et les comportements de recherche de feedback. Une attention particulière est portée à l'humilité intellectuelle des managers comme facteur médiateur dans cette relation.

Deux études de terrain ont été menées au sein d'une grande banque française. Dans ces études, 345 employés et leurs managers ont été répartis aléatoirement en deux groupes : un groupe d'intervention et un groupe contrôle. L'intervention consistait en un atelier sur l'état d'esprit de croissance suivi d'une formation sur le feedback, visant à démontrer que les capacités intellectuelles et les compétences peuvent être développées par l'effort et la pratique. Les comportements de recherche de feedback et l'humilité intellectuelle ont été mesurés avant, immédiatement après et trois mois après l'intervention à l'aide de questionnaires structurés.

Les résultats montrent une corrélation positive entre un état d'esprit de croissance et les comportements déclarés de recherche de feedback. Toutefois, l'intervention n'a pas produit d'effet significatif sur les comportements observés ni sur l'humilité intellectuelle des managers. Ces travaux mettent en lumière les défis liés à l'implémentation d'interventions basées sur les états d'esprit dans des contextes professionnels structurés.

Le deuxième chapitre examine comment les croyances sur la malléabilité de la proactivité et de la délégation influencent les comportements des employés et des managers. Ces croyances sont désignées respectivement comme "états d'esprit proactif" et "états d'esprit de délégation". L'étude vise également à tester l'efficacité de deux interventions distinctes pour promouvoir ces états d'esprit.

Cette étude a été menée dans une entreprise française de gestion de la santé, impliquant 388 employés issus du département des opérations. Les participants ont été répartis en deux groupes. Les employés du groupe d'intervention ont participé à deux ateliers distincts : le premier, intitulé "Reboot : Initiative", visait à promouvoir un état

d’esprit de croissance lié à la proactivité à travers des vidéos éducatives, des exercices interactifs et des activités de réflexion. Le second atelier, "Reboot : Team Builder", destiné uniquement aux managers, avait pour objectif de renforcer leur capacité à déléguer en mettant en évidence les bénéfices de l’autonomie et de la confiance dans leurs équipes.

Les résultats montrent que les états d’esprit de croissance liés à la proactivité et à la délégation sont corrélés positivement à l’auto-efficacité déclarée et à des attitudes favorables envers ces pratiques. Toutefois, l’impact direct des interventions sur les comportements mesurés reste limité. Ces résultats soulignent l’importance d’un contexte organisationnel favorable pour maximiser l’effet des interventions et encourager une mise en pratique durable.

Le troisième chapitre explore l’efficacité des interventions basées sur les états d’esprit pour accroître la volonté d’apprendre des demandeurs d’emploi. Cette recherche vise à répondre à des défis spécifiques liés au chômage, notamment le manque de motivation pour suivre des formations et la perception d’un faible contrôle sur ses opportunités d’emploi.

Ce chapitre démarre par une revue de la littérature ayant pour objectif d’analyser les programmes de formation existants destinés aux demandeurs d’emploi, notamment ceux visant à renforcer leur employabilité et leur retour à l’emploi. Les études passées mettent en évidence que les demandeurs d’emploi rencontrent des obstacles importants, tels que des compétences obsolètes, un manque de confiance en soi et une faible motivation à suivre des formations. Les approches traditionnelles, bien qu’efficaces dans certains cas, se révèlent souvent coûteuses ou insuffisantes pour produire des changements durables. La littérature met également en évidence que les états d’esprit de croissance, notamment ceux liés à l’intelligence et à l’apprentissage, jouent un rôle crucial dans la persévérance face aux obstacles et l’engagement dans des démarches de développement personnel.

Aussi, ce dernier chapitre présente également une étude pilote réalisée en partenariat avec Pôle Emploi, impliquant un échantillon de 337 demandeurs d’emploi. Les participants ont été répartis en deux groupes : un groupe ayant reçu une intervention axée sur l’état d’esprit de croissance (mindset intervention), et un groupe contrôle. L’intervention, d’une durée de 90 minutes, comprenait une présentation vidéo sur la malléabilité de l’intelligence et des exercices de réflexion basés sur la méthode WOOP (Wish, Outcome, Obstacle, Plan), destinée à aider les participants à établir des objectifs et à surmonter leurs obstacles personnels.

Les résultats, bien que non concluants, montrent une tendance positive dans les attitudes des individus bénéficiaires de la mindset intervention envers la formation et

l’apprentissage. Ces travaux mettent en avant le potentiel des interventions basées sur les états d’esprit pour encourager l’apprentissage continu et réduire les obstacles à l’emploi, tout en appelant à une plus grande rigueur méthodologique dans les recherches futures.

Les résultats de cette thèse apportent des contributions significatives à la compréhension des états d’esprit en milieu professionnel et à leur potentiel pour influencer des comportements clés. Cependant, les études révèlent également les limites des interventions actuelles, qui nécessitent des ajustements pour surmonter les contraintes contextuelles. La culture organisationnelle, le soutien managérial et l’engagement des participants apparaissent comme des leviers essentiels pour maximiser l’impact de ces approches.

Ces travaux offrent une base solide pour développer des interventions plus ciblées et adaptées aux spécificités des différents contextes professionnels. Ils ouvrent également des perspectives prometteuses pour des politiques publiques visant à améliorer la performance individuelle et collective, notamment dans les domaines de l’apprentissage, de la gestion des talents et de la réduction du chômage.