MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

„Growth Mindsets and Extraversion at Work"

verfasst von / submitted by

Florian Wagner BSc

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien, 2022 / Vienna 2022

Table of Contents

Growth Mindsets and Extraversion at Work

As the corona-pandemic slowly approaches its end or at least gets under some control, various countries are calling out so-called "Freedom Days" and are abolishing social distancing policies once again (Eder, 2022). Also more and more employees are returning from home-office, even if this kind of flexible work form will very likely leave it's mark in today's world of work (Flüter-Hoffmann & Stettes, 2022). This return probably makes extraverted employees very happy, as their productivity, satisfaction, and engagement was under bad circumstances during periods of remote work (Evans et al., 2021). Additionally, a study found that extraverts missed their colleagues more than introverts (Langvik et al., 2021).

Extraverted people are associated with sociability, dominance, excitement seeking, positive emotions, and talkativeness in contrast to introverted people (Wilmot et al., 2019). At the same time, introversion is somewhat seen as something negative (Blevins et al., 2022) and "as a limitation in need of accommodation" in today's world of work (Wilmot et al., 2019, p. 1447). One can find articles like "25 Tips To Be More Extraverted (Without Losing Who You Are)" in the world wide web, as "[l]ots of social situations are easier for people who are extroverts." (Sander, 2019). Another article describes "18 Ways To Be More Extroverted at Work", in order to be more successful (Indeed Editorial Team, 2021). There are also leadership trainings to develop the Big-5 personality dimensions in order to be a better leader in the digital age (Kasper, 2019). So, is there some evidence in favor of the allegedly superior role of extraversion at today's workplace?

A meta-analysis by Wilmot et al. (2019), including over 100 studies, showed that there are motivational, interpersonal, emotional, and performance-related advantages of extraverted people at work. Many other studies tell the same story about benefits at work (e. g. Gensowski, 2018; Hudson & Fraley, 2016a; Judge et al., 2002; Langvik et al., 2021, 2021; Margolis & Lyubomirsky, 2020), job satisfaction (e. g. Seibert & Kraimer, 2001), and well-being in general (e. g. Hudson & Fraley, 2016a; Margolis & Lyubomirsky, 2020; Steel et al., 2008). So, can people change their personality in order to enjoy these advantages?

All traits are per definition pretty stable, which means that they do not change a lot (Anusic & Schimmack, 2016; Thielmann & de Vries, 2021), but there is some range for change (e.g. Haan et al., 1986; Roberts et al., 2006; Thielmann & de Vries, 2021). Also most people want to change (Baranski et al., 2017), especially in the direction of social desirability, like having a higher level of extraversion (Hudson, Briley, et al., 2019; Hudson & Fraley, 2016b; Stieger et al., 2021). If people have set themselves the goal of personality change,

they are more likely to change (Hudson et al., 2021; Hudson, Fraley, et al., 2020; Stieger et al., 2021). The change goal of a trait is also dependent on life satisfaction (Hudson & Roberts, 2014) and the existing level of the trait (Baranski et al., 2017; Hudson & Fraley, 2016b, p. 201; Hudson & Roberts, 2014; Thielmann & de Vries, 2021). Change goals are also positively related to the assumption about the changeability of the specific trait (Hudson et al., 2021). These mindsets of personality deal with the potential to change personal characteristics (Yeager et al., 2013). A fixed mindset is the belief that attributes are not changeable and a growth mindset is the belief that attributes can be changed (Bernecker & Job, 2019). Even if Hudson et al. (2021) found no increase in extraversion, if a growth mindset and a change goal of extraversion was given, previous studies showed that growth mindset interventions can change personality facets (Erdley et al., 1997; Kammrath & Dweck, 2006; Schleider & Weisz, 2018). Furthermore, there is a lack of short interventions (e. g. Schleider & Weisz, 2018). For this reason, very brief fixed and growth mindset interventions, emphasizing the positive effects of extraversion, are implemented in order to investigate the effect on the change goal of extraversion. Furthermore, Heslin et al. (2019, p. 2118) proposed: "In situations that cue extraversion, those who are low in extraversion exhibit more extraverted behavior when they hold more of a growth mindset than fixed mindset."

As this question is not yet experimentally researched, the present work deals with the relation between the mindset of extraversion, change goals of extraversion in a social setting, and extraversion itself in the context of today's world of work. The results can be used especially for jobs that require prototypical extraverted behavior in order to increase job fit, by using growth mindset interventions.

Theory and Hypothesis

Extraversion

The six so-called facets of extraversion are activity, assertiveness, excitement seeking, gregariousness, positive emotion and warmth (Costa & McCrae, 1992). Extraverts are also more talkative, dominant and sociable (Ostendorf & Angleitner, 2003; Wilmot et al., 2019). Moreover, they show more approach tendencies, boldness, and status motivation (Lukaszewski, 2016). According to various researchers, introversion should not be seen as the opposite of extraversion, but as the lack of extraversion (Neyer & Asendorpf, 2012; Ostendorf & Angleitner, 2003). Related behavior traits of introversion are submissiveness, negative emotionality, inconspicuousness, avoidance tendencies, and shyness (Lukaszewski, 2016). Jung (1990) originally described the terms of being drawn to the external world, the

object, which extraversion represents, or being drawn to the inner world, the subject, which introversion represents. Next to extraversion, four other personality dimensions are described. The so-called Big-5 consist also of openness to experience, agreeableness, neuroticism, and conscientiousness (Costa & McCrae, 1985; Goldberg, 1981). Looking at genetic factors, although extraversion has a heritability slightly higher than the average heritability of the Big-5 $h^2 = .40$, this means that the environment has an impact on the extraversion level (Vukasović & Bratko, 2015).

The meta-analysis by Wilmot et al. (2019), including over 100 studies, showed that there are many advantages of extraverted people at work, namely motivational, interpersonal, emotional, and performance-related ones. Even if this meta-analysis is limited by not considering different demands of skills and personality at different workplaces, possible nonlinear relations between extraversion and dependent variables, changes over lifetime, and intrapersonal variability of extraverted behavior in various situations, there is a growing body of evidence that shows advantages of extraversion at work (e.g. Gensowski, 2018; Judge et al., 2002; Langvik et al., 2021). Extraverts show more organizational citizenship behavior (Hudson et al., 2012), they are more often successful at work (Judge et al., 1999), and leaders at work (Judge et al., 2002; Seibert & Kraimer, 2001). Being extraverted also correlates positively with promotion (Seibert & Kraimer, 2001) and leadership effectiveness (Judge et al., 2002). Additionally, especially agency, which is described as a part of extraversion, boosts leadership performance (Do & Minbashian, 2014). Besides a positive relation between work involvement and extraversion, change in work involvement and change in extraversion are also related in a positive manner (Hudson et al., 2012; Wille et al., 2014). Regarding interpersonal advantages, (Langvik et al., 2021) found that extraverted, Norwegian policemen and policewomen met more colleagues outside of work during the corona-pandemic than their introverted colleagues.

Summarized by Wilmot et al. (2019), various scientific studies showed that extraverts are probably more motivated by rewards at work (Depue & Collins, 1999; McCabe & Fleeson, 2012), especially those that address status, competition, and accomplishment (Barrick et al., 2002, 2013; McCabe & Fleeson, 2012). This could also be an explanation for the lowered well-being and performance of extraverts working in home-office (Evans et al., 2021). As home-office does not give much chance to depict accomplishment and status like a face-to-face office context, motivation and subsequently the performance could suffer as a result.

A study by Fletcher (2013) also showed a relationship between extraversion and employment, namely a two percent higher chance for employment per standard deviation higher in extraversion. The same study showed that one standard deviation higher in extraversion is related to 5-6% more earnings, which means around 2.000 US$ a year in this sample. A study by O'Connell and Sheikh (2011) solidified these results. Seibert & Kraimer (2001) found a general positive relation with salary. Another study found that only extraverted males earn more money over a lifetime than introverted ones (Gensowski, 2018). Some studies also found downsides of extraversion regarding wage especially for women (Heineck & Anger, 2010; Nyhus & Pons, 2005). A general point of critique is that research primarily uses negatively connotated items to measure introversion and neglects the possible benefits of introversion at work, by for example researching work contexts especially favored by extraverts (Blevins et al., 2022).

It seems also of importance to consider the role of extraversion with job fit. In the field of a changing and dynamic workplace, that is nursing, Wihler et al. (2017) found out that extraversion leads to high adaptive performance, when social competency is high and a climate for personal initiative is given. Barrick et al. (2002) conducted a study on a sample of salespeople, which showed that seeking for status and accomplishment mediates the relation between extraversion and higher sales performance. As this job is naturally more fitting for extraverts, just like managerial positions and other jobs with constant interpersonal interactions (Barrick et al., 2013; Heslin et al., 2019), job fit has to be kept in mind, when implementing personal development interventions.

These study results are based on *trait activation theory* (TAT; Tett & Burnett, 2003; Tett & Guterman, 2000), which says that trait-related behavior is shown, especially when there are moderate trait-relevant situational cues. The chance to show behavior prototypical for the own trait is also accompanied by positive affect (Barrick et al., 2013). This is also backed up by a study by Chi et al. (2012). The authors found that introverts got less tips in customer service and more emotionally exhausted when using surface acting (no real emotions) in comparison to extraverts. When using deep acting (real emotions), there was no difference between the two in emotional exhaustion. Other typical situations that cue extraversion, are for example employee coaching and team meetings (Heslin et al., 2019). In accordance with TAT (Tett & Burnett, 2003), strong cues tend to dissolve typical behavior (Mischel, 1973). When somebody is in the strong or extreme situation of being fired, for example, personality differences will not have a strong effect, as most people will try to keep their job (Heslin et al., 2019).

Looking over the boundaries of the working world, a meta-analysis by Steel et al. (2008) showed a positive correlation between extraversion and well-being. Also people who changed in the direction of extraversion show higher well-being, especially those who wanted to change their extraversion (Hudson & Fraley, 2016a). In line with these results, a recent study manipulated the extraversion level of people significantly by making them show extraverted or introverted behavior (Margolis & Lyubomirsky, 2020). People in the extraversion group showed higher well-being and the ones in the introversion group lower well-being. Similarly, this relation is also given between extraversion and job satisfaction (Scollon & Diener, 2006; Wille et al., 2014), as extraverts tend to create more positive relationships and social capital at work (Seibert & Kraimer, 2001). A positive change in extraversion can also predict higher self-related health and is also negatively related to work reduction because of physical health issues (Turiano et al., 2012).

When researching and discussing traits, it is important to monitor the relation between definition and outcome. Extraversion is associated with life satisfaction (Herringer, 1998), neurobiologically correlated with positive emotions (Depue & Collins, 1999), and its manipulation leads to higher well-being (Margolis & Lyubomirsky, 2020), but extraversion itself is also defined by positive emotions (Ostendorf & Angleitner, 2003). To clarify some of the terms, well-being consists of absence of negative affect, positive affect, and a high life satisfaction (Diener et al., 1999; Diener & Emmons, 1984; Margolis & Lyubomirsky, 2020). Referring to this, life satisfaction is a part of well-being. People who experience low life satisfaction also want to increase extraversion with a higher chance (Hudson & Roberts, 2014). According to the authors, this is also true for sex lives, finances, friendships, recreational activities, daily emotions, and religion. Of the six facets of extraversion, especially positive emotions and assertiveness are related with life satisfaction (Herringer, 1998). Hence, a higher level of extraversion would help to be more satisfied with life (Hudson & Roberts, 2014). Here, research runs the risk of measuring facets of extraversion as the outcome of extraversion. This has to be kept in mind when researching the relation between extraversion and constructs that are also related to or even defined by positive emotions.

Nevertheless, these results show the advantages of extraversion not only in the world of work. However, is it possible for someone to simply get more extraverted to be more satisfied and more successful?

Personality Change

Even if personality is per definition stable (Anusic & Schimmack, 2016) and the personality dimensions are rather rank-order consistent over time (Roberts et al., 2006), there is some range for change (e. g. Haan et al., 1986; Roberts et al., 2006; Thielmann & de Vries, 2021). In general, personality dimensions like extraversion are less stable compared to intelligence (Heise, 1969). Biological or genetic factors and environmental factors like life events and normative roles and tasks, of which many occur during young adulthood (Bleidorn et al., 2018; Helson et al., 2002; Neyer & Asendorpf, 2001), are the driving force of this change (McCrae et al., 2000; Roberts et al., 2006). Normative change is given when many people change the same way in the same period of life (Roberts et al., 2006). For example, many young adults who engage in a romantic relationship get emotionally more stable, conscientious and extraverted (Bleidorn et al., 2018; Lehnart et al., 2010; Neyer & Asendorpf, 2001). Also beginning to work, which often occurs during young adulthood (Roberts & Wood, 2014), and increasing social investment in a career may increase conscientiousness (Hudson et al., 2012; Hudson & Roberts, 2016). Generally, adults' personalities increase in emotional stability, agreeableness, and conscientiousness (Roberts et al., 2006), as the same traits are especially changed by fulfilling social roles (e. g. Lodi-Smith & Roberts, 2007). Generally, experiences with a strong emotional and social (behavioral) impact should trigger change in extraversion, agreeableness and neuroticism (Bleidorn et al., 2018). Openness and conscientiousness should be more triggered by behavioral and cognitive content like work (Bleidorn et al., 2018).

The reasons for stability and change of personality are included in an integrative model proposed by Wagner et al. (2020), which differentiates between internal and external reasons. According to the authors, the internal factors are the genome, biological processes, traits, habits, and states. The internal and external factors, which are for example culture, social roles, and family, influence each other, leading to changeability or stability. A similar, but more process-orientated categorization is made by Fraley & Roberts (2005). According to the authors, three mechanisms are responsible for development processes of personality, namely, stochastic mechanisms, person-environment transactional mechanisms, and developmental constancy factors, of which the latter deal with genetics and biological effects. The stochastic mechanisms deal with the likeliness of carrying over a behavior from one situation to another especially in times of contextual change. Person-environment transactional mechanisms deal with vice-versa effects of personality and the environment (Fraley & Roberts, 2005). Caspi et al., (1989) discuss several ways of how this particular

mechanism works. People can select situations proactively in line with their personality, which in turn strengthens their own image of having that particular personality trait (Fraley & Roberts, 2005) and leads to positive affect (Barrick et al., 2013). Extraverted people, for example, will select social situations more often and see themselves as more extraverted because of selecting such situations (Fraley & Roberts, 2005). The reactive way of the transactional mechanism would be an insecure person interpreting many situations as insecure situations, which in return solidifies their insecurity (Fraley & Roberts, 2005). The evocative way of the mechanism deals with evoking reactions from other people that strengthen the own personality (Fraley & Roberts, 2005). This is well described with the famous saying: "As one calls in the woods, so it echoes back.". So, how does extraversion change exactly over a lifetime? To answer this question, a more differentiated view is needed.

Regarding stability, extraversion levels moderately correlate across various measurement instruments (Pace & Brannick, 2010) and also across different points in time (Roberts & DelVecchio, 2000). There is a decrease from late childhood to adolescence, especially for men, and rather flat trends through adolescence and adulthood (Soto et al., 2011). Other studies, however, report a decrease from 18 to 30, only small changes after that and an overall negative correlation with age (McCrae et al., 2000) and a significant decrease concerning women and increase concerning men from 31 to 60 (Srivastava et al., 2003). Moreover studies report stabilization during adulthood (Roberts et al., 2006), and stability and later decline in extraversion from 30 to 90 (Terracciano et al., 2005). Hudson and Fraley (2016) found a general slight increase from 20 to 70, with a slight decrease at an older age. According to Soto et al. (2011) the mixed results of previous studies are probably due to only small changes overall. Research showed that mean changes in extraversion over a lifetime are probably smaller than one standard deviation (McCrae et al., 2000; Soto et al., 2011; Terracciano et al., 2005). It is conceivable that these results are also due to samples in different countries and cultures, with different jobs, and different experiences made.

It could be, that the solution lies within the construct. One can also categorize the six facets of extraversion into two main categories: Social dominance and social vitality (Helson et al., 2002). Social dominance increases especially from age 20 to 40, as do conscientiousness and emotional stability (Helson et al., 2002; Roberts et al., 2006). In adolescence, social vitality and openness increase and stabilize only to decrease later in old age (Helson et al., 2002; Roberts et al., 2006). Making a similar categorization, Soto et al. (2011) looked at the difference in change of the two facets activity and assertiveness. They found a downwards trend from late childhood (especially from childhood to adolescence) to

emerging adulthood in activity, which is also backed up by Terracciano et al. (2005). Assertiveness also decreased, but in a subdivided manner with a stronger decrease concerning men than women. Contrary to this, Soto et al. (2011) found an increase followed by a decrease in assertiveness from 30 to 90 with no significant difference between men and women. All changes in the study by Soto et al. (2011) were smaller than one standard deviation. However, also when looking at facets of extraversion, there are mixed results of previous studies.

All in all, extraversion changes to some degree in life because of biological and environmental circumstances (McCrae et al., 2000; Roberts et al., 2006). As there are mixed results on how extraversion changes, this is maybe due to extraversion facets changing in different ways (Helson et al., 2002; Roberts et al., 2006; Soto et al., 2011). The magnitude of change over a lifetime is limited, as most mean change is smaller than one standard deviation (McCrae et al., 2000; Soto et al., 2011; Terracciano et al., 2005). Are people, who want to change their extraversion, actually able to change it in the desired direction? Do people even want to change their personality?

Change Goals

A study by Baranski et al. (2017) showed that most people, namely 67.5%, want to change their personality. Possibly, the percentage is even higher, as around 78% of the people want to increase their Big-5 in the direction of social desirability, but this relation gets weaker with age (Hudson & Fraley, 2016b). Regarding extraversion, 87% of college students want to increase their extraversion and 10% want to stay at their level (Hudson & Roberts, 2014).

Self-regulated, individual desires to change a trait are called change goals of personality (Hennecke et al., 2014; Thielmann & de Vries, 2021). These volitional change goals have influence on the change of personality (Hudson, Briley, et al., 2019; Hudson, Fraley, et al., 2020; Hudson & Fraley, 2015, 2016a). Most importantly, people who want to change their extraversion, emotional stability and conscientiousness can change the corresponding traits in the desired way over time (Hudson et al., 2021). Also change goals regarding the decrease of attachment anxiety and avoidance can lead to desired effects within weeks (Hudson, Chopik, et al., 2020). Hudson and Fraley (2017) summarize their previous study results regarding the Big-5 (Hudson & Fraley, 2015, 2016a) and show that the level of change in the intended direction was moderate and smaller than one standard deviation in four months. In contrast, there are also studies that did not show similar results (Baranski et al., 2020; Robinson et al., 2015). In one study, people with goals to increase emotional stability and conscientiousness decreased in the corresponding trait over a 12-month period

(Robinson et al., 2015). Baranski et al. (2020) found the same pattern for conscientiousness, extraversion and agreeableness. Baranski et al. (2020) and Robinson et al. (2015) both explained this by a disadvantage of having a low level of a trait and thus, especially high change goals that cannot be reached.

So, what can people do if they want to boost their level of extraversion? People who want to change their extraversion use more behavioral strategies than cognitive ones, in comparison to people who want to change their agreeableness (Baranski et al., 2017). Behavioral strategies also work, according to the results found in the studies by Margolis and Lyubomirsky (2020) and Hudson & Fraley (2015). Generally speaking, coaching, counseling, therapy, and self-help groups can lead to wanted effects (Allemand & Flückiger, 2017). Allan et al. (2018) showed that it is possible to change personality (including extraversion) over the course of 10 weeks using a coaching program with effects lasting for three months. A follow-up study indicated that the effects even lasted for four years (Martin-Allan et al., 2019). Allemand and Flückiger (2017) summarized strategies and mentioned the importance of targeting and altering traits, states and habits using multiple intervention perspectives and change processes, which is also backed up by Bleidorn et al. (2020). Concrete strategies emphasize discrepancy awareness, strengths-orientation, learning orientation, practice and intra- and interindividual perspectives (Allemand & Flückiger, 2017).

Hudson and Fraley (2017) describe experiences that can change personality as "strong, consistent presses that evoke certain state-level patterns of thoughts, feelings, and behaviors". This is also based on previous research (e.g. Hennecke et al., 2014; Magidson et al., 2014). In line with this, Margolis and Lyubomirsky (2020) alternately put people in an extraversion and in an introversion group. Both groups received the instructions to write down five ideas on how to be more "talkative, assertive, and spontaneous [deliberate, quiet, and reserved]" in the next seven days. The extraversion group showed an increase in extraversion and well-being in comparison to the introversion group. These results are supported by other previous studies with similiar manipulation using implementation intentions, which are "if/then" sentences, (Hudson & Fraley, 2015), an app (Stieger et al., 2021) and trait-related behavioral challenges (Hudson, Briley, et al., 2019). Digital-coaching interventions via smartphone offer a good platform, as the effectiveness for change is given (Stieger et al., 2021), and as they are with their owner every time (Allemand & Flückiger, 2022).

So, how does a change goal arise? The change goal of a trait is dependent on life satisfaction (Hudson & Roberts, 2014), the social desirability of the trait (Hudson, Briley, et

al., 2019; Hudson & Roberts, 2014) and the existing level of the trait (Baranski et al., 2017; Hudson & Fraley, 2016b, p. 201; Hudson & Roberts, 2014; Thielmann & de Vries, 2021). Change goals are also positively related to the assumption about the changeability of the trait (Hudson et al., 2021). In order to also gain self-regulated trait changes the trait-related behavior has to be desirable, feasible and has to become habitual (Hennecke et al., 2014), which corresponds to intervention attributes mentioned by Hudson (2021). The motivation for change can be both intrinsic and extrinsic (Hudson & Fraley, 2017).

Every trait of the Big-5 also has a level in social desirability (Dunlop et al., 2012) and people with a low level of extraversion, for example, have a desire to increase the level (Baranski et al., 2017; Hudson & Roberts, 2014). As there is also a relation between life satisfaction and change goals (Hudson & Roberts, 2014), especially people that feel unhappy about their social lives, want to be more extraverted (Hudson & Roberts, 2014).

Regarding the level of a trait, Thielmann and de Vries (2021) showed that there is particularly a negative relation between the level of extraversion, emotional stability, and conscientiousness and a corresponding change goal by analyzing previous studies (Costantini et al., 2020; Hudson & Roberts, 2014). This relation changes when receiving feedback about personality, as for people with high levels of extraversion the change goals of extraversion decreased (Thielmann & de Vries, 2021). The negative relation between change goals of extraversion and level of extraversion is also given when others rate the level of extraversion (Quintus et al., 2017). This could be due to the fact that extraversion manifests itself in social behavior, which could be validly rated by others. Also, the goal of being more extraverted is expressed less frequently if people are successfully increasing their extraversion (Hudson & Fraley, 2015). Another study found a negative relation between resistance to change and extraversion, agreeableness, emotional stability, and openness to experience (Saksvik & Hetland, 2009). Extraversion is also related to behavior regarding change in organizations (Marinova et al., 2015).

Mindsets

People do not only have goals to change their personality (e.g. Baranski et al., 2017), but they also hold a belief about the changeability of personality (Bernecker & Job, 2019). As said, change goals are also positively related to the assumption about the changeability of the trait (Hudson et al., 2021). Change goals of extraversion correlate significantly positive with the assumption about the changeability of extraversion, which is called a growth or a fixed mindset of extraversion (Hudson et al., 2021). Mindsets of personality deal with the potential to change personal characteristics (Yeager et al., 2013), not the likelihood of that change

(Bernecker & Job, 2019). These assumptions that are held about the fundamental changeability of personal attributes, can vary in different domains from a fixed or stable to a growth or dynamic mindset (Dweck, 1986; Dweck 1999). A fixed mindset is the belief that attributes are not changeable and a growth mindset is the belief that attributes can be changed (Bernecker & Job, 2019). These mindsets are also called implicit theories, of which a fixed mindset can also be called an entity theory and a growth mindset can be called an incremental theory (Bernecker & Job, 2019). According to Dweck (2012) 40% of the people have either a fixed or a growth mindset and 20% are somewhere between in the continuum. As said, mindsets can be held about different domains such as personality, intelligence, willpower, moral character, body weight, and health (Bernecker & Job, 2019; Burnette, 2010; Chiu et al., 1997; Hong et al., 1999; Hudson et al., 2021; Job et al., 2010; Schreiber et al., 2020). The mindsets on different attributes can differ from one another, such as one can believe that intelligence is changeable, but personality is not (Bernecker & Job, 2019).

People with a fixed mindset show more interest in proving something than people with a growth mindset, who are more interested in improving themselves (Bernecker & Job, 2019). This is also the reason why people with a fixed mindset are more vulnerable to difficult times and failure (Dweck & Leggett, 1988; Dweck & Yeager, 2019). In that regard, people holding a fixed mindsets also react rather negatively to social exclusion (e. g. Yeager & Dweck, 2012) and blame themselves more often (Erdley et al., 1997). Furthermore, there is also a neurological association between growth mindsets and grit, which is long-term goal perseverance (Myers et al., 2016; Wang et al., 2018). This is in line with the idea that mindsets are related with corresponding goals, a learning goal for growth mindsets and a performance goal for fixed mindsets (Bernecker & Job, 2019). This is also in accordance with the theoretical model by Hudson (2021) that says that self-regulation is also important for personality change interventions, as learning and grit correspond to this ability.

Mindsets probably develop during childhood (Haimovitz & Dweck, 2016). The stability of mindsets are comparable to that of personality traits (Robins & Pals, 2002), but just like traits can be changed (e.g. Hudson et al., 2019), mindsets can be changed (e.g. Yeager et al., 2013). There are long term interventions (Blackwell et al., 2007; Good et al., 2003; Yeager et al., 2013), but also shorter ones (Schleider & Weisz, 2018). A short 30-minute intervention regarding personality showed improvement in depression, anxiety, and behavioral control even 9-months later in a high risk clinical sample (Schleider & Weisz, 2018). Additionally, a growth mindset is associated with greater retrospective personality change (Nick Cochran et al., 2021). This is limited by the fact that in a study by Hudson et al.

(2019) 39% of the people thought their traits changed in the opposite direction of the actual change.

Like extraversion, a growth mindset has advantages in the world of work, as it is related to motivation and resilience (Yeager & Dweck, 2012). This is why growth mindsets play a role in various performance related domains like motivation, determination, negotiation, leadership, appraisals, and employee coaching (Cutumisu et al., 2018; Heslin et al., 2005, 2006; Hoyt et al., 2012; Kray & Haselhuhn, 2007; Zeng et al., 2019). At the same time, Caniëls et al. (2018) found that a growth mindset does not directly enhance work engagement, but indirectly when the person has a proactive personality and when transformational leadership in the organization is high. Mindsets also play a moderating role on the positive relation between job fit and work passion (Chen et al., 2015), as people with a fixed mindset had more extreme self-ratings of passion work, than those with a growth mindset. Also people with fixed mindsets perceived a higher level of starting fit than people with a growth mindset, but both reported similar levels later. Furthermore, a growth mindset intervention can help facilitating work passion (Chen et al., 2021).

A literature review by Han and Stieha (2020) on growth mindsets in human resource development also found that growth mindsets have positive effects on the dyadic level in organizations. This means that growth mindsets for example correlated with improved relationships through coaching and feedback (Gutshall, 2013; Özduran & Tanova, 2017; Rattan & Dweck, 2018; Shapcott & Carr, 2020). Based on previous studies (e. g. Özduran & Tanova, 2017; Shapcott & Carr, 2020) Han and Stieha (2020) concluded that growth mindset education or intervention can foster wanted effects in trainings and coaching.

In a study by Hudson et al. (2021), the growth mindset of extraversion had, like all others of the Big-5, no direct effect on change over 16 weeks. When looking at the change goal of extraversion as a moderator on the relation between growth mindsets of extraversion and extraversion, paradoxically a significant (three-way interaction; goal x mindset x month) but very small negative effect was found. In reaction to that, the authors concluded that the results are maybe representing a sampling error. At the same time, people who do not think, that personality is changeable would not even try to change it, but could change without knowing they had changed (Hudson et al., 2021).

To put these results into perspective, in contrast to theoretical assumptions (Allemand & Flückiger, 2017; Hennecke et al., 2014; Hudson & Fraley, 2017), Hudson et al. (2021) found no evidence that there is greater personality change when a growth mindset and a change goal of personality is given. The authors noted that they used no intervention to

change the mindset. There should be a bigger impact, if the mindset is manipulated, if the thought of changeability or unchangeability is available, and if the importance of the particular personality trait is highlighted. There should also be stronger effects if behaviorally directed items are used to measure change goals, as people who want to change their extraversion especially use behavioral strategies (Baranski et al., 2017). Moreover, several other studies showed that growth mindset interventions are useful to change personality facets (Erdley et al., 1997; Kammrath & Dweck, 2006; Schleider & Weisz, 2018). For example, a growth mindset of personality intervention helped to increase social confidence (Erdley et al., 1997), which relates to extraversion (Hudson et al., 2021). Hudson et al. (2021) only used the personality questionnaire BFI2 by Soto & John (2017) and changed the wording. As previous studies showed that social roles change traits (e. g. Roberts et al., 2006), the work environment could potentially make personality change essential to be successful and that work also is a realistic context for change (Hudson et al., 2021). Furthermore, as extraversion is allegedly related with advantages in the world of work (e. g. Gensowski, 2018; Hudson & Fraley, 2016; Judge et al., 2002; Langvik et al., 2021, 2021), this study deals with the goal of changing extraversion for work.

This study will use a short induction of a growth and a fixed mindset of extraversion. As this also means, that there would be only small to no effects on extraversion level, the change goal of extraversion is the dependent variable in this study. So, a relation between mindset and change goal is expected, which is backed up by previous research as discussed previously (e.g. Hudson et al., 2021; Yeager & Dweck, 2012). The change goal of extraversion itself will be measured by presenting a social and behavioral setting, which not only corresponds to the fact that behavioral strategies work good to change extraversion (e. g. Margolis & Lyubomirsky, 2020), but also stays in line with the realistic context of work.

As the change goal is also dependent on social desirability and trait level (Hudson, Briley, et al., 2019; Hudson & Roberts, 2014; Thielmann & de Vries, 2021), the extraversion level is also expected to have a direct effect on the change goal of extraversion. A possible counteracting effect could be that there is a positive correlation between extraversion and motivation to train at work (Naquin & Holton, 2002). Nevertheless, the fact that high level extraverts need no higher level of extraversion should be stronger than the said results from Naquin and Holton (2002). Following hypotheses result:

H1: If a growth mindset of extraversion is induced, the change goal of extraversion in a social setting is higher than if a fixed mindset is induced.

H2: Introverts have a higher change goal of extraversion in a social setting than extraverts.

Additionally, Heslin et al. (2019, p. 2118) proposed: "In situations that cue extraversion, those who are low in extraversion exhibit more extraverted behavior when they hold more of a growth mindset than fixed mindset." According to that proposition, extraversion moderates the relation between mindset and extraverted behavior. In order to also investigate this proposition, the working context of the change goal of extraversion will be characterized as an extraversion group training, which cues extraversion. Heslin et al. (2019) support their proposition by studies that show the correlation of growth mindsets and extraverted behavior (Knee et al., 2003; Tamir et al., 2007). Tamir et al. (2007) showed that there is a positive correlation between existing growth mindsets of emotion and the controllability of emotions. It was also shown that more positive and less negative emotions were predicted by a growth mindset of emotion. Knee et al. (2003) showed that there is a positive relation between growth mindsets of relationships and the quality of relationships. This is backed up by Hudson et al. (2021), who found a significant correlation between extraversion and an existing growth mindset of personality in general and of extraversion, but therea are also previous studies that found no such correlation (e. g. Jach et al., 2017). According to Heslin et al. (2019), this relation could lead to more extraverted behavior when holding a growth mindset. Moreover, the difference between low extraversion and importance of extraversion at work could be seen as an important opportunity to grow for growth mindsets, which would be in line with the fact that people with growth mindsets deal better with difficult times (Yeager & Dweck, 2012). The following third hypothesis and the theorized model (Figure 1) emerge.

H3: Extraversion moderates the effect of mindset of extraversion induction on the change goal of extraversion in a social setting. The relative effect from fixed to growth mindset induction on the change goal of extraversion in a social setting is stronger for introverts than for extraverts.
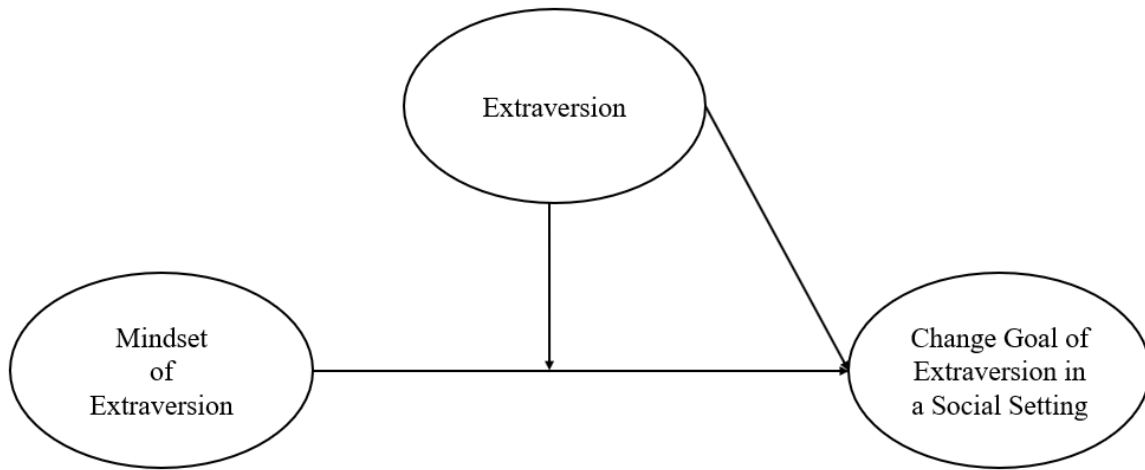
Figure 1. Theorized model of the present study

        Hudson (2021) summarized how such interventions theoretically work (Figure 2), based on the participants and the intervention. As this study deals with questions on how to boost the change goal of extraversion, especially the participant attributes are of interest. In the present study, the necessary motivation comes from the advantages of extraversion in the world of work (e. g. Wilmot et al., 2019) and subsequently from the goal to change. The self-regulation and belief about change come from growth mindset induction.
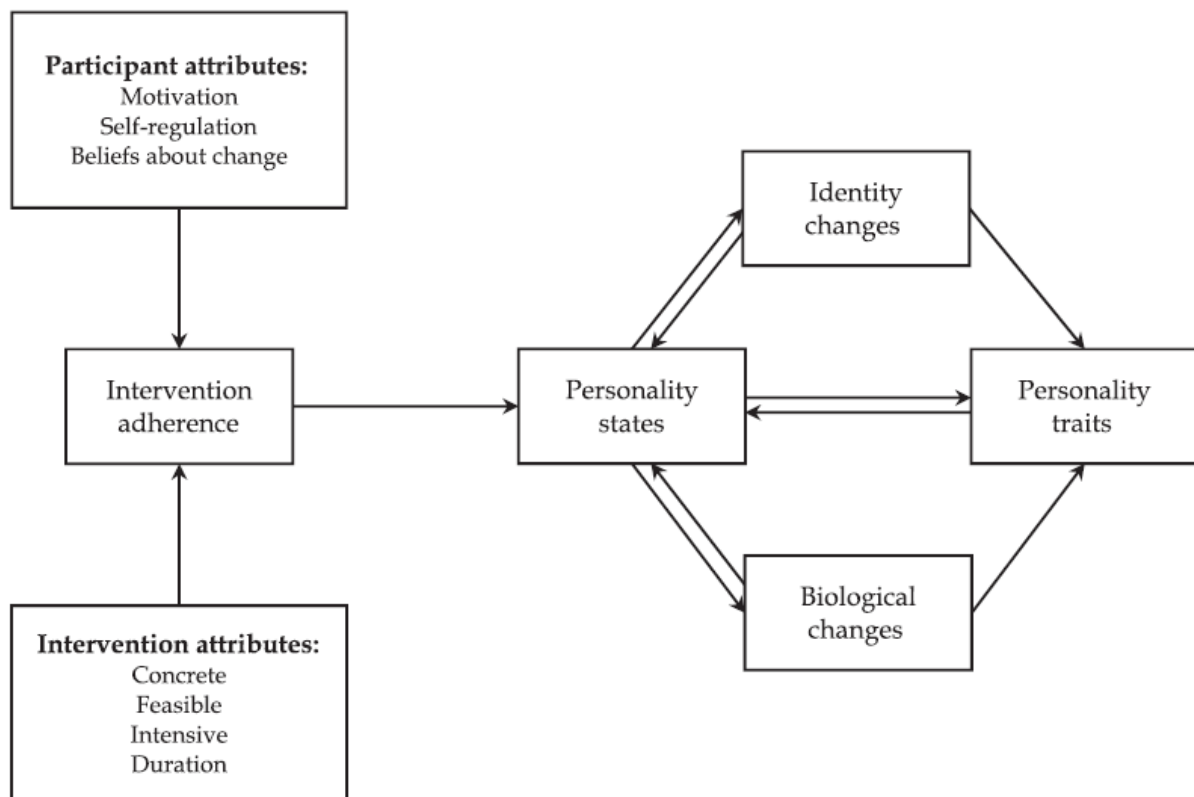

Figure 2. Theoretical model for personality change intervention by Hudson (2021)

Satisfaction with Extraversion

As giving feedback about extraversion, has an effect on change goals (Thielmann & de Vries, 2021), the satisfaction with the own extraversion level is also measured. Furthermore, as there is a correlation between extraversion and positive affect (Naquin & Holton, 2002), there could also be a correlation between extraversion and the satisfaction with it. Lundgren et al. (2019) summarized that positive affect can lead to higher motivation (Gegenfurtner et al., 2009), which in turn could lead to increased transfer of training (Burke & Hutchins, 2007). This could mean, that a positive reaction could lead to higher change goals, as the variable is the willingness to attend a training in the work context. At the same time, people with low extraversion and a negative reaction, could still show a high change goal. As no studies on satisfaction with extraversion with regards to change goals of extraversion are available and also the relations between the variables are not researched yet, an exploratory question will be investigated.

Exploratory Question 1: How does the satisfaction with extraversion relate to extraversion and the change goal of extraversion in a social setting?

Age

As there is some range of personality change over time (e. g. Haan et al., 1986; Roberts et al., 2006; Thielmann & de Vries, 2021), it is also of interest to look at how change goals of extraversion changes over lifetime. Extraversion change goals slightly decrease in life but even people of older age desire to change traits (Hudson & Fraley, 2016b; Quintus et al., 2017). This could also be due to study results that showed that extraversion slightly increases over lifetime and thus making change unnecessary (Hudson & Fraley, 2016b; Quintus et al., 2017).

At the same time, a small number of older employees attend vocational trainings, but this is could be due to the circumstance, that also less older employees get an offer to attend (Lazazzara et al., 2013; Taylor & Urwin, 2001). Also, to keep motivation high, life-long learning interventions can help (Boehm et al., 2021). There are also stereotypes of the potential of older employees (Boehm et al., 2021). Training offers are also seen as reward, as of the older employees, those with high performance, high skills and few absent days get more offers (Lazazzara et al., 2013). Additionally, the older the HR specialist, the higher the chance of older employees getting the offer (Lazazzara et al., 2013). As the chance of getting an offer may soften the negative relation between age and attending vocational trainings (Lazazzara et al., 2013; Taylor & Urwin, 2001), the role of age is investigated in an exploratory manner.

Exploratory Question 2: How does age affect the change goal of extraversion in a social setting?

Method

Sample

Recruiting participants was done through private contacts and the use of social media. A 10 € "Spotify" coupon was raffled as incentive to participate. The calculation of sample size was conducted via G*Power 3.1 (Faul et al., 2009). An a-priori sample size calculation (t-test, difference between two independent means; $d = 0.30$, $\alpha = .05$, $1\text{-}\beta = .80$, allocation ratio = 1) resulted in an optimal sample size of $N = 280$ participants. The expected effect size of $d = 0.30$ was based on various studies. In Hudson et al. (2021) the effect size of an existing growth mindset of extraversion on the goal to change it in emerging adults was $d = 0.16$. Also, the effect size of a growth mindset on learning goals is around $d = 0.38$ (Burnette et al., 2013). A medium effect size of a longer but similar intervention of intelligence on the dedicated time on a task was around $d = 0.60$ (Rangel et al., 2020). As the present study uses a short intervention, an effect size of $d = 0.30$ in-between the previous result was assumed. We preregistered that data collection would be stopped after 300 participants were recruited, or after nearly six weeks, by March 6th, 2022. As some of the participants answers could not be used, data collection was not stopped after reaching 300 participants, but by March 6th. All in all, 325 people participated between January 27th and March 6th, of which one had to be excluded due to not consenting to participate, three mentioned that they did not answer seriously and 31 gave false answers at a quiz based on the manipulation. The data of a total of $N = 290$ participants were used for the analysis ($M_{Age} = 28.09$, $SD_{Age} = 7.08$; 69.7% female, 1.4% other; 64.1% students). All participants claimed that they are 18 years or older.

Design & Procedure

The present research is an experimental online-study applying a between-subjects design with posttest. The online study allowed us to recruit an extensive and diverse sample during times of a pandemic. The whole study was in German. Items based on previous research were translated into German including a double-check by using a translation software.

At the beginning of the survey, participants had to read and consent to information on instructions, contact, terms, and conditions. After a short transition, extraversion was measured. The participants were randomly assigned to two groups. Both got a short text that defines extraversion based on Wilmot et al. (2019) and that stresses the crucial importance of extraversion in the world of work (e. g. Fletcher, 2013; Judge et al., 2002; Langvik et al.,

2021; Seibert & Kraimer, 2001). Afterwards, a question is asked "Now, can you increase your extraversion to enjoy these benefits?". Here, the texts divided the two groups. The *growth mindset group* (GG) got the answer "Yes. Research has shown that you can change your extraversion.", whereas the *fixed mindset group* (FG) got the answer "No. Research has shown that you cannot change your extraversion." Then, the text states that extraversion is or is not trainable like a muscle and that more and more people are ready to train extraversion or that they are accepting their level of extraversion. After that, strategic behavioral tips based on Sander (2019) were given, in order to train or to accept the own level of extraversion. Only after an invisible timer reaching 15 seconds, the participants could continue.

Afterwards, two questions were asked. They asked if extraverted people are more successful and if extraversion is changeable according to the text. This was used to exclude participants, that did not read the text carefully, during analysis. This helped strengthening the effect of the manipulation by rehearsing, which is based on Yeager et al. (2016b). For the same reason, a "saying-is-believing" task was used: "Now please think of a situation in your life where you needed more extraversion (in which your level of extraversion was sufficient), to achieve a goal. Write at least one sentence!" The whole short manipulation using education, putting together why and if someone can change, the "muscle" analogy, strategies, a quiz, and a "saying-is-believing" task is based on various mindset intervention research (Yeager et al., 2013, 2014; Yeager et al., 2016a; Yeager, Romero, et al., 2016; Yeager & Dweck, 2020). Then, the manipulation was checked measuring the mindset of extraversion. This is also in line with the prerequisites that trait related behavior has to be desirable, feasible, and has to become habitual in order to gain self-regulated trait change (Hennecke et al., 2014). Both intervention texts highlight the importance of extraversion, which make the change desirable. The growth mindset text highlights the feasibility. Later, the dependent variable change goal of extraversion depicts a context that makes habitual change possible.

Later, feedback about extraversion was given. A short text said: "At the beginning of the survey, the extent of your extraversion was measured. You will get your result on the following page." Afterwards, the extraversion level using a percentage, was communicated: "The level of your extraversion is…". Additional information was given: "The closer you are to 100%, the more extraverted you are. The closer you are to 0%, the more introverted you are." Here, satisfaction with extraversion was measured.

Next, a short instruction with an extraversion training ad was shown (see Appendix B) and the dependent variable change goal of extraversion in a social setting was measured. Only after an invisible timer had reached 10 seconds, the participants could continue.

After demographic information was collected, it was checked if the participants answered conscientiously (Seriousness-Check). There was also room to comment on the survey. After a debriefing including important literature and contact information, the participants could carry on to enter the raffle, which was located on a different website in order to guarantee anonymity. See the flowchart of the study procedure in Figure 3 and materials used in Appendix B. The study was also preregistered: https://aspredicted.org/de5te.pdf

The whole study was conducted via qualtrics. See a full preview here: https://univiepsy.eu.qualtrics.com/jfe/preview/SV_2bhDTUZBE6kqjYi?Q_CHL=preview&Q_SurveyVersionID=current
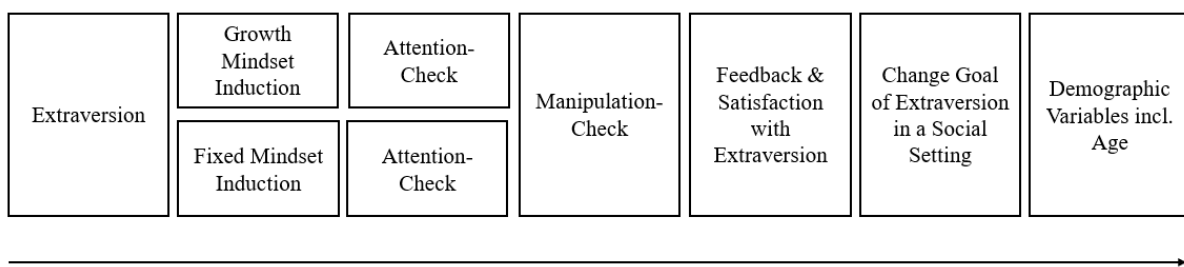

Figure 3. Flowchart of the study procedure

Measures

Extraversion

Extraversion was measured via 10 items based on Costa and McCraes (1992) so-called NEO-PI-R domains (1 = *I don't agree at all*; 5 = *I totally agree*). From the possible score of 10 to 50, a simpler score from 0 to 100% was generated, in order to give the participants a clear feedback about the level of extraversion later. Like all other items and the whole survey, the language used was German. The internal consistency proposed by Costa and McCraes (1992) of $\alpha = .86$ could be reached $\alpha = .87$. Two example items in English are "I make friends easily." and "I keep in the background." (reverse coded).

Attention Check

Two items were used to check the attention of the participants with regards to the text they had read and in order to strengthen the manipulation. One question asked: "What did the text say about extraverted people?" Possible answers were "They are more successful at work than introverts." and "They are less successful at work than introverts." The second question was differentiating with regards to the group the participants were assigned to: "Which statement is true according to the text?" Possible answers were "Extraversion is not

changeable." and "Extraversion is changeable.". People were excluded afterwards if they answered one of the to questions wrong.

Mindset of Extraversion (Manipulation Check)

Growth or fixed mindset manipulation was checked (MC) using six items to measure growth mindset based on Dweck (1999) and Schreiber et al. (2020), by changing one word in each of the six statements to "extraversion" (1 = *I don't agree at all*; 5 = *I totally agree*). For example: "No matter who you are, you can significantly change your own extraversion." Internal consistency was higher α = .93 according to the proposed α = .89 regarding the changeability of health by Schreiber et al. (2020).

Satisfaction with Extraversion

Satisfaction with extraversion was measured via one item (1 = *not happy at all*; 7 = *very happy*): "How happy are you with the feedback about your level of extraversion?" This item was presented with information that the level of extraversion was measured and real feedback on extraversion, ranging from 0 to 100%, was given.

Change Goal of Extraversion in a Social Setting

The change goal of extraversion in a social setting was also measured via one item (1 = *very unlikely*; 7 = *very likely*). Before the item was measured, instructions together with a flyer (Appendix B) were presented: "Your current or future employer offers you the chance to participate in this group-training to increase your level of extraversion. Please read the following flyer!" The term "group-training" was included to signal that the training is in a social setting, which should cue that extraverted behavior is useful. The flyer calls to "Find your inner extravert to boost your career and your life satisfaction!" by participating in a one-day extraversion training. The following question measures the change goal of extraversion in a social setting by the willingness to attend a group training in order to increase extraversion: "How likely would you participate?"

Demographic Variables

Age, gender, student status, and if applicable, studies, were measured. Additionally, a seriousness check was examined. All materials and items can be found in Appendix B and C.

Ethics

Overall, the study offers no ethical concerns. One item of the ethics checklist in Appendix E had to be answered with "yes", as the participants were not fully informed about the purpose and the content of the study, as two cover stories were presented. Both cover stories exaggerated the possibilities of extraversion changeability or unchangeability. Thus, a

very detailed debriefing was presented in order to inform the participants about the current state of research on this topic (Appendix B – Materials: Debriefing).

Results

Descriptive Statistics

All means and standard deviations can be found in Table 1. All percentual distributions and correlations can be found in Appendix C and Table 1. Significant correlations are between change goal in a social setting and the mindset of extraversion manipulation check (MC) variable ($r = .23$, $p < .01$) and satisfaction with extraversion ($r = -.15$, $p < .01$). Mindset (MC) correlates significantly positively with extraversion ($r = .25$, $p < .01$). Satisfaction with extraversion correlates significantly positively with extraversion ($r = .26$, $p < .01$). Using boxplots, there was a ceiling effect indicated for satisfaction with extraversion ($M = 5.21$, $SD = 1.55$). The whole mindset manipulation took around one minute on average in both groups.

Table 1

Overview over all means, standard deviations and correlations of measures

Construct	*M*	*SD*	1.	2.	3.	4
1. Extraversion	0.52	0.18				
2. Mindset of extraversion (MC)	3.99	1.38	.25**			
3. Satisfaction with extraversion	5.21	1.55	.26**	-.01		
4. Change goal of extraversion in a social setting	3.45	1.82	.02	.23**	-.15**	
5. Age	28.09	7.08	.05	.03	.04	-.11

Note. ** $p < 0.01$ (two-sided). * $p < 0.05$ (two-sided)

Preparatory Analyses

Randomization checks with regards to condition were successful for age ($M_{Fixed} = 27.38$, $SD_{Fixed} = 6.05$, $M_{Growth} = 28.69$, $SD_{Growth} = 7.82$, $t[286] = -1.61$, $p_{two-sided} = .11$, $d = -0.19$), extraversion ($M_{Fixed} = 0.51$, $SD_{Fixed} = 0.18$, $M_{Growth} = 0.53$, $SD_{Growth} = 0.18$, $t[288] = -0.89$, $p_{two-sided} = .37$, $d = -0.11$), student ($X^2 = 0.03$, $df = 1$, $p = .86$) and gender ($X^2 = 1.39$, df

= 2, p = .50). The preconditions for Chi-square testing gender were limited due to very few participants that identified themselves as "other" (1.4%), but no significant difference between conditions was found. Also, the t-test preconditions testing age, were limited due to outliers in both groups, but no significant difference between conditions was found. No confounding of the dependent variable change goal in a social setting was found for gender (p = .87, η^2 = .001) and student status ($p_{\text{two-sided}}$ = .40). The manipulation check for mindset manipulations, which used modified items from Dweck (1999) and Schreiber et al. (2020), were successful (M_{Fixed} = 3.52, SD_{Fixed} = 1.46, M_{Growth} = 4.38, SD_{Growth} = 1.18, $t[253]$ = -5.44, $p_{\text{one-sided}}$ < .001, d = -0.65). This means that people in the growth mindset group had higher growth mindsets than people in the fixed mindset group.

Confirmatory Analyses

To test whether a growth mindset of extraversion induction boosts the change goal of extraversion in a social setting in contrast to a fixed mindset induction (H1), a t-test was conducted. A significant result was found (p = .022, $t[286]$ = -2.01, d = -0.24). As the mean change goal of extraversion in a social setting was higher in the growth mindset manipulation group than in the fixed mindset group (M_{Fixed} = 3.22, SD_{Fixed} = 1.72, M_{Growth} = 3.64, SD_{Growth} = 1.88), hypothesis 1 was confirmed. Figure 4 shows these results. Preconditions for the t-test were also investigated. All in all, the preconditions were met. The Kolmogorov-Smirnov test for normal distribution was significant (p = .03), but as the sample size is big (N = 291) there were no problem expected, as discussed by Norman (2010). Also, the Levene test for homogeneity of variances was significant (p = .046), so the corresponding p-value was reported.
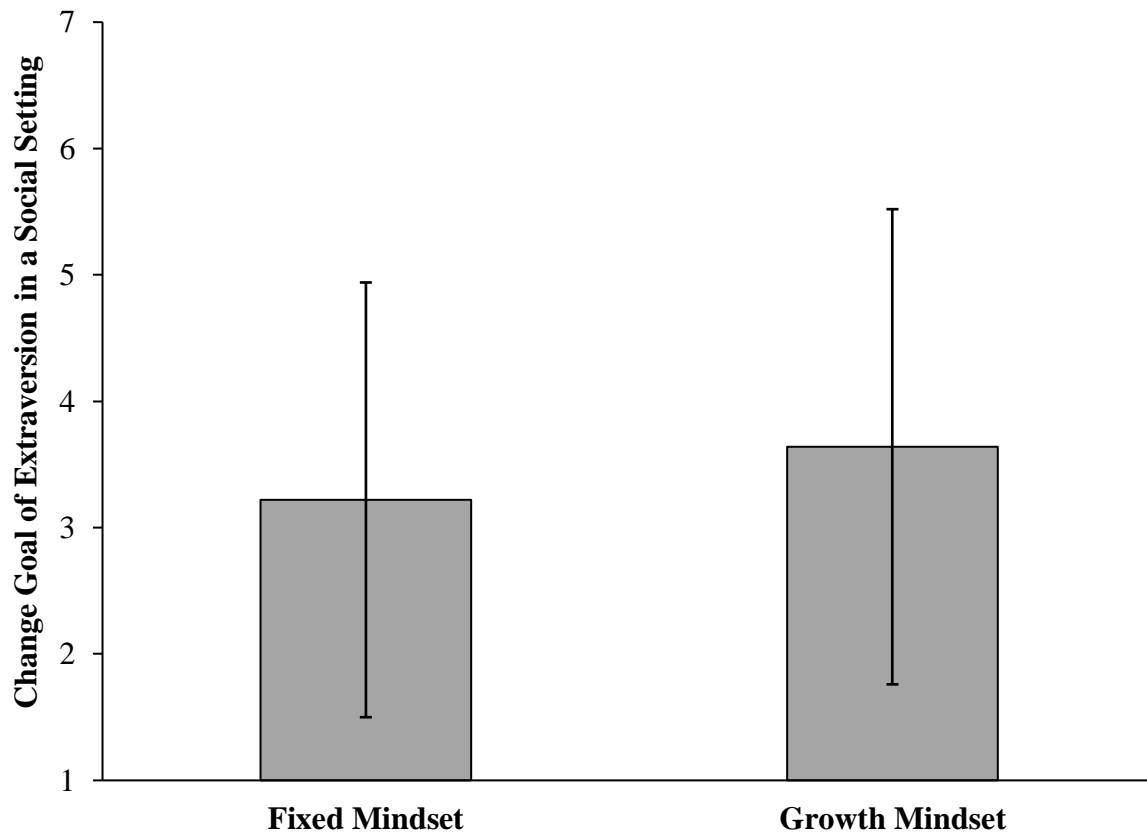
Figure 4. Means and standard deviations of change goal of extraversion in a social setting in the fixed and growth mindset group

To test whether introverts have a higher change goal of extraversion in a social setting than extraverts (H2), a regression analysis was conducted. The results were not significant (β = 0.02, *SE* = 0.58, $t[288]$ = 0.40, p = .69, r^2 = .001). Thus, no relationship between extraversion and change goal of extraversion in a social setting was found. All preconditions for regression analysis were met.

To test hypothesis 3, a moderation analysis via PROCESS model 1 (5000 bootstraps) by Hayes (2013) was used. Table 2 shows the non-sigificant results (r^2 = .015). Thus, no moderation of extraversion on the relationship between mindset manipulation condition and change goal was found. The visual investigation for normal distribution of residuals was not promising, but as the sample size is big (*N* = 290), there should be no problems expected, as discussed by Norman (2010). Also, all other preconditions were met. Figure 5 depicts the conditions and change goal of extraversion in a social setting for different levels of the moderator. The moderation is not only not significant, but also in the opposite direction than expected, as participants low in extraversion got the smallest effect size from fixed to growth mindset in comparison with medium and high extraverts.

Table 2

Results of Moderation Analysis via PROCESS Modell 1

Predictor	*b*	*SE*	*t*(286)	*p*
Condition	0.19	0.65	0.30	.77
Extraversion	-0.07	0.85	-0.08	.94
Cond. x Extrav.	0.44	1.17	0.38	.71

Note. DV = Change goal of extraversion in a social setting; Condition = fixed mindset of extraversion (0) or growth mindset of extraversion (1)
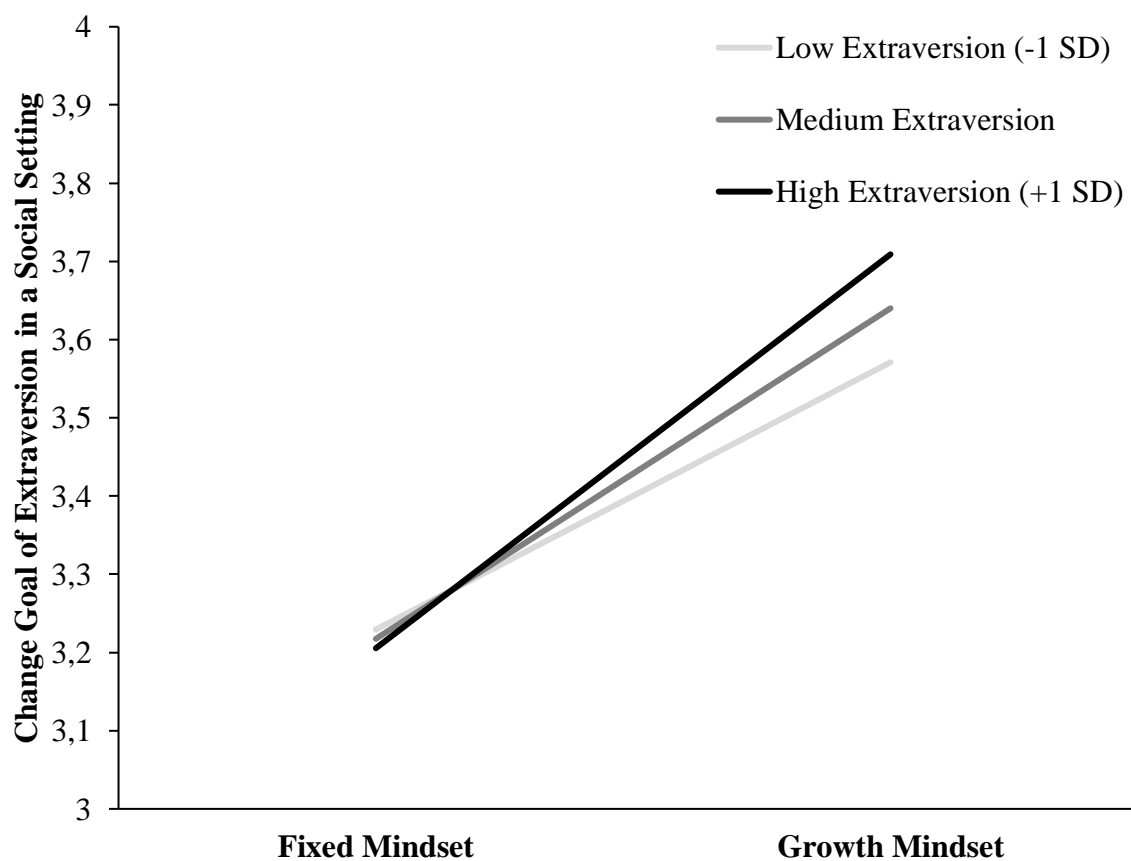
Figure 5. Regressions of change goal of extraversion by condition and level of extraversion

Exploratory Analyses

For exploratory question 1 the relationship between extraversion and satisfaction with extraversion was investigated. An regression analysis showed a significant relationship between extraversion and satisfaction with extraversion (β = 0.26, *SE* = 0.48, *t*[288] = 4.58, *p* < .001, r^2 = .068). All preconditions for regression analysis were met.

In addition, the relationship between satisfaction with extraversion and change goal of extraversion in a social setting was investigated. An regression analysis showed a significant relationship (β = -0.15, *SE* = 0.07, *t*[288] = -2.61, *p* = .009, r^2 = .023). All preconditions for regression analysis were met.

In order to test a model that corresponds to these results, a mediation analysis via PROCESS model 4 (5000 bootstraps) by Hayes (2013) was conducted. This is applicable, even when no relationship between extraversion and change goal was found, according to Rucker et al., (2011). Figure 6 shows the regression coefficients and standard errors of the mediation model. There was a significant indirect effect (*b* = -0.44, *SE* = 0.20, [-0.88, -0. 10]) from extraversion on change goal of extraversion in a social setting over satisfaction with extraversion. All preconditions were met.
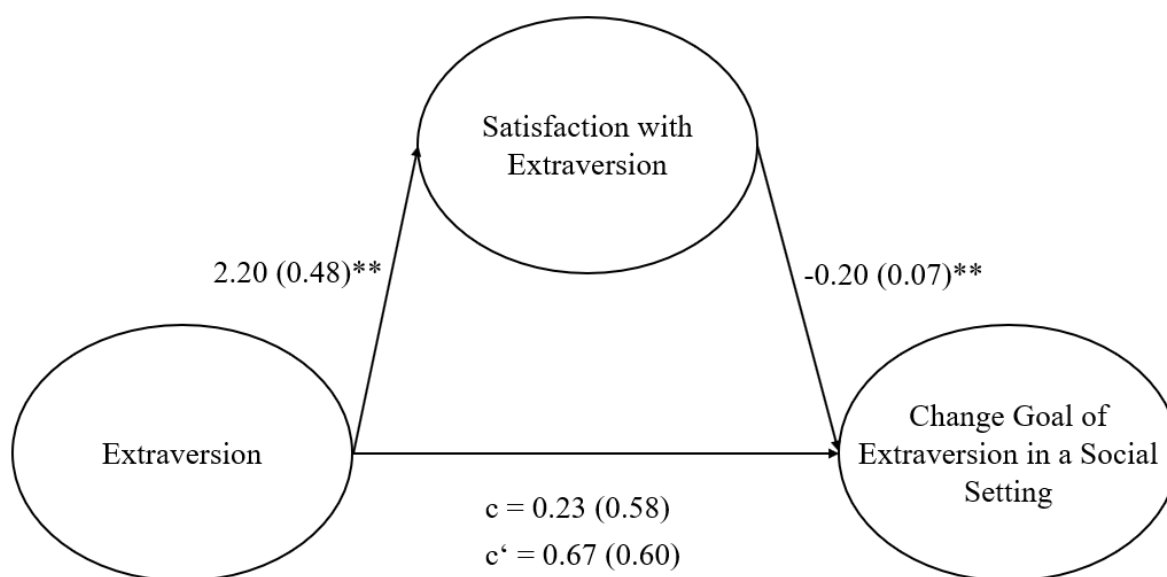

Figure 6. Mediation Model: Satisfaction with extraversion as mediator between extraversion and change goal with regression coefficients and standard error

Note. ** *p* < 0.01 (two-sided). * *p* < 0.05 (two-sided)

For exploratory question 2 the relationship between age and change goal of extraversion in a social setting was tested via regression analysis. A marginally significant negative relationship was found (β = -0.11, *SE* = 0.02, *t*[288] = -1.92, *p* = .055, r^2 = .013).

One precondition of regression analysis was not met, as outliers were indicated. All in all, figure 7 shows all significant and marginally significant relations of confirmatory and exploratory analyses.
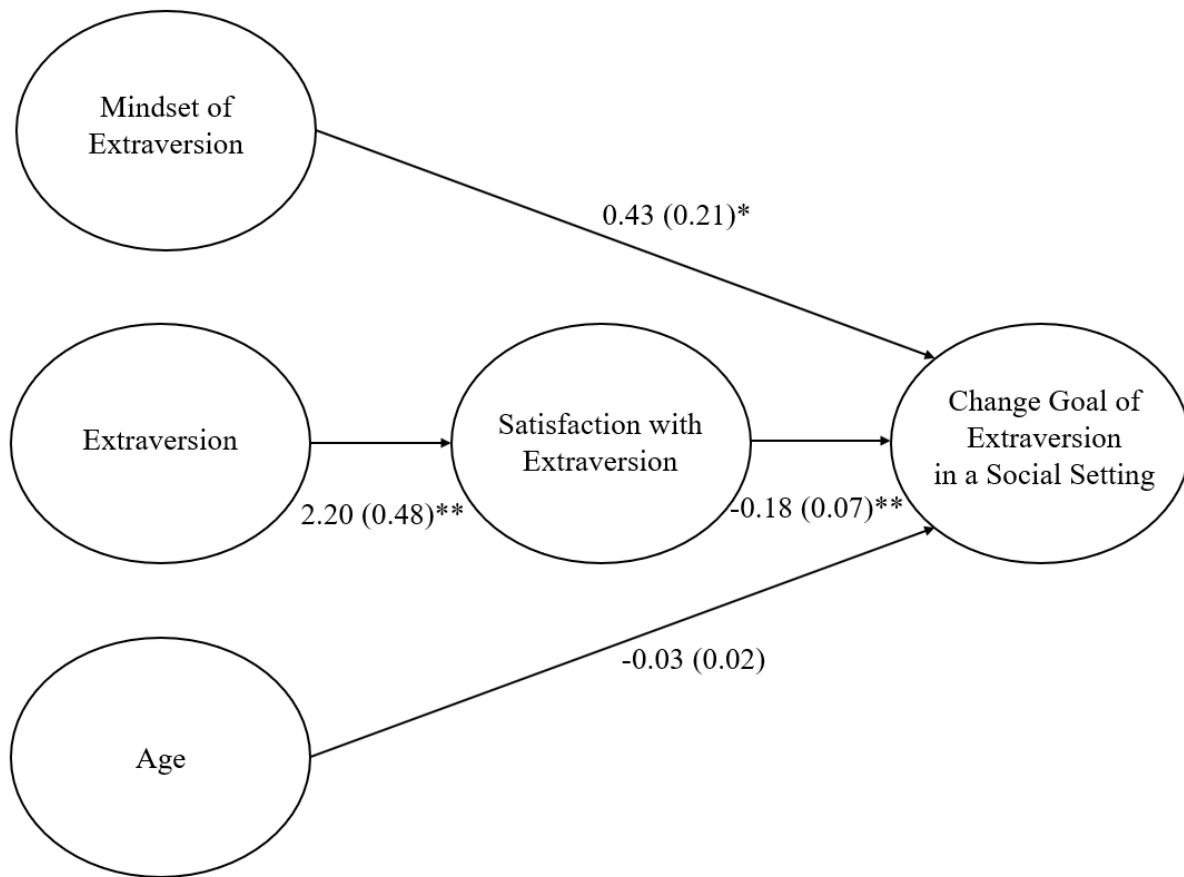

Figure 7. Significant and marginally significant relationships found in confirmatory and exploratory analyses

Note. Mindset of extraversion relates to condition fixed or growth mindset. ** Correlation is significant under p = 0.01 (two-sided). * Correlation is significant under $p = 0.05$ (two-sided)

Additional Analysis

In order to further investigate the role of the evidently important factor satisfaction with extraversion (SWE), a moderation analysis via PROCESS model 1 (Hayes, 2013) was conducted. Possible effects of condition as moderator between satisfaction with extraversion and change goal of extraversion in a social setting were investigated. Table 3 shows the results of the analysis ($r^2 = .050$). There is a significant relationship between satisfaction with extraversion and change goal, in a way that less satisfaction with extraversion relates to a higher change goal. Condition, on the other hand, is now not significant anymore, it even changes into the opposite direction as in hypothesis 1. The interaction term was marginally

significant. Participants with a growth mindset had higher change goals than the ones with a fixed mindset, when satisfaction with extraversion was neutral and positive (Figure 8).

Table 3

Results of Moderation Analysis via PROCESS Modell 1

Predictor	*b*	*SE*	*t*(286)	*p*
Satisfaction with extraversion	-0.34	0.11	-3.20	.002
Condition	-0.98	0.75	-1.31	.19
SWE x Cond.	0.27	0.14	1.96	.051

Note. DV = Change goal of extraversion in a social setting; Condition = fixed mindset of extraversion (0), growth mindset of extraversion (1), SWE = Satisfaction with extraversion
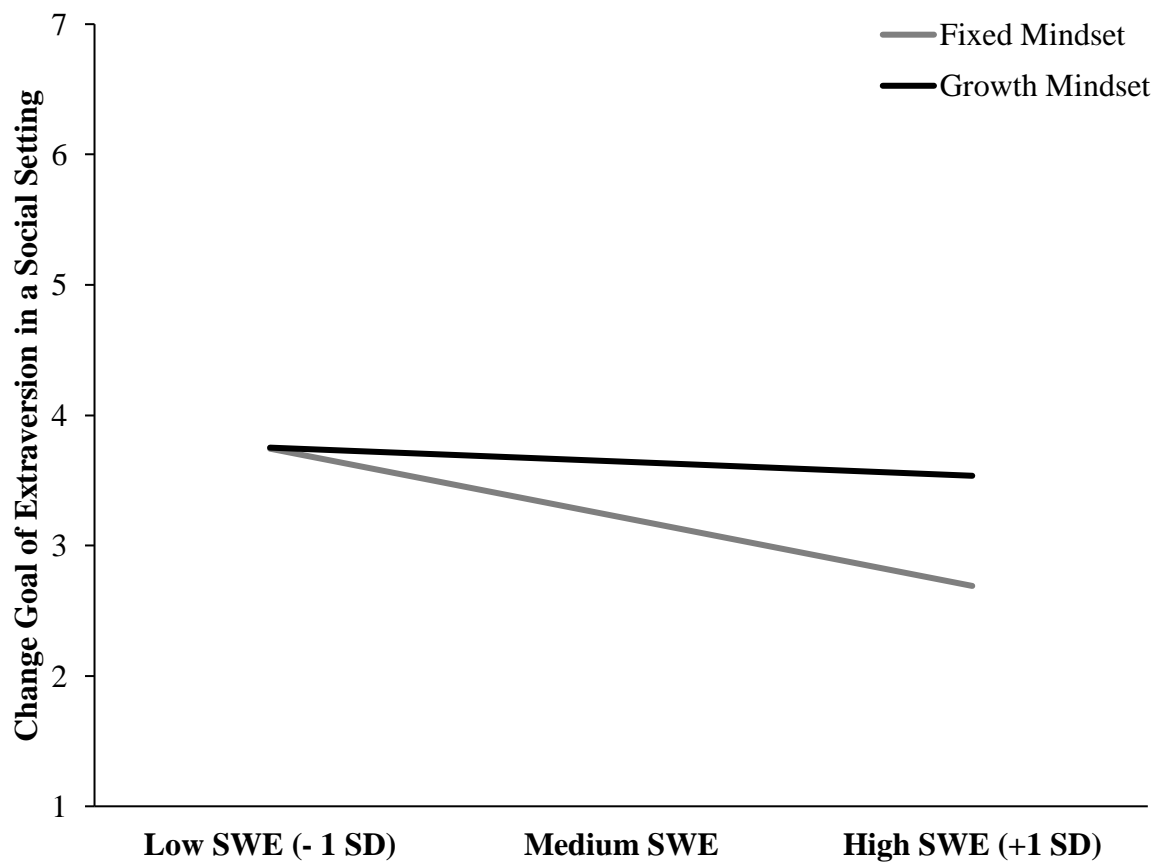
Figure 8. Regressions of change goal of extraversion in a social setting satisfaction with extraversion and condition

Note. SWE = Satisfaction with extraversion

Discussion

The present study investigated the effects of an extraversion mindset manipulation on the change goal of extraversion in a social setting. This is based on various studies that showed effects of mindset intervention on a change goal (e. g. Hudson et al., 2021) and actual personality change (e. g. Schleider & Weisz, 2018). Here, a short intervention was used in order to manipulate mindset and subsequently an antecedent of change, the change goal (e.g. Hudson et al., 2019, 2020). An antecedent of the change goal, namely level of a trait (e. g. Thielmann & de Vries, 2021), was also investigated. The other antecedents, life satisfaction (Herringer, 1998) and social desirability (e. g. Hudson & Roberts, 2014), are to a degree represented by extraversion, as there are relations to it (Baranski et al., 2017; Hudson & Roberts, 2014). Furthermore, the role of extraversion as moderator between mindset and change goal was investigated. Based on a theoretical proposition by Heslin et al. (2019) that says that growth mindset introverts show more extraverted behavior in situations that are characterized as extraverted, than fixed mindset introverts, an effect was expected. Additionally, satisfaction with extraversion and age were examined.

A t-test, analyzing the experimentally triggered effect of growth and fixed mindset on change goal, showed significant results in line with hypothesis 1 and previous research (e. g. Hudson et al., 2021). A growth mindset manipulation of extraversion resulted in a higher change goal of extraversion in a social setting in comparison to a fixed mindset. As the manipulation check was also successful, it is shown that also very brief one-minute interventions can affect the change goal, which in turn could yield actual personality change. This is one of the first studies showing that such a short intervention works. Based on this results, further research can investigate the long term effectiveness of short mindset interventions. Furthermore practitioners profit form this results, as very short, efficient, and less expensive interventions are possible. As both groups got the same information about the importance of extraversion at work, the effect can be directly related to the manipulation. Furthermore, the social context including an extraversion group-training organized by the employer, is a realistic work setting. This setting also cues extraverted behavior, which is especially useful for extraversion change (e. g. Bleidorn et al., 2018; Hudson et al., 2019; Margolis & Lyubomirsky, 2020) and could predict actual change.

In contrast, a regression analysis could not find a significant relationship between extraversion on the change goal. Thus, hypothesis 2 could not be confirmed. Introverts and extraverts did not have a significantly different change goal of extraversion in a social setting.

The relation was even slightly in the opposite direction, with extraverts having higher change goals. The results were not in line with previous research (e. g. Thielmann & de Vries, 2021). This could be due to the fact that extraverts generally like to train at work (Naquin & Holton, 2002) and that they get positive affect from behaving in an extraverted manner (Barrick et al., 2013), which was cued by the context.

Similarly, hypothesis 3 could also be not confirmed. Extraversion did not moderate the effect of mindset of extraversion induction on the change goal of extraversion in a social setting. The relative effect from fixed to growth mindset induction on the change goal of extraversion in a social setting was not stronger for introverts than for extraverts. This hypothesis based on a proposition by Heslin et al. (2019) was not experimentally researched yet and results were not in line with the proposition made.

The investigation of the exploratory hypotheses yielded interesting results. The first exploratory question investigated the relation between satisfaction with extraversion and extraversion as well as change goal. Apparently, satisfaction with extraversion significantly mediated the relation between extraversion and the change goal of extraversion in a social setting. There was no direct effect from extraversion on change goal, which is in line with failed hypothesis 2. The mediation showed a positive connection between extraversion and satisfaction. This is also in line with previous research, as there is a connection between extraversion and positive affect (Naquin & Holton, 2002), which could explain the result to some degree. Furthermore, satisfaction had a negative connection to the change goal of extraversion in a social setting. Apparently, especially if participants were unsatisfied with their level of extraversion, they tried to change it. As both groups got information about the importance of extraversion at work, the information was made available, so a valuation was given a push. This relation between satisfaction and change goals is also in line with theory, as based on previous research (Baumeister, 1994; Kiecolt, 1994), Hudson and Fraley (2017) argued that change goals can be triggered by dissatisfaction. Pursuing change goals can also improve the similar concept well-being, but can also have negative effects due to unrealistic expectations and focusing on one's shortcomings for example (Higgins, 1987; Hudson & Fraley, 2016a, 2017). In contrast, having change goals and changing successfully has positive effects on well-being (Hudson & Fraley, 2016a).

In the preregistration (Appendix D) another word for satisfaction with extraversion was used in exploratory question 1, namely test taker's reaction. Test taker's reactions are positive or negative "attitudes, affect, or cognitions" (Ryan & Ployhart, 2000, p. 566) towards the process of testing (Lundgren et al., 2019). In the present work, satisfaction with

extraversion was used, as it is a more fitting term for the item: "How happy are you with the feedback about your level of extraversion?". At the same time, test takers' reactions could play a role, as participants could be unhappy about being tested about their extraversion without their knowledge. This could have distorted the measurement of satisfaction with extraversion to some extent.

The second exploratory question investigated the role of age and change goal. A marginally significant negative relationship was found. This means, the older the participant, the lower was the change goal of extraversion in a social setting. This is to some degree in line with previous research, that says that older people attend less trainings, but also get less offers for trainings (Lazazzara et al., 2013; Taylor & Urwin, 2001). As there were age outliers detected, this may be the reason, for the only marginally significant relationship.

The additional analysis provided further insight into the role of satisfaction with extraversion. It was suspected that growth mindset has no effect on change goal when participants are not satisfied with their level of extraversion. Allegedly the dissatisfaction factor that effects change goals (Hudson & Fraley, 2017) can be stronger than the mindset induction. This could be due to the shortness of the mindset induction. Another explanation could be that high dissatisfaction represents an extreme, non-moderate situation, in which mindset differences vanish like personality differences, based on TAT (Tett & Burnett, 2003; Tett & Guterman, 2000). Furthermore dissatisfaction could be a cue to make change goals necessary in order to dissolve the tension that the dissatisfaction released.

All in all, this study is one of the first ones that test the effectiveness of very short mindset interventions in the field of work. Future studies can build on the results and can use them to investigate actual personality change in the work context. Thus, practitioners can profit from such a short and economic human resources (HR) development tool.

Limitations and Future Directions

Obviously, the study's biggest limitation is that no actual change and longitudinal data was measured. Hudson and Fraley (2017) emphasized the importance of longitudinal designs that exceed the time span of one year. Looking at potential actual change, this would give important insight into the question if personality can change by using manipulations this short. The whole procedure could also be accomplished by real-life experimental case studies in different organizations. Various points of measurement would be needed, including a baseline measurement of mindset. Also having a comparison between a shorter and a longer intervention would make the interventions comparable. This could also answer how long growth mindset intervention should be in order to have desired effects and subsequentely to

be efficient. Problematic could be that a fixed mindset group would not be beneficial if the job benefits from growth mindset intervention. This problem could be solved by having control groups that get no intervention at all or a completely different but helpful intervention like environmental consciousness or destiny mindset interventions regarding extraversion. In general, predominantly introverts should be target of the manipulation, in order to get a more precise estimation of the effect size for real life application at work. Additionally, different fields of work, different abilities and more dimensions of personality should be measured in a more comprehensive way.

Another limitation of the study is that it only used short self-reported measures. Hudson and Fraley (2017) called for multimethod triangulation by also using objective behavioral measures and observer reports. That is given weight due to the circumstance that many people wrongly estimate their change in traits (Hudson, Derringer, et al., 2019). Also, a change goal of extraversion is higher if others agree on a low level (Quintus et al., 2017). The goal to measure very effectively in order to reach the sample size was met, as the survey only took around six minutes, but this also meant that only very short measures and few items were used. Future research could integrate this in a more comprehensive, multimethod, experimental case study.

Like Hudson and Fraley (2017) argued, also the value of change and the intrinsic motivation for change should be measured. This is backed up by research that showed the importance of a proactive personality, which is naturally associated with motivation (e. g. Major et al., 2006). Additionally, job enrichment and a proactive personality predict organizational change-oriented behavior over work engagement as mediator (Marinova et al., 2015). At the same time, if someone finds passion in work, a fixed mindset is related to boundless motivation (O'Keefe et al., 2018). In the present study, the value of change was primed through giving information about the importance of extraversion at work. It would be possible that the value is represented in satisfaction with extraversion, which could be a result of the difference between the own value of extraversion and the actual level of extraversion. In the work context, also factors of different organizational levels should be assessed. One research for example showed the importance of transformational leadership in relation with growth mindsets (Caniëls et al., 2018). There, transformational leadership moderated the relationship between a proactive personality and work engagement, when the employees were holding a growth mindset.

Another limitation is that the sample is not representative as 69.4% of the participants are female and 64.3% are students. So, the sample is predominantly consisting of female students. This is apparently due to recruiting via social media students' groups.

A general limitation is due to the investigated constructs, as actual mindset and extraversion correlated, which is also backed up by previous research (Hudson et al., 2021). As the effect of the mindset manipulation also vanished in the regression analysis for hypothesis 3, the results could be distorted by the fact that actual mindset and extraversion correlated significantly positively. This also leads to the question of how to divide the constructs extraversion and mindset, as extraverts are more active (Costa & McCrae, 1992), which could foster growth mindsets more easily. Furthermore, extraversion includes positive affect per definition (Ostendorf & Angleitner, 2003). This could explain, why satisfaction with extraversion did predict change goal and extraversion did not. Therefore, it would be interesting to look at effects of extraversion facets like positive affect on the change goal.

In order to better understand why hypothesis 2 and 3 failed, it would also be interesting, to additionally look at a non-social training context. There could be possible effects for introverts, as that situation would be cued as introverted. This could be conducted using the app PEACH by Stieger et al. (2021). At the same time, this change goal context would be not as predictive as the present one, as less extraverted behavior is addressed. At the same time, an app could be an easier way to get introverts started.

The present study did not differentiate between fields of work and also did not investigate other important abilities or personality traits that could foster career success. Moreover, there should be a bigger focus on different jobs, as different tasks require different qualifications. Requirement profiles of different jobs could be taken into account. This is similar to the limitations Wilmot et al. (2019) noted.

Practical Implications

Practical implications of the present research are especially useful for HR development. If employees need more extraversion for a higher job fit, growth mindset interventions could help. Hence, an extraversion growth mindset intervention could not only promote extraversion and job fit, but also attendance of trainings, employee coaching, and team meetings. This could not only promote productivity, but also life satisfaction (Herringer, 1998). Jobs that require extraversion are jobs with constant interpersonal interactions (Barrick et al., 2013; Heslin et al., 2019), like nursing (Wihler et al., 2017), sales, management (Barrick et al., 2002) and customer service (Chi et al., 2012). Typical situations are for example employee coaching and team meetings (Heslin et al., 2019). This is based on TAT

(Tett & Burnett, 2003; Tett & Guterman, 2000), which says that trait-related behavior is shown, especially when there are moderate trait-relevant situational cues. This also means that everyday situations at work should be the primary goal such growth mindset interventions of personality.

As destiny mindsets (job is meant to be or not) also play a positive, moderating role on the positive relation of job fit and job satisfaction (Burnette & Pollack, 2013) adequate mindset interventions can help. Destiny mindsets deal with the question if something is "meant to be", whereas fixed and growth mindsets deal with the question if something can be changed or developed (Burnette & Pollack, 2013). Also both, fixed and growth mindsets, can lead to work passion, as fixed mindsets choose more fitting jobs from the beginning and thus gain passion, whereas growth mindsets develop passion (Chen et al., 2015). The question arises if for example already extraverted salespeople, would benefit more from a fixed or destiny mindset intervention.

According to Jelley (2021), personality feedback for job development should be handled with caution as there is no clear evidence for positive effects on productivity. Chen et al. (2015) argued that people with fixed mindsets could be more receptive to personality tests and people with growth mindsets to organizational training and socialization. The present study indicates that it should also be of importance to evaluate the satisfaction with the level of a trait that was measured, as there could be an effect on change.

Han & Stieha (2020) emphasize the importance of the various levels in organizations that can be a target of growth mindset interventions, from an invidual, to a dyadic, to an organizational system level. According to them, interventions can be done via training, leadership development, coaching, human resource practices, recruiting, and performance evaluation systems. As this study shows that a small push towards a growth mindset can also boost the willingness to attend such programs, the intervention should already start before the designated program itself. This means that managers could boost attendance by supplying educational material or information about growth mindsets before announcing the programs. This could be done for example during staff appraisals, by communicating educational information about growth mindsets and highlighting possible skills that could be improved or developed.

Conclusion

The present study indicates that there is probably an effect of mindset of extraversion interventions on actual change over a change goal. Furthermore, next to a potential role of age, satisfaction with extraversion is established as a potentially important factor mediating

the effect of extraversion level on change goal. Future research could further investigate these relations by using a more comprehensive, longitudinal and real-life context research designs. Practitioners in HR especially profit from new insights into the effectiveness of such a short growth mindset intervention and the importance of satisfaction with a trait communicated in personality feedback.

Literature

Allan, J., Leeson, P., Fruyt, F. D., & Martin, S. (2018). *Application of a 10 week coaching program designed to facilitate volitional personality change: Overall effects on personality and the impact of targeting. 16*(1). https://doi.org/10.24384/000470

Allemand, M., & Flückiger, C. (2017). Changing personality traits: Some considerations from psychotherapy process-outcome research for intervention efforts on intentional personality change. *Journal of Psychotherapy Integration*, *27*(4), 476–494. https://doi.org/10.1037/int0000094

Allemand, M., & Flückiger, C. (2022). Personality change through digital-coaching interventions. *Current Directions in Psychological Science*, *31*(1), 41–48. https://doi.org/10.1177/09637214211067782

Anusic, I., & Schimmack, U. (2016). Stability and change of personality traits, self-esteem, and well-being: Introducing the meta-analytic stability and change model of retest correlations. *Journal of Personality and Social Psychology*, *110*(5), 766–781. https://doi.org/10.1037/pspp0000066

Baranski, E., Gray, J., Morse, P., & Dunlop, W. (2020). From desire to development? A multi-sample, idiographic examination of volitional personality change. *Journal of Research in Personality*, *85*, 103910. https://doi.org/10.1016/j.jrp.2019.103910

Baranski, E., Morse, P. J., & Dunlop, W. L. (2017). Lay conceptions of volitional personality change: From strategies pursued to stories told: Volitional personality change. *Journal of Personality*, *85*(3), 285–299. https://doi.org/10.1111/jopy.12240

Barrick, M. R., Mount, M. K., & Li, N. (2013). The theory of purposeful work behavior: The role of personality, higher-order goals, and job characteristics. *Academy of Management Review*, *38*(1), 132–153. https://doi.org/10.5465/amr.2010.0479

Barrick, M. R., Stewart, G. L., & Piotrowski, M. (2002). Personality and job performance: Test of the mediating effects of motivation among sales representatives. *Journal of Applied Psychology*, *87*(1), 43–51. https://doi.org/10.1037/0021-9010.87.1.43

Baumeister, R. F. (1994). The crystallization of discontent in the process of major life change. In T. F. Heatherton & J. L. Weinberger (Eds.), *Can personality change?* (pp. 281–297). American Psychological Association. https://doi.org/10.1037/10143-012

Bernecker, K., & Job, V. (2019). Mindset Theory. In K. Sassenberg & M. L. W. Vliek (Eds.), *Social Psychology in action* (pp. 179–191). Springer International Publishing. https://doi.org/10.1007/978-3-030-13788-5_12

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246–263. https://doi.org/10.1111/j.1467-8624.2007.00995.x

Bleidorn, W., Hopwood, C. J., Back, M. D., Denissen, J. J. A., Hennecke, M., Jokela, M., Kandler, C., Lucas, R. E., Luhmann, M., Orth, U., Roberts, B. W., Wagner, J., Wrzus, C., & Zimmermann, J. (2020). Longitudinal experience–Wide association studies—A framework for studying personality change. *European Journal of Personality*, *34*(3), 285–300. https://doi.org/10.1002/per.2247

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2018). Life events and personality trait change: Life events and trait change. *Journal of Personality*, *86*(1), 83–96. https://doi.org/10.1111/jopy.12286

Blevins, D. P., Stackhouse, M. R. D., & Dionne, S. D. (2022). Righting the balance: Understanding introverts (and extraverts) in the workplace. *International Journal of Management Reviews*, *24*(1), 78–98. https://doi.org/10.1111/ijmr.12268

Boehm, S. A., Schröder, H., & Bal, M. (2021). Age-related human resource management policies and practices: Antecedents, outcomes, and conceptualizations. *Work, Aging and Retirement*, *7*(4), 257–272. https://doi.org/10.1093/workar/waab024

Burke, L. A., & Hutchins, H. M. (2007). Training transfer: An integrative literature review. *Human Resource Development Review*, *6*(3), 263–296. https://doi.org/10.1177/1534484307303035

Burnette, J. L. (2010). Implicit theories of body weight: Entity beliefs can weigh you down. *Personality and Social Psychology Bulletin*, *36*(3), 410–422. https://doi.org/10.1177/0146167209359768

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin*, *139*(3), 655–701. https://doi.org/10.1037/a0029531

Burnette, J. L., & Pollack, J. M. (2013). Implicit theories of work and job fit: Implications for job and life satisfaction. *Basic and Applied Social Psychology*, *35*(4), 360–372. https://doi.org/10.1080/01973533.2013.803964

Caniëls, M. C. J., Semeijn, J. H., & Renders, I. H. M. (2018). Mind the mindset! The interaction of proactive personality, transformational leadership and growth mindset for engagement at work. *Career Development International*, *23*(1), 48–66. https://doi.org/10.1108/CDI-11-2016-0194

Caspi, A., Bem, D. J., & Elder, G. H. (1989). Continuities and consequences of interactional styles across the life course. *Journal of Personality*, *57*(2), 375–406. https://doi.org/10.1111/j.1467-6494.1989.tb00487.x

Chen, P., Ellsworth, P. C., & Schwarz, N. (2015). Finding a fit or developing it: Implicit theories about achieving passion for work. *Personality and Social Psychology Bulletin*, *41*(10), 1411–1424. https://doi.org/10.1177/0146167215596988

Chen, P., Lin, Y., Pereira, D. J. H., O'Keefe, P. A., & Yates, J. F. (2021). Fanning the flames of passion: A develop mindset predicts strategy-use intentions to cultivate passion. *Frontiers in Psychology*, *12*, 634903. https://doi.org/10.3389/fpsyg.2021.634903

Chi, N.-W., Grandey, A. A., Diamond, J. A., & Krimmel, K. R. (2012). Want a tip? Service performance as a function of emotion regulation and extraversion: Correction to Chi, Grandey, Diamond, and Krimmel (2011). *Journal of Applied Psychology*, *97*(4), 900–900. https://doi.org/10.1037/a0029022

Chiu, C., Dweck, C. S., Tong, J. Y., & Fu, J. H. (1997). Implicit theories and conceptions of morality. *Journal of Personality and Social Psychology*, *73*(5), 923–940. https://doi.org/10.1037/0022-3514.73.5.923

Costa, P. T., & McCrae, R. R. (1985). *The NEO Personality Inventory manual*. Psychological Assessment Resources.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO-PI-R) and NEO five-factor (NEO-FFI) inventory professional manual*. Psychological Assessment Resources, Inc.

Costantini, G., Saraulli, D., & Perugini, M. (2020). Uncovering the motivational core of traits: The case of conscientiousness. *European Journal of Personality*, *34*(6), 1073–1094. https://doi.org/10.1002/per.2237

Cutumisu, M., Brown, M. R. G., Fray, C., & Schmölzer, G. M. (2018). Growth mindset moderates the effect of the Neonatal Resuscitation Program on performance in a computer-based game training simulation. *Frontiers in Pediatrics*, *6*, 195. https://doi.org/10.3389/fped.2018.00195

Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, *22*(3), 491–517. https://doi.org/10.1017/S0140525X99002046

Diener, E., & Emmons, R. A. (1984). The independence of positive and negative affect. *Journal of Personality and Social Psychology*, *47*(5), 1105–1117. https://doi.org/10.1037/0022-3514.47.5.1105

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*(2), 276–302. https://doi.org/10.1037/0033-2909.125.2.276

Do, M. H., & Minbashian, A. (2014). A meta-analytic examination of the effects of the agentic and affiliative aspects of extraversion on leadership outcomes. *The Leadership Quarterly*, *25*(5), 1040–1053. https://doi.org/10.1016/j.leaqua.2014.04.004

Dunlop, P. D., Telford, A. D., & Morrison, D. L. (2012). Not too little, but not too much: The perceived desirability of responses to personality items. *Journal of Research in Personality*, *46*(1), 8–18. https://doi.org/10.1016/j.jrp.2011.10.004

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Psychology Press.

Dweck, C. S. (2012). Implicit theories. In P. Van Lange, A. Kruglanski, & E. Higgins, *Handbook of Theories of Social Psychology* (pp. 43–61). SAGE Publications Ltd. https://doi.org/10.4135/9781446249222.n28

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*(2), 256–273. https://doi.org/10.1037/0033-295X.95.2.256

Dweck, C. S., & Yeager, D. S. (2019). Mindsets: A view from two eras. *Perspectives on Psychological Science*, *14*(3), 481–496. https://doi.org/10.1177/1745691618804166

Eder, L. (2022, February 9). Freedom Days: Diese Länder schaffen alle Corona-Maßnahmen ab. *SWR3*. https://www.swr3.de/aktuell/coronavirus/laender-corona-beschraenkungen-freedom-day-100.html

Erdley, C. A., Loomis, C. C., Cain, K. M., & Dumas-Hines, F. (1997). Relations among children's social goals, implicit personality theories, and responses to social failure. *Developmental Psychology*, *33*(2), 263–272. https://doi.org/10.1037/0012-1649.33.2.263

Evans, A. M., Meyers, M. C., De Calseyde, P. P. F. M. V., & Stavrova, O. (2021). Extroversion and conscientiousness predict deteriorating job outcomes during the COVID-19 transition to enforced remote work. *Social Psychological and Personality Science*. https://doi.org/10.1177/19485506211039092

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fletcher, J. M. (2013). The effects of personality traits on adult labor market outcomes: Evidence from siblings. *Journal of Economic Behavior & Organization*, *89*, 122–135. https://doi.org/10.1016/j.jebo.2013.02.004

Flüter-Hoffmann, C., & Stettes, O. (2022). *Homeoffice nach fast zwei Jahren Pandemie* (No. 02/2022; IW-Report, pp. 1–57). Institut der deutschen Wirtschaft. https://www.iwkoeln.de/studien/christiane-flueter-hoffmann-oliver-stettes-homeoffice-nach-fast-zwei-jahren-pandemie.html

Fraley, R. C., & Roberts, B. W. (2005). Patterns of continuity: A dynamic model for conceptualizing the stability of individual differences in psychological constructs across the life course. *Psychological Review*, *112*(1), 60–74. https://doi.org/10.1037/0033-295X.112.1.60

Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Integrative literaturereview: Motivation to transfer training: An integrative literature review. *Human Resource Development Review*, *8*(3), 403–423. https://doi.org/10.1177/1534484309335970

Gensowski, M. (2018). Personality, IQ, and lifetime earnings. *Labour Economics*, *51*, 170–183. https://doi.org/10.1016/j.labeco.2017.12.004

Goldberg, L. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of Personality and Social Psychology* (pp. 141–165). Sage Publication.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, *24*(6), 645–662. https://doi.org/10.1016/j.appdev.2003.09.002

Gutshall, C. A. (2013). Teachers' mindsets for students with and without disabilities: Mindset: A theoretical construct. *Psychology in the Schools*, *50*(10), 1073–1083. https://doi.org/10.1002/pits.21725

Haan, N., Millsap, R., & Hartka, E. (1986). As time goes by: Change and stability in personality over fifty years. *Psychology and Aging*, *1*(3), 220–232. https://doi.org/10.1037/0882-7974.1.3.220

Haimovitz, K., & Dweck, C. S. (2016). Parents' views of failure predict children's fixed and growth intelligence mind-sets. *Psychological Science*, *27*(6), 859–869. https://doi.org/10.1177/0956797616639727

Han, S. J., & Stieha, V. (2020). Growth mindset for human resource development: A scoping review of the literature with recommended interventions. *Human Resource Development Review*, *19*(3), 309–331. https://doi.org/10.1177/1534484320939739

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press.

Heineck, G., & Anger, S. (2010). The returns to cognitive abilities and personality traits in Germany. *Labour Economics*, *17*(3), 535–546. https://doi.org/10.1016/j.labeco.2009.06.001

Heise, D. R. (1969). Separating reliability and stability in test-retest correlation. *American Sociological Review*, *34*(1), 93–101. https://doi.org/10.2307/2092790

Helson, R., Kwan, V. S. Y., John, O. P., & Jones, C. (2002). The growing evidence for personality change in adulthood: Findings from research with personality inventories. *Journal of Research in Personality*, *36*(4), 287–306. https://doi.org/10.1016/S0092-6566(02)00010-7

Hennecke, M., Bleidorn, W., Denissen, J. J. A., & Wood, D. (2014). A three–part framework for self–regulated personality development across adulthood. *European Journal of Personality*, *28*(3), 289–299. https://doi.org/10.1002/per.1945

Herringer, L. G. (1998). Facets of extraversion related to life satisfaction. *Personality and Individual Differences*, *24*(5), 731–733. https://doi.org/10.1016/S0191-8869(97)00194-3

Heslin, P. A., Keating, L. A., & Minbashian, A. (2019). How situational cues and mindset dynamics shape personality effects on career outcomes. *Journal of Management*, *45*(5), 2101–2131. https://doi.org/10.1177/0149206318755302

Heslin, P. A., Latham, G. P., & VandeWalle, D. (2005). The effect of implicit person theory on performance appraisals. *Journal of Applied Psychology*, *90*(5), 842–856. https://doi.org/10.1037/0021-9010.90.5.842

Heslin, P. A., Vandewalle, D., & Latham, G. P. (2006). Keen to help? Managers' implicit person theories and their subsequent employee coaching. *Personnel Psychology*, *59*(4), 871–902. https://doi.org/10.1111/j.1744-6570.2006.00057.x

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319–340. https://doi.org/10.1037/0033-295X.94.3.319

Hong, Y., Chiu, C., Dweck, C. S., Lin, D. M.-S., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology*, *77*(3), 588–599. https://doi.org/10.1037/0022-3514.77.3.588

Hoyt, C. L., Burnette, J. L., & Innella, A. N. (2012). I can do that: The impact of implicit
     theories on leadership role model effectiveness. *Personality and Social Psychology
     Bulletin*, *38*(2), 257–268. https://doi.org/10.1177/0146167211427922

Hudson, N. W. (2021). Dynamics and processes in personality change interventions. In J. F.
     Rauthmann (Ed.), *The handbook of personality dynamics and processes* (pp. 1273–
     1295). Elsevier. https://doi.org/10.1016/B978-0-12-813995-0.00050-9

Hudson, N. W., Briley, D. A., Chopik, W. J., & Derringer, J. (2019). You have to follow
     through: Attaining behavioral change goals predicts volitional personality change.
     Journal of Personality and Social Psychology, *117*(4), 839–857.
     https://doi.org/10.1037/pspp0000221

Hudson, N. W., Chopik, W. J., & Briley, D. A. (2020). Volitional change in adult attachment:
     Can people who want to become less anxious and avoidant move closer towards
     realizing those goals? *European Journal of Personality*, *34*(1), 93–114.
     https://doi.org/10.1002/per.2226

Hudson, N. W., Derringer, J., & Briley, D. A. (2019). Do people know how they've changed?
     A longitudinal investigation of volitional personality change and participants'
     retrospective perceptions thereof. *Journal of Research in Personality*, *83*, 103879.
     https://doi.org/10.1016/j.jrp.2019.103879

Hudson, N. W., & Fraley, R. C. (2015). Volitional personality trait change: Can people
     choose to change their personality traits? *Journal of Personality and Social
     Psychology*, *109*(3), 490–507. https://doi.org/10.1037/pspp0000021

Hudson, N. W., & Fraley, R. C. (2016a). Changing for the better? Longitudinal associations
     between volitional personality change and psychological well-being. *Personality and
     Social Psychology Bulletin*, *42*(5), 603–615.
     https://doi.org/10.1177/0146167216637840

Hudson, N. W., & Fraley, R. C. (2016b). Do people's desires to change their personality
     traits vary with age? An examination of trait change goals across adulthood. *Social
     Psychological and Personality Science*, *7*(8), 847–856.
     https://doi.org/10.1177/1948550616657598

Hudson, N. W., & Fraley, R. C. (2017). Volitional personality change. In J. Specht (Ed.),
     Personality development across the lifespan (pp. 555–571). Elsevier.
     https://doi.org/10.1016/B978-0-12-804674-6.00033-8

Hudson, N. W., Fraley, R. C., Briley, D. A., & Chopik, W. J. (2021). Your personality does
     not care whether you believe it can change: Beliefs about whether personality can

change do not predict trait change among emerging adults. *European Journal of Personality*, *35*(3), 340–357. https://doi.org/10.1002/per.2289

Hudson, N. W., Fraley, R. C., Chopik, W. J., & Briley, D. A. (2020). Change goals robustly predict trait growth: A Mega-Analysis of a dozen intensive longitudinal studies examining volitional change. *Social Psychological and Personality Science*, *11*(6), 723–732. https://doi.org/10.1177/1948550619878423

Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality*, *53*, 68–83. https://doi.org/10.1016/j.jrp.2014.08.008

Hudson, N. W., & Roberts, B. W. (2016). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith (2012). *Journal of Research in Personality*, *60*, 12–23. https://doi.org/10.1016/j.jrp.2015.09.004

Hudson, N. W., Roberts, B. W., & Lodi-Smith, J. (2012). Personality trait development and social investment in work. *Journal of Research in Personality*, *46*(3), 334–344. https://doi.org/10.1016/j.jrp.2012.03.002

Indeed Editorial Team. (2021, February 23). 18 ways to be more extroverted at work. *Indeed*. https://www.indeed.com/career-advice/career-development/how-to-be-an-extrovert#:~:text=Seek%20social%20situations%3A%20Extroverts%20often,being%20the%20center%20of%20attention.

Jach, H. K., Sun, J., Loton, D., Chin, T.-C., & Waters, L. E. (2017). Strengths and subjective wellbeing in adolescence: Strength-based parenting and the moderating effect of mindset. *Journal of Happiness Studies*, *19*. https://doi.org/10.1007/s10902-016-9841-y

Jelley, R. B. (2021). Using personality feedback for work-related development and performance improvement: A rapid evidence assessment. *Canadian Journal of Behavioural Science*, *53*(2), 175–186. https://doi.org/10.1037/cbs0000230

Job, V., Dweck, C. S., & Walton, G. M. (2010). Ego depletion—Is it all in your head? Implicit theories about willpower affect self-regulation. *Psychological Science*, *21*(11), 1686–1693. https://doi.org/10.1177/0956797610384745

Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, *87*(4), 765–780. https://doi.org/10.1037/0021-9010.87.4.765

Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The Big Five personality traits, general mental ability, and carreer success across the life span. *Personnel Psychology*, *52*(3), 621–652. https://doi.org/10.1111/j.1744-6570.1999.tb00174.x

Jung, C. G. (1990). *Psychological Types: The collected works of C.G. Jung* (W. McGuire, Ed.; 9. ed.). University Press.

Kammrath, L. K., & Dweck, C. (2006). Voicing conflict: Preferred conflict strategies among incremental and entity theorists. *Personality and Social Psychology Bulletin*, *32*(11), 1497–1508. https://doi.org/10.1177/0146167206291476

Kasper, B. (2019, May 4). Leadership-Persönlichkeit: Trainieren Sie Ihre Stärken auf Führung 4.0. *Boris Kasper*. https://boriskasper.de/progress-professionals/blog/leadership-personlichkeit-auf-fuhrung-trainieren

Kiecolt, K. J. (1994). Stress and the decision to change oneself: A theoretical model. *Social Psychology Quarterly*, *57*(1), 49–63. https://doi.org/10.2307/2786974

Knee, C. R., Patrick, H., & Lonsbary, C. (2003). Implicit theories of relationships: Orientations toward evaluation and cultivation. *Personality and Social Psychology Review*, *7*(1), 41–55. https://doi.org/10.1207/S15327957PSPR0701_3

Kray, L. J., & Haselhuhn, M. P. (2007). Implicit negotiation beliefs and performance: Experimental and longitudinal evidence. *Journal of Personality and Social Psychology*, *93*(1), 49–64. https://doi.org/10.1037/0022-3514.93.1.49

Langvik, E., Karlsen, H. R., Saksvik-Lehouillier, I., & Sørengaard, T. A. (2021). Police employees working from home during COVID-19 lockdown: Those with higher score on extraversion miss their colleagues more and are more likely to socialize with colleagues outside work. *Personality and Individual Differences*, *179*, Article 110924. https://doi.org/10.1016/j.paid.2021.110924

Lazazzara, A., Karpinska, K., & Henkens, K. (2013). What factors influence training opportunities for older workers? Three factorial surveys exploring the attitudes of HR professionals. *The International Journal of Human Resource Management*, *24*(11), 2154–2172. https://doi.org/10.1080/09585192.2012.725077

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-term effects of social investment: The case of partnering in young adulthood. *Journal of Personality*, *78*(2), 639–670. https://doi.org/10.1111/j.1467-6494.2010.00629.x

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and

volunteerism. *Personality and Social Psychology Review*, *11*(1), 68–86. https://doi.org/10.1177/1088868306294590

Lukaszewski, A. W. (2016). Extraversion. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences* (pp. 1–6). Springer International Publishing. https://doi.org/10.1007/978-3-319-28099-8_1071-1

Lundgren, H., Kroon, B., & Poell, R. F. (2019). Pigeonholing or learning instrument? Test takers' reactions to personality testing in management development. *European Journal of Training and Development*, *43*(3/4), 354–374. https://doi.org/10.1108/EJTD-09-2018-0091

Magidson, J. F., Roberts, B. W., Collado-Rodriguez, A., & Lejuez, C. W. (2014). Theory-driven intervention for changing personality: Expectancy value theory, behavioral activation, and conscientiousness. *Developmental Psychology*, *50*(5), 1442–1450. https://doi.org/10.1037/a0030583

Major, D. A., Turner, J. E., & Fletcher, T. D. (2006). Linking proactive personality and the Big Five to motivation to learn and development activity. *Journal of Applied Psychology*, *91*(4), 927–935. https://doi.org/10.1037/0021-9010.91.4.927

Margolis, S., & Lyubomirsky, S. (2020). Experimental manipulation of extraverted and introverted behavior and its effects on well-being. *Journal of Experimental Psychology: General*, *149*(4), 719–731. https://doi.org/10.1037/xge0000668

Marinova, S. V., Peng, C., Lorinkova, N., Van Dyne, L., & Chiaburu, D. (2015). Change-oriented behavior: A meta-analysis of individual and job design predictors. *Journal of Vocational Behavior*, *88*, 104–120. https://doi.org/10.1016/j.jvb.2015.02.006

Martin-Allan, J., Leeson, P., & Martin, L. S. (2019). Intentional personality change coaching: A four-year longitudinal study. *International Coaching Psychology Review*, *14*(2), 44–56.

McCabe, K. O., & Fleeson, W. (2012). What Is extraversion for? Integrating trait and motivational perspectives and identifying the purpose of extraversion. *Psychological Science*, *23*(12), 1498–1505. https://doi.org/10.1177/0956797612444904

McCrae, R. R., Costa, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., Sanz, J., Sánchez-Bernardos, M. L., Kusdil, M. E., Woodfield, R., Saunders, P. R., & Smith, P. B. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology*, *78*(1), 173–186. https://doi.org/10.1037/0022-3514.78.1.173

Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review*, *80*(4), 252–283. https://doi.org/10.1037/h0035002

Myers, C. A., Wang, C., Black, J. M., Bugescu, N., & Hoeft, F. (2016). The matter of motivation: Striatal resting-state connectivity is dissociable between grit and growth mindset. *Social Cognitive and Affective Neuroscience*, *11*(10), 1521–1527. https://doi.org/10.1093/scan/nsw065

Naquin, S. S., & Holton, E. F. (2002). The effects of personality, affectivity, and work commitment on motivation to improve work through learning. *Human Resource Development Quarterly*, *13*(4), 357–376. https://doi.org/10.1002/hrdq.1038

Neyer, F. J., & Asendorpf, J. B. (2001). Personality–relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, *81*(6), 1190–1204. https://doi.org/10.1037/0022-3514.81.6.1190

Neyer, F. J., & Asendorpf, J. B. (2012). Persönlichkeitsbereiche. In J. B. Asendorpf & F. J. Neyer, *Psychologie der Persönlichkeit* (pp. 131–225). Springer. https://doi.org/10.1007/978-3-642-30264-0_4

Nick Cochran, R., vanDellen, M. R., & Haas, B. W. (2021). How did I get here? Individual differences in perceived retrospective personality change. *Journal of Research in Personality*, *90*, Article 104039. https://doi.org/10.1016/j.jrp.2020.104039

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education*, *15*(5), 625–632. https://doi.org/10.1007/s10459-010-9222-y

Nyhus, E. K., & Pons, E. (2005). The effects of personality on earnings. *Journal of Economic Psychology*, *26*(3), 363–384. https://doi.org/10.1016/j.joep.2004.07.001

O'Connell, M., & Sheikh, H. (2011). 'Big Five' personality dimensions and social attainment: Evidence from beyond the campus. *Personality and Individual Differences*, *50*(6), 828–833. https://doi.org/10.1016/j.paid.2011.01.004

O'Keefe, P. A., Dweck, C. S., & Walton, G. M. (2018). Implicit theories of interest: Finding your passion or developing it? *Psychological Science*, *29*(10), 1653–1664. https://doi.org/10.1177/0956797618780643

Ostendorf, F., & Angleitner, A. (2003). *NEO-Persönlichkeitsinventar (revidierte Form, NEO-PI-R nach Costa und McCrae)*. Hogrefe.

Özduran, A., & Tanova, C. (2017). Manager mindsets and employee organizational citizenship behaviours. *International Journal of Contemporary Hospitality Management*, *29*(1), 589–606. https://doi.org/10.1108/IJCHM-03-2016-0141

Pace, V. L., & Brannick, M. T. (2010). How similar are personality scales of the "same" construct? A meta-analytic investigation. *Personality and Individual Differences*, *49*(7), 669–676. https://doi.org/10.1016/j.paid.2010.06.014

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality*, *70*, 214–228. https://doi.org/10.1016/j.jrp.2017.08.001

Rangel, J. G. C., King, M., & Muldner, K. (2020). An incremental mindset intervention increases effort during programming activities but not performance. *ACM Transactions on Computing Education*, *20*(2), 1–18. https://doi.org/10.1145/3377427

Rattan, A., & Dweck, C. S. (2018). What happens after prejudice is confronted in the workplace? How mindsets affect minorities' and women's outlook on future social relations. *Journal of Applied Psychology*, *103*(6), 676–687. https://doi.org/10.1037/apl0000287

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, *126*(1), 3–25. https://doi.org/10.1037/0033-2909.126.1.3

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*(1), 1–25. https://doi.org/10.1037/0033-2909.132.1.1

Roberts, B. W., & Wood, D. (2014). Personality development in the context of the Neo-Socioanalytic Model of Personality. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of Personality Development*. Routledge. https://doi.org/10.4324/9781315805610.ch2

Robins, R. W., & Pals, J. L. (2002). Implicit self-theories in the academic domain: Implications for goal orientation, attributions, affect, and self-esteem change. *Self and Identity*, *1*(4), 313–336. https://doi.org/10.1080/15298860290106805

Robinson, O. C., Noftle, E. E., Guo, J., Asadi, S., & Zhang, X. (2015). Goals and plans for Big Five personality trait change in young adults. *Journal of Research in Personality*, *59*, 31–43. https://doi.org/10.1016/j.jrp.2015.08.002

Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations: Mediation analysis in social psychology. *Social and Personality Psychology Compass*, *5*(6), 359–371. https://doi.org/10.1111/j.1751-9004.2011.00355.x

Ryan, A. M., & Ployhart, R. E. (2000). Applicants' perceptions of selection procedures and decisions: A critical review and agenda for the future. *Journal of Management*, *26*(3), 565–606. https://doi.org/10.1177/014920630002600308

Saksvik, I. B., & Hetland, H. (2009). Exploring dispositional resistance to change. *Journal of Leadership & Organizational Studies*, *16*(2), 175–183. https://doi.org/10.1177/1548051809335357

Sander, V. (2019, August 27). *25 tips to be more extraverted (Without losing who you are)*. https://socialpronow.com/blog/introverts-becoming-extroverted/

Schleider, J., & Weisz, J. (2018). A single-session growth mindset intervention for adolescent anxiety and depression: 9-month outcomes of a randomized trial. *Journal of Child Psychology and Psychiatry*, *59*(2), 160–170. https://doi.org/10.1111/jcpp.12811

Schreiber, M., Job, V., & Dohle, S. (2020). Is your health malleable or fixed? The influence of implicit theories on health-related attitudes and behaviour. *Psychology & Health*, *35*(12), 1421–1439. https://doi.org/10.1080/08870446.2020.1761975

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, *91*(6), 1152–1165. https://doi.org/10.1037/0022-3514.91.6.1152

Seibert, S. E., & Kraimer, M. L. (2001). The Five-Factor Model of Personality and Career Success. *Journal of Vocational Behavior*, *58*(1), 1–21. https://doi.org/10.1006/jvbe.2000.1757

Shapcott, S., & Carr, S. (2020). Golf coaches' mindsets about recreational golfers: Gendered golf experiences start on the practice tee. *Motivation Science*, *6*(3), 275–284. https://doi.org/10.1037/mot0000154

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology*, *113*(1), 117–143. https://doi.org/10.1037/pspp0000096

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, *100*(2), 330–348. https://doi.org/10.1037/a0021717

Spinath, B., Spinath, F. M., Riemann, R., & Angleitner, A. (2003). Implicit theories about personality and intelligence and their relationship to actual personality and

intelligence. *Personality and Individual Differences*, *35*(4), 939–951.
https://doi.org/10.1016/S0191-8869(02)00310-0

Srivastava, S., John, O. P., Gosling, S. D., & Potter, J. (2003). Development of personality in
early and middle adulthood: Set like plaster or persistent change? *Journal of
Personality and Social Psychology*, *84*(5), 1041–1053. https://doi.org/10.1037/0022-
3514.84.5.1041

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and
subjective well-being. *Psychological Bulletin*, *134*(1), 138–161.
https://doi.org/10.1037/0033-2909.134.1.138

Stieger, M., Flückiger, C., Rüegger, D., Kowatsch, T., Roberts, B. W., & Allemand, M.
(2021). Changing personality traits with the help of a digital personality change
intervention. *Proceedings of the National Academy of Sciences*, *118*(8), Article
e2017548118. https://doi.org/10.1073/pnas.2017548118

Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007). Implicit theories of emotion:
Affective and social outcomes across a major life transition. *Journal of Personality
and Social Psychology*, *92*(4), 731–744. https://doi.org/10.1037/0022-3514.92.4.731

Taylor, P., & Urwin, P. (2001). Age and participation in vocational education and training.
Work, Employment and Society, *15*(4), 763–779.
https://doi.org/10.1177/095001701400438198

Terracciano, A., McCrae, R. R., Brant, L. J., & Costa, P. T. (2005). Hierarchical linear
modeling analyses of the NEO-PI-R Scales in the Baltimore Longitudinal Study of
Aging. *Psychology and Aging*, *20*(3), 493–506. https://doi.org/10.1037/0882-
7974.20.3.493

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job
performance. *Journal of Applied Psychology*, *88*(3), 500–517.
https://doi.org/10.1037/0021-9010.88.3.500

Tett, R. P., & Guterman, H. A. (2000). Situation trait relevance, trait expression, and cross-
situational consistency: Testing a principle of trait activation. *Journal of Research in
Personality*, *34*(4), 397–423. https://doi.org/10.1006/jrpe.2000.2292

Thielmann, I., & de Vries, R. E. (2021). Who wants to change and how? On the trait-
specificity of personality change goals. *Journal of Personality and Social Psychology*,
121(5), 1112–1139. https://doi.org/10.1037/pspp0000304

Turiano, N. A., Pitzer, L., Armour, C., Karlamangla, A., Ryff, C. D., & Mroczek, D. K.
(2012). Personality trait level and change as predictors of health outcomes: Findings

from a national study of Americans (MIDUS). *The Journals of Gerontology: Series B*, *67B*(1), 4–12. https://doi.org/10.1093/geronb/gbr072

Vukasović, T., & Bratko, D. (2015). Heritability of personality: A meta-analysis of behavior genetic studies. *Psychological Bulletin*, *141*(4), 769–785. https://doi.org/10.1037/bul0000017

Wagner, J., Orth, U., Bleidorn, W., Hopwood, C. J., & Kandler, C. (2020). Toward an integrative model of sources of personality stability and change. *Current Directions in Psychological Science*, *29*(5), 438–444. https://doi.org/10.1177/0963721420924751

Wang, S., Dai, J., Li, J., Wang, X., Chen, T., Yang, X., He, M., & Gong, Q. (2018). Neuroanatomical correlates of grit: Growth mindset mediates the association between gray matter structure and trait grit in late adolescence. *Human Brain Mapping*, *39*(4), 1688–1699. https://doi.org/10.1002/hbm.23944

Wihler, A., Meurs, J. A., Wiesmann, D., Troll, L., & Blickle, G. (2017). Extraversion and adaptive performance: Integrating trait activation and socioanalytic personality theories at work. *Personality and Individual Differences*, *116*, 133–138. https://doi.org/10.1016/j.paid.2017.04.034

Wille, B., Hofmans, J., Feys, M., & De Fruyt, F. (2014). Maturation of work attitudes: Correlated change with big five personality traits and reciprocal effects over 15 years: Maturation of work attitudes. *Journal of Organizational Behavior*, *35*(4), 507–529. https://doi.org/10.1002/job.1905

Wilmot, M. P., Wanberg, C. R., Kammeyer-Mueller, J. D., & Ones, D. S. (2019). Extraversion advantages at work: A quantitative review and synthesis of the meta-analytic evidence. *Journal of Applied Psychology*, *104*(12), 1447–1470. https://doi.org/10.1037/apl0000415

Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, *47*(4), 302–314. https://doi.org/10.1080/00461520.2012.722805

Yeager, D. S., & Dweck, C. S. (2020). What can be learned from growth mindset controversies? *American Psychologist*, *75*(9), 1269–1284. https://doi.org/10.1037/amp0000794

Yeager, D. S., Johnson, R., Spitzer, B. J., Trzesniewski, K. H., Powers, J., & Dweck, C. S. (2014). The far-reaching effects of believing people can change: Implicit theories of personality shape stress, health, and achievement during adolescence. *Journal of*

Personality and Social Psychology, *106*(6), 867–884.
https://doi.org/10.1037/a0036335

Yeager, D. S., Lee, H. Y., & Jamieson, J. P. (2016). How to improve adolescent stress
responses: Insights from integrating implicit theories of personality and
biopsychosocial models. *Psychological Science*, *27*(8), 1078–1091.
https://doi.org/10.1177/0956797616649604

Yeager, D. S., Romero, C., Paunesku, D., Hulleman, C. S., Schneider, B., Hinojosa, C., Lee,
H. Y., O'Brien, J., Flint, K., Roberts, A., Trott, J., Greene, D., Walton, G. M., &
Dweck, C. S. (2016). Using design thinking to improve psychological interventions:
The case of the growth mindset during the transition to high school. *Journal of
Educational Psychology*, *108*(3), 374–391. https://doi.org/10.1037/edu0000098

Yeager, D. S., Trzesniewski, K. H., & Dweck, C. S. (2013). An implicit theories of
personality intervention reduces adolescent aggression in response to victimization
and exclusion. *Child Development*, *84*(3), 970–988.
https://doi.org/10.1111/cdev.12003

Zeng, G., Chen, X., Cheung, H. Y., & Peng, K. (2019). Teachers' growth mindset and work
engagement in the Chinese educational context: Well-being and perseverance of effort
as mediators. *Frontiers in Psychology*, *10*, Article 839.
https://doi.org/10.3389/fpsyg.2019.00839

List of Figures

List of Tables

Appendix A – Abstracts

Abstract

Background: Extraverts enjoy various advantages in today's world of work. Many people also want to change their extraversion. As a change goal of extraversion is dependent on the extraversion level and the assumptions held about it's changeability (mindset), manipulating the mindset could foster a change goal. It's hypothized that, if a growth mindset of extraversion is induced, the change goal of extraversion in a social setting is higher than if a fixed mindset is induced (H1). Introverts are hypothized to have a higher change goal of extraversion than extraverts (H2). As previous research theorized that growth mindset introverts' change goal can be boosted if a situation is cued in an extraverted manner, extraversion is hypothized to moderate the effect of a mindset of extraversion induction on the change goal (H3).

Method: An experimental, between subjects design with post-test was used. The 290 participants were put in two groups, inducing a growth or fixed mindset via a short text. Important measures (german) were extraversion, satisfaction with extraversion, change goal in a social setting and age.

Results: The change goal was significantly higher in the growth mindset group (H1). Hypothesis 2 and 3 could not be confirmed. Satisfaction with extraversion played a significantly mediating role between extraversion and change goal. Age was marginally significant and negatively related to change goal.

Implications: Effectiveness of a short mindset manipulation was shown, which could affect actual extraversion change. The results can be used for HR development for example in order to boost job fit.

Key words: growth mindset, extraversion, change goal of extraversion, satisfaction with extraversion

Zusammenfassung

Hintergrund: Extravertierte Menschen genießen verschiedenste Vorteile in der heutigen Arbeitswelt. Viele von ihnen wollen ihre Extraversion auch ändern. Da dieses *Change Goal* der Extraversion von der Ausprägung der Extraversion und der Meinung über dessen Veränderbarkeit abhängt (Mindset), könnte eine Manipulation des Mindsets das Change Goal verstärken. Es wird erwartet, dass nach einer Growth Mindset Intervention der Extraversion das Change Goal der Extraversion in einem sozialen Setting höher ist als bei einer Fixed Mindset Intervention (H1). Zudem wird vermutet, dass Introvertierte ein höheres Change Goal der Extraversion haben (H2). Da die Forschung theoretisiert, dass das Change Goal von Introvertierten mit Growth Mindset besonders verstärkt wird, wenn eine Situation als extravertiert anzusehen ist, wird erwartet, dass Extraversion den Effekt der Intervention auf das Change Goal moderiert (H3).

Methode: Ein experimentelles, *Between-Subjects-Design* mit Post-Test wurde verwendet. Die 290 Teilnehmer*innen wurden in zwei Gruppen eingeteilt, wo mithilfe eines kurzen Textes ein Growth bzw. ein Fixed Mindset induziert wurde. Wichtige Maße (Deutsch) waren Extraversion, die Zufriedenheit mit der Extraversion, Change Goal in einem sozialen Setting und Alter.

Ergebnisse: Das Change Goal war signifikant höher in der Growth Mindset Gruppe (H1). Hypothese 2 und 3 konnten nicht bestätigt werden. Die Zufriedenheit mit der Extraversion mediierte den Zusammenhang zwischen Extraversion und Change Goal signifikant. Alter stand in einem marginal signifikanten, negativen Zusammenhang mit dem Change Goal.

Implikationen: Die Effektivität einer kurzen Mindsetmanipulation wurde gezeigt, welche wiederum echte Extraversionsveränderung bewirken könnte. Die Ergebnisse können für die Personalentwicklung benutzt werden, um beispielsweise den Job-Fit zu erhöhen.

Schlüsselwörter: Growth Mindset, Extraversion, Change Goal der Extraversion, Zufriedenheit mit Extraversion

Appendix B – Materials

Growth Mindset Induction

Lesen Sie sich nun bitte den folgenden Text aufmerksam durch!

Extravertierte Personen sind gesellig, gesprächig, durchsetzungsfähig, enthusiastisch, sensationslustig und aktiv. Introvertierte Personen hingegen sind Menschen mit einer niedrigen Ausprägung an Extraversion.

Michael Wilmot und sein Team von Wissenschafter*innen der Universität Toronto Scarborough haben ca. 100 Studien zum Thema Extraversion am Arbeitsplatz analysiert. Sie haben herausgefunden, dass Extraversion in der heutigen Arbeitswelt motivationale, emotionale, zwischenmenschliche und leistungsbezogene Vorteile bietet. Andere Studien bestätigen diese Vorteile. Extravertierte Menschen sind öfter in Führungspositionen, treffen sich öfter mit den Kolleg*innen auch außerhalb der Arbeitszeit und verdienen über das ganze Leben gesehen mehr als introvertierte Menschen.

Kann man nun die eigene Extraversion erhöhen, um diese Vorteile auch zu genießen? Ja. Die Forschung hat gezeigt, dass man die eigene Extraversion verändern kann.

Extraversion ist wie ein Muskel, der trainiert werden kann. Dieses Training ist aber nicht so anstrengend, wie ein Aufenthalt im Fitnessstudio. Immer mehr Menschen sind daher dazu bereit, ihre Ausprägung an Extraversion anzukurbeln.

 Ein paar strategische Tipps:
- Meiden Sie Ihr Telefon, wenn andere in der Nähe sind!
- Finden Sie heraus, was andere interessant finden!
- Reden Sie über Ihre eigenen Interessen!

Fixed Mindst Induction

Lesen Sie sich nun bitte den folgenden Text aufmerksam durch!

Extravertierte Personen sind gesellig, gesprächig, durchsetzungsfähig, enthusiastisch, sensationslustig und aktiv. Introvertierte Personen hingegen sind Menschen mit einer niedrigen Ausprägung an Extraversion.

Michael Wilmot und sein Team von Wissenschafter*innen der Universität Toronto Scarborough haben ca. 100 Studien zum Thema Extraversion am Arbeitsplatz analysiert. Sie haben herausgefunden, dass Extraversion in der heutigen Arbeitswelt motivationale, emotionale, zwischenmenschliche und leistungsbezogene Vorteile bietet. Andere Studien bestätigen diese Vorteile. Extravertierte Menschen sind öfter in Führungspositionen, treffen sich öfter mit den Kolleg*innen auch außerhalb der Arbeitszeit und verdienen über das ganze Leben gesehen mehr als introvertierte Menschen.

Kann man nun die eigene Extraversion erhöhen, um diese Vorteile auch zu genießen? Nein. Die Forschung hat gezeigt, dass man die eigene Extraversion nicht verändern kann.

Extraversion kann also nicht wie ein Muskel einfach trainiert werden. Immer mehr Menschen sind aber dazu bereit, Ihre Ausprägung an Extraversion zu akzeptieren.

Ein paar strategische Tipps:
- Sie können Ihr Telefon benutzen, wenn Sie sich in einer sozialen Situation unwohl fühlen!
- Sie müssen sich nicht für die Interessen Anderer interessieren!
- Sie müssen nicht über Dinge reden, die Sie nicht preisgeben wollen!

Saying-is-believing Task

Denken Sie nun bitte an eine Situation in Ihrem Leben, in der Sie mehr Extraversion gebraucht hätten, um ein Ziel zu erreichen. Schreiben Sie zumindest einen kurzen Satz!

Extraversion Feedback

Die Ausprägung Ihrer Extraversion beträgt %.

Je näher Sie beim Wert 100% liegen, desto extravertierter sind Sie.

Je näher Sie beim Wert 0% liegen, desto introvertierter sind Sie.

Extraversion Training Flyer

Ihr*e derzeitige*r oder zukünftige*r Arbeitgeber*in bietet Ihnen die Möglichkeit, an diesem Gruppentraining teilzunehmen, um Ihre Extraversion zu steigern. Bitte lesen Sie sich den folgenden Flyer durch!

Laden Sie Ihre sozialen Batterien! – Extraversions-Training

Finden Sie Ihre innere Extraversion um Ihrer Karriere und Ihrem gesamten Leben einen Schub zu verpassen!

Viele Menschen haben ihre Mühen in der heutigen Arbeitswelt, da immer öfter ein gewisses Maß an Extraversion gefordert wird, um tägliche Herausforderungen zu meistern….

…Team Meetings – täglich neue Gesichter – Open Offices – und so weiter…

Um diesen Erwartungen gerecht zu werden und erfolgreich zu sein, haben wir ein spezielles, wissenschaftlich-fundiertes Extraversions-Training entwickelt. Wir sind ein Team aus Coaches, Psycholog*innen und Unternehmensberater*innen und wir sind hier um Ihnen Strategien zu zeigen, die Ihre innere Extraversion ans Tageslicht bringen!

Unser Team-Training dauert nur einen Tag. Danach haben Sie das Rüstzeug zum Erfolg!

Melden Sie sich jetzt an, um Ihre sozialen Batterien aufzuladen!

Debriefing

Diese Untersuchung beschäftigt sich mit den Auswirkungen von impliziten Theorie der Persönlichkeit. Implizite Theorien der Persönlichkeit beschäftigen sich mit zwei gegensätzlichen Ansichten, die Menschen über die Veränderbarkeit von beispielsweise Extraversion haben. Menschen mit einem Growth Mindset der Persönlichkeit glauben an die Veränderbarkeit von Extraversion, im Gegensatz zu Menschen mit einem Fixed Mindset.

In dieser Studie soll untersucht werden, inwiefern die Information über die Veränderbarkeit bzw. Unveränderbarkeit von Extraversion ein Growth bzw. Fixed Mindset hervorruft. In weiterer Folge wird untersucht, inwiefern sich dieses Mindset auf ein sogenanntes Change Goal auswirkt. Das Change Goal ist hier, die Bereitschaft die eigene Extraversion im Rahmen eines Gruppentrainings zu erhöhen. Zusätzlich werden das Alter, die Extraversion und die Reaktion auf dessen Ausprägung erhoben, um herauszufinden, wie diese auf den Zusammenhang zwischen Mindset und Change Goal wirken.

Die vorgestellten Forschungsergebnisse von Michael Wilmot et al. (2019) entsprechen der Wahrheit. Sie haben herausgefunden, dass Extraversion in der heutigen Arbeitswelt motivationale, emotionale, zwischenmenschliche und leistungsbezogene Vorteile bietet. Seit der Coronapandemie gibt es aber Forschung die zeigt, dass durch die Social-Distancing Maßnahmen extravertierte Menschen unzufriedener mit ihrer Arbeit sind (Evans et al., 2021). Zudem ist für verschiedene Berufe ein verschiedenes Maß an Extraversion notwendig bzw. förderlich. Introversion ist nicht als etwas Schlechtes zu betrachten. Sie stellt lediglich den Gegenpol zu Extraversion dar.

Grundätzlich ist die Persönlichkeit per definitionem relativ stabil (Thielmann & De Vries, 2020), sie verändert sich aber über das Leben hinweg (Hudson et al., 2020). Menschen mit einem Growth Mindset sind motivierter ihre Persönlichkeit zu verändern. Die dabei entstehenden Change Goals können eine Veränderung in die gewünschte Richtung bewirken (Hudson et al., 2021; Stieger et al., 2021). Viele Menschen wollen dabei ihre Persönlichkeit verändern (Thielmann & De Vries, 2021) und schaffen dies auch bis zu einem gewissen Grad, unter anderem durch die Benutzung von Apps (Stieger et al., 2021).

Die in der Studie ausgewiesene Extraversion ist eine gängige Methode, um zeitsparend Extraversion zu messen. Dazu wurde der Fragebogen NEO-PI-R Domains von Costa & McCrae (1992) verwendet.

Literatur:

Evans, A. M., Meyers, M. C., De Calseyde, P. P. F. M. V., & Stavrova, O. (2021). Extroversion and conscientiousness predict deteriorating job outcomes during the COVID-19 transition to enforced remote work. *Social Psychological and Personality Science*, 194855062110390. https://doi.org/10.1177/19485506211039092

Costa, P. T., & MacCrae, R. R. (1992). Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) : professional manual (Rev..). Psychological Assessment Resources, Inc.

Hudson, N. W., Fraley, R. C., Briley, D. A., & Chopik, W. J. (2021). Your personality does not care whether you believe it can change: Beliefs about whether personality can change do not predict trait change among emerging adults. *European Journal of Personality*, 35(3), 340–357. https://doi.org/10.1002/per.2289

Stieger, M., Flückiger, C., Rüegger, D., Kowatsch, T., Roberts, B. W., & Allemand, M. (2021). Changing personality traits with the help of a digital personality change intervention. *Proceedings of the National Academy of Sciences*, 118(8), e2017548118. https://doi.org/10.1073/pnas.2017548118

Thielmann, I., & de Vries, R. E. (2021). Who wants to change and how? On the trait-specificity of personality change goals. *Journal of Personality and Social Psychology*, 121(5), 1112–1139. https://doi.org/10.1037/pspp0000304

Wilmot, M. P., Wanberg, C. R., Kammeyer-Mueller, J. D., & Ones, D. S. (2019). Extraversion advantages at work: A quantitative review and synthesis of the meta-analytic evidence. *Journal of Applied Psychology*, 104(12), 1447–1470. https://doi.org/10.1037/apl0000415

Bitte klicken Sie auf Weiter, um die Studie zu beenden und zu einer unabhängigen Seite zu gelangen, auf der Sie die Daten zur Teilnahme an der Verlosung eingeben können.

Appendix C - Measures

Table 4

All measures in chronological order

Construct	Item(s)	Answers	Source	*M/%*	*SD*	α
Consent	Hiermit versichere ich, dass ich die oben beschriebenen Teilnahmeinformationen gelesen habe und mit den genannten Teilnahmebedingungen einverstanden bin. Zusätzlich bestätige ich, dass ich das 18. Lebensjahr vollendet habe.	Choices: Ja; Nein				
Extraversion	Bitte benutzen Sie die folgende Skala, um anzugeben, wie stark Sie den einzelnen Aussagen zustimmen! Es gibt keine richtigen oder falschen Antworten. Ich fühle mich wohl in der Nähe von Menschen. Ich finde schnell Freunde. Ich bin geschickt im Umgang mit sozialen Situationen. Ich bin der Mittelpunkt einer Party. Ich weiß, wie man Menschen fasziniert. Ich habe wenig zu sagen. (R) Ich bleibe im Hintergrund. (R) Ich würde meine Erfahrungen als etwas langweilig bezeichnen. (R) Ich mag es nicht, auf mich aufmerksam zu machen. (R) Ich rede nicht viel. (R)	5-point Likert-Scale: 1 = *stimme überhaupt nicht zu* 2 3 4 5 = *stimme voll und ganz zu*	Costa & McCrae 1992)	0.52	0.18	.87
Attention Check 1	Was sagte der Text über extravertierte Menschen?	1. Sie sind erfolgreicher am Arbeitsplatz als				

		Introverierte Menschen. 2. Sie sind weniger erfolgreich am Arbeitsplatz als Introverierte Menschen.				
Attention Check 2	Welche Aussage stimmt, laut dem Text?	1. Extraversion ist nicht veränderbar. 2. Extraversion ist veränderbar.				
Mindset of extraversion	Bitte benutzen Sie die folgende Skala, um anzugeben, wie stark Sie den einzelnen Aussagen zustimmen! Man hat ein bestimmte Ausprägung an Extraversion, und diese kann man nicht wirklich verändern. (R) Die eigene Extraversion ist etwas, das man selber nicht sonderlich verändern kann. (R) Egal, wer man ist, man kann immer die eigene Extraversion bedeutsam verändern. Um ehrlich zu sein glaube ich, dass man die eigene Extraversion nicht wirklich verändern kann. (R) Man kann die eigene Extraversion immer wesentlich beeinflussen. Man kann die eigene Extraversion deutlich verändern.	7-point Likert-Scale: 1 = *stimme überhaupt nicht zu* 2 3 4 5 6 7 = *stimme voll und ganz zu*	Dweck (1999)	3.99	1.38	.93
Satisfaction with extraversion	Wie zufrieden sind Sie mit dem Ergebnis Ihrer Ausprägung an Extraversion?	7-point Likert-Scale: 1 = *überhaupt nicht zufrieden* 2 3 4		5.21	1.55	

		5 6 7 = *voll und ganz zufrieden*		
Change goal of extraversion	Wie wahrscheinlich würden Sie teilnehmen?	7-point Likert-Scale: 1 = *sehr unwahrscheinlich* 2 3 4 5 6 7 = *sehr wahrscheinlich*	3.45	1.82
Gender	Bitte geben Sie an, mit welchem Geschlecht Sie sich selbst eher identifizieren.	Choice: weiblich, männlich, freie Angabe	69.7% female 1.4% other	
Age	Bitte geben Sie ihr Alter an.	18-99	28.09	7.08
Student	Studieren Sie?	Choice: Ja, Nein	64.1 % students	
	Falls Sie studieren, bitte geben Sie Ihr Studienfach an.	free text		
Seriousness Check	Ihrer ehrlichen Meinung nach, sollten wir Ihre Daten in unserer Auswertung berücksichtigen? (Ihre Antwort hat keinen Einfluss auf Ihre Chancen in der Verlosung)	Choice: Ja, Nein		

| Commentary | Haben Sie Anmerkungen zu dieser Studie? | free text |

Appendix D - Preregistration

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
H1: If a growth mindset of extraversion is induced, the change goal of extraversion in a social setting is higher than if a fixed mindset is induced.
H2: Introverts have a higher change goal of extraversion in a social setting than extraverts.
H3: Extraversion moderates the effect of mindset of extraversion induction on the change goal of extraversion in a social setting. The relative effect from fixed to growth mindset induction on the change goal of extraversion in a social setting is stronger for introverts than for extraverts.
Exploratory Question 1: How does the test taker's reaction relate to extraversion and the change goal of extraversion in a social setting?
Exploratory Question 2: How does age affect the change goal of extraversion in a social setting?

3) Describe the key dependent variable(s) specifying how they will be measured.
Change goal of extraversion in a social setting is measured using a 7-point Likert scale. All items used in the study were translated into german.
"Your current or future employer offers you the chance to participate in this group-training to increase your level of extraversion. Please read the following flyer!" (An flyer for the group-training is shown.) "How likely would you participate?" (1 = very unlikely; 7 = very likely)

4) How many and which conditions will participants be assigned to?
It is an online experimental study using a between-subjects design. Participants are randomly divided into two groups: fixed mindset induction or growth mindset induction
A short article about the advantages of extraversion at work (Wilmot et al. 2019) and the changeability/stability of extraversion (IV), including a quiz and a "saying is believing" task (Yeager et al., 2016), is given. Additionally, the manipulation is checked using modified items of Dweck (1999) measuring the extraversion mindset.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
To test hypothesis I, a t-test of independent samples is conducted. It is expected that, if a growth mindset of extraversion is induced, the mean change goal of extraversion in a social setting is higher than if a fixed mindset is induced.
To test hypothesis II, a regression analysis is conducted. It is expected that introverts have a higher change goal of extraversion in a social setting than extraverts.
For hypothesis III the moderation of extraversion on the effect from mindset of extraversion induction on the change goal of extraversion in a social setting is tested via PROCESS Model 1 (Hayes, 2017). It is expected, that the relative effect from fixed to growth mindset induction on the change goal of extraversion in a social setting is stronger for introverts than for extraverts.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Exclusion criteria: When processing the data, individuals who fulfill one or more exclusion criteria are excluded. These criteria include participants who did not accept the declaration of consent and who have not fully completed the questionnaire. An incorrect answer in a seriousness check question also leads to exclusion ("According to your honest opinion, should we consider your data in our evaluation?"). Participants are also excluded, if the analysis shows that they obviously did not answer conscientiously and if they fail to answer a quiz based on the manipulation texts.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
An a-priori sample size calculation using G*Power (t-test, difference between two independent means; d = 0.30, α = .05, 1-β = .80, allocation ratio = 1) resulted in an optimal sample size of N = 280 participants. Data collection will be stopped after 300 participants were recruited, or by March 6th, 2022.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
For exploratory questions I and II regression analyses are conducted, to test direct effects and PROCESS (Hayes, 2017) is used to test possible theorized models.For exploratory question I the test-taker's reaction on their real extraversion score (based on Costa and McCrae's [1992] NEO-PI-R Domains) is measured via one item: "How satisfied are you with the result on your degree of extraversion?" (1 = not happy at all; 7 = very happy)
For exploratory question II age is measured.

Appendix E – Ethics Checklist

		Yes	No
1.	Will the study involve persons who cannot consent to participate (for example, persons under the age of 18, persons who are not legally able to consent)?	☐	x☐
2.	Will the study involve persons belonging to a particularly vulnerable group (for example, clinical samples, people with learning disabilities, people in hospital or prison settings)?	☐	x☐
3.	Is it necessary for people to participate in the study without being informed about their participation at that time or without giving their consent (for example, in non-open observation)?	☐	x☐
4.	Is it necessary that people participating in the study are not fully informed about the purpose and content of the study? (Note: the full information does not mean the disclosure of the hypotheses, but refers to the purpose and course of the study. For example, incomplete or incorrect information is given when a cover story is needed to address the questions)	x☐	☐
5.	Is it necessary for people to be actively deceived about the content and purpose of the study?	☐	x☐
6.	Is it necessary to ask the subject questions that are of an intimate nature or are perceived to be stigmatizing (such as illegal or deviant behavior)?	☐	x☐
7.	Can the participants expect the study to result in psychological stress, fear, fatigue, pain or other negative effects that go beyond what is expected in everyday life?	☐	x☐
8.	Are medications, placebos or other substances given to participants in the study?	☐	x☐
9.	Are the participants in the study undergoing any invasive or potentially harmful procedures?	☐	x☐
10.	Are personal data that cannot be processed in an anonymous fashion collected (for example, video/audio recordings of participants)? If yes, which data: Are the subjects informed about this? ☐ **yes** ☐ **no** Can the subjects ask for this information at any time, before the deletion/destruction of the data? ☐ **yes** ☐ **no**	☐	x☐
11.	Is the participant paid a financial allowance that clearly exceeds an average of 15 euros per hour? If so, what is the amount? For what reason is it necessary to pay this amount per hour for participation?	☐	x☐