Developing Workplace Skills: A Multi-Sample, Longitudinal Study of Volitional Skill Change

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DEDICATION/EPIGRAPH

This dissertation is dedicated my parents, Ann and Andy. Your careers in psychology inspired me to purse a field where I hope to help others, and I could not have accomplished this without your love and support.

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ABSTRACT

Changing labor demands have incentivized new types of knowledge and skill development, and we currently lack an understanding of how people want to change their skills. The purpose of this study was to examine what people want to change about their knowledge, skills, and abilities and how different types of skills develop during the transition to work. I examined people's goals to change skills, how these goals related to perceptions of current skill levels, and whether there were differences by gender in a nationally representative cross-sectional dataset and a sample of recent college graduates. Results indicated that the most popular skill change goals were related to Social, Emotional, and Behavioral (SEB) skills, such as communication, and Knowledge and Technical skills, such as computer programming. SEB change goals were inversely related to perceptions of current skills, whereas Knowledge and Technical skill change goals were positively related. The largest gender differences in perceptions of knowledge and skills were in Technical skills, but there were not gender differences in skill change goals. In the college graduate sample, the rank order of perceptions of skills was moderately stable over four months during the transition to work, but most perceptions of SEB skills decreased during the transition to work. These results inform an understanding of what people want to change about their skills and suggest that the transition to work may be a time in which recent college graduates need additional opportunities to utilize and develop SEB skills.

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Developing Workplace Skills: A Multi-Sample, Longitudinal Study of Volitional Skill Change

When hiring new employees, recruiters and managers often look for candidates who possess specific knowledge, skills, and abilities. Evaluating these individual differences is done in an effort to find candidates who will fit well with the job and the organization. Research indicates that by 2025, 50% of workers will need to reskill (World Economic Forum, 2020). Research also indicates that for entry-level employees, a skills-based approach for hiring decisions predicts success on the job five times better than using degree requirements (World Economic Forum, 2020). In addition to better predicting success, skills-based hiring may also provide a way to open jobs to a more diverse pool of candidates. These findings and preliminary evidence that matching skills to one's job is associated with job satisfaction and performance underscore the importance of workplace knowledge and skills (Caldwell & Reilly, 1990; Leiponen, 2005). That said, we currently lack an understanding of people's goals to develop knowledge and skills, how these goals relate to their current knowledge and skills, and whether such goals differ by gender.

Examining people's goals to change their skills and knowledge is important for several reasons. On a macro level, changing labor demands suggest there may be a shortage of certain knowledge and skills in the near future. Thus, understanding the labor market's potential future knowledge and skills is needed to understand where interventions and training should be directed (World Economic Forum, 2021). On an individual basis, understanding an applicant's goals to change could be used to establish and predict person-job fit during recruitment and selection and for employee development. Categorizing and quantifying knowledge and skill change goals may be particularly useful for predicting long-term fit and for employee development and has not

been done at all. In addition, while there are well-established gender differences in vocational interests and certain occupations, differences in knowledge and skills and in goals to change these are less clear. These may be important for explaining, predicting, and reducing occupational and wage gaps in the future. This information may also be used to ensure all groups experience fit and, therefore, satisfaction and high performance across occupations. Lastly, it is also unclear which skills are most likely to develop during the transition to work among young adults. Skills that do not develop during the transition may need increased emphasis both in school interventions and organizational training and be more important to assess during the selection process.

In this two-sample dissertation, I examined skill change goals, gender differences in perceptions of skills, and how perceptions of skills developed during the transition to work. In Sample 1, I used a nationally representative sample of adults to examine people's knowledge and skill change goals to see what skills people want to develop, how they align with perceptions of current skills, and if skill change goals differ by gender. In Sample 2, I used a sample of recent college graduates followed longitudinally to examine rank-order stability and mean-level change in perceptions of Social, Emotional, and Behavioral Skills (SEB) skills during the transition to work. This informed an understanding of which skills change during the transition from college to full-time work and which skills may need enhanced interventions and training. I also looked at gender differences in perceptions of SEB skill development during this transition. Last, I also replicated my Sample 1: Prolific analyses in Sample 2: College Graduates to examine the prevalence of different skill change goals among recent college graduates.

This study makes several contributions. The first contribution involves understanding what goals people have for their knowledge, ability, and skill development. It is important to

understand people's skill change goals as people are motivated by goals, and these are likely to predict actual changes in skills (Locke & Latham, 2006). In the next five years, forty percent of workers' core skills are expected to change (World Economic Forum, 2021). This is an issue for companies and the economy, as well as for individual workers. A workforce without the necessary skills would be associated with large labor shortages and economic decline (Manyika et al., 2011; Burrus, 2013). For individuals without in-demand skills, unemployment is likely to be an issue (Manyika et al., 2011; Burrus, 2013). Additionally, aside from employees not being able to perform jobs, a lack of skills and knowledge fit may also be associated with worse job attitudes, as research indicates that person-job fit based on skills and knowledge is associated with career choice satisfaction (Thomas et al., 2021).

This study helped illuminate what skills people currently have goals to change and if these skills align with labor demands. For instance, in recent years, there have been ongoing issues revolving around having more lawyers than positions available and shortages in the nursing field (Harper, 2011; Murray, 2002). This may lead to an overabundance of people looking for jobs within the legal sector and shortages in hospitals, which hurts both individuals who struggle to find work and the economy as nurses are overworked and in short supply. In aggregate, to the extent that goals to change skills predict actual changes, the frequencies of skill change goals may best exemplify where the workforce is going and how to design large-scale educational and organizational interventions and training protocols in the population. Goals that are more common may be targeted in wide-scale organizational training, whereas goals that are less popular may make certain people more suited for specific roles or employee development initiatives. In general, a greater understanding of how to categorize knowledge and skill change

goals, and the prevalence of certain goals, can be used to develop interventions and training and to identify which employees may be best suited for certain roles.

We also lack an understanding of how people's knowledge and skill change goals relate to their current skills. Put another way, we don't know if people want to develop knowledge and skills at which they are already strong or if people tend to have goals to develop in weaker areas. Gaining a greater understanding of this may help to identify who should receive certain interventions and training and what skills for which they should be focused. For example, if most people reporting STEM skill change goals are already high in STEM skills, training and interventions for STEM should largely be directed at people who already excel in the area. However, if most people reporting STEM skill change goals are low in STEM skills, interventions and training should potentially target, or at least be open, to students and employees for whom STEM is not a strength. In this way, skills that are in high demand can be most efficiently cultivated, and individuals' skills can be developed in the ways they desire. Overall, a greater understanding of both knowledge and skill change goals and how they relate to current knowledge and skills can be utilized to predict gaps in the labor market, design interventions to increase certain knowledge and skills, and establish person-job fit in organizations.

Additionally, skills and knowledge, and goals to change them, have not been studied extensively as an explanation for gender gaps in college majors and occupations. My examination of perceptions of knowledge and skills provided information regarding gender differences in knowledge and skills and could have explained occupation differences better or in addition to other factors. Differences in skill change goals may also help to explain differences in occupations and predict where there may be large gender gaps in the future. This could be an

important and somewhat overlooked area for future research as certain goals may lead to more lucrative or satisfying careers and help reduce wage gaps, particularly in the face of changing labor market demands. This may be particularly important given that knowledge and skills can likely be intervened upon and trained more so than things like personality or values.

It is also important to better understand how social, emotional, and behavioral skills (SEB) develop during the transition to work. Social, emotional, and behavioral skills are people's "capacities to maintain social relationships, regulate emotions, and manage goal- and learning-directed behaviors" (Soto et al., 2021). While similar to personality traits, SEB skills differ from traits in that traits predict how people tend to behave, whereas SEB skills represent how people are capable of behaving (Soto et al., 2021). For instance, one may tend to be introverted but be capable of more extraverted behavior when their job demands it. Just as Big Five traits are important for job performance and more specific roles, such as leadership and team-oriented positions, these skills are likely also important for performance. They may also have the added benefit of being more "trainable" than actual personality traits. Understanding which skills are likely to change during the transition to work may help to predict person-job fit, which is tied both to employee performance and satisfaction. Organizations should likely place the most emphasis on skills that show the least amount of change during the transition to work. These skills may require additional training or intervention on the job or simply be less malleable and likely to change regardless of training. Skills that do not change may also require earlier intervention and increased attention in educational settings. Additionally, examining and identifying gender differences in SEB skill development during the transition to work may have illuminated challenges and advantages certain groups are likely to experience at work. For instance, if men experience greater increases in social engagement skills than women, they may

be more likely to be identified as leaders early on in their careers. This may increase their chances of promotion or provide them with additional opportunities to showcase leadership skills. Conversely, if this hypothetical were true, women may be pigeonholed into non-leadership tracks early on and face additional barriers to advancing their careers. Lastly, it was also unclear how skill change goals may influence or facilitate these changes. While it is clear that intentionally changing one's personality is challenging and effect sizes are small, changing skills related to personality has not been studied (Hudson & Fraley, 2015; Baranski et al., 2020). Understanding how goals influence changes in skills could be useful for academic institutions and organizations trying to improve skills through interventions, training, and development initiatives.

To summarize, this study has three key contributions. First, we examined people's knowledge and skill change goals and how these related to their perceptions of current knowledge and skills. In aggregate, these may be used to predict knowledge and skills shortages and surpluses related to changing labor demands and areas where the workforce will need reskilling. For individuals and organizations, a greater understanding of how to categorize skill change goals, and the prevalence of these goals in the population, may be used to predict knowledge and skills fit and training and development needs. Second, we also examined gender differences in self-reported skills and skill change goals. These differences may help explain wage and occupation gaps, be used for developing interventions to reduce gaps and enhance fit and help determine if certain genders' skills and goals are more aligned with the future of work. Third, we examined how perceptions of SEB skills change during the transition to work and the roles of gender and goals in impacting these changes. This may inform which SEB skills are most important during recruitment and selection and which can be trained and intervened upon

within organizations. This study could have also illuminated the role of goals in facilitating desired changes. Overall, how these skills develop may be important for predicting job attitudes, job experiences, and job performance.

Conceptual Background: Knowledge, Skills, and Abilities

Skills, abilities, and knowledge have been studied in Industrial-Organizational literature as well as a variety of other disciplines such as business, education, and economics. Generally, skills and abilities are more focused on what people can do, whereas knowledge is more about facts they know (Sackett et al., 2017). There is also a distinction between skills, sometimes colloquially referred to as soft versus hard skills. Hard skills are more technical, like computer programming or performing CPR, whereas soft skills are more people or behavior-oriented, such as being persuasive or empathic. Abilities tend to be more focused on cognitive abilities and physical abilities (Bastian et al., 2005; Ryan et al., 1996; Tach & Farkas, 2006). In any case, soft skills, hard skills, abilities, and knowledge are all areas with individual differences. Given this, just like other individual differences such as vocational interests and personality, they can be used to predict fit, attitudes, and performance in organizations. Overall, while there are a variety of conceptualizations, knowledge, skills, and abilities are clear ways to categorize individual differences and are explained further below.

Knowledge

Firstly, knowledge is referred to as "facts a person knows" or the level of expertise in the field (Blackler, 1995; Henderman & Tjakraatmadja, 2012; Sackett et al., 2017). Examples of knowledge in skill taxonomies include knowledge of "biology" and "food production" as well as "programming" and "medical." Knowledge is often considered important for job performance and is thus critical when organizations make selection decisions (Kamoche et al., 2011). This

may be particularly true for more complex jobs in which applicants need extensive knowledge in a given domain before entering a role. For instance, doctors cannot be trained to understand anatomy. This is the type of knowledge that a candidate needs prior to starting a job. Seeing as people have differences in their knowledge, knowledge may play a crucial role in predicting job performance as well as for predicting person-job fit.

Abilities

Abilities reflect what someone is capable of doing as opposed to what they know. However, compared to skills, abilities are more general and may influence the development of more specific skills and knowledge. Abilities can be separated into cognitive and physical abilities. When measured, cognitive ability includes a general aptitude for abstract thinking, problem-solving, and learning complex things (Gottfredson, 1997). Cognitive ability is often cited as a very strong predictor of job performance, explaining up to 25% of the variance (Schmidt & Hunter, 1998). This may be because cognitive ability makes learning easier and thus influences the development of many specific skills that may be needed in one's job. Cognitive ability can also be broken into narrower facets such as "problem-solving" and "reading." Physical Abilities are also included in skill taxonomies. Physical abilities include things like "strength" and "dexterity." The role of physical ability in predicting job performance may vary significantly depending on the nature of the job. For instance, firefighters need to be able to carry a large amount of weight, but this is not often needed in office settings. Similar to knowledge, abilities are important for predicting job performance.

Skills

As mentioned previously, skills are often colloquially categorized as hard vs. soft skills. Hard skills are more technical and include things like computer programming or investing. They

have substantial overlap with knowledge or "facts people know." Like knowledge, hard skills may be more easily learned or trained as long as someone has a baseline ability level. Furthermore, similar to knowledge, certain hard or technical skills are often critical to job performance. A surgeon needs to have extensive knowledge of biology as well as specific abilities such as fine motor skills to perform surgery. In essence, combining the knowledge and specific ability results in a more specific, technical "skill" that is critical to job performance.

There are also social, emotional, and behavioral skills. These are more akin to "soft skills" and are defined as "people's capacities to maintain social relationships, regulate emotions, and manage goal- and learning-directed behaviors" (Duckworth & Yeager, 2015; Lapinski, 2019; Soto et al., 2021). These skills make up the Behavioral, Emotional, and Social Skills inventory (BESSI) and are integrated into other skill taxonomies, such as the Occupational Skills and Knowledge Inventory (OSKI). These skills are "often the hardest to master" and "what makes humans indispensable" (Grant, 2021). As mentioned previously, these skills are related to personality traits but differ in that they are what people are capable of doing as opposed to what they tend to do (Soto et al., 2021). Soto and colleagues break SEB skills into five categories: Social Engagement, Cooperation, Self-Management, Emotional Resilience, and Innovation Skills (2021). These five categories map onto Big Five personality traits. Social engagement skills, or "capacities used to actively engage with other people," are similar to extroverted behaviors (Soto et al., 2021). Cooperation skills, which are defined as "capacities used to maintain positive social relationships," are similar to agreeable behaviors (Soto et al., 2021). Self-management skills, or "capacities used to effectively pursue goals and complete tasks," are similar to conscientious behaviors (Soto et al., 2021). Emotional resilience skills, which are "capacities used to regulate emotions and moods," are similar to emotional stability behaviors (Soto et al., 2021). And

innovation skills, or "capacities used to engage with novel ideas and experiences," are similar to openness behaviors (Soto et al., 2021). Big Five traits, which are similar to these skills, are associated with a variety of employee outcomes such as leadership emergence and effectiveness, organizational citizenship behaviors, task performance, job attitudes, and team performance (Barrick & Mount, 1991; Bell et al., 2007; Chiarabu et al., 2011; Schmidt, 1998 & Hunter; Judge et al., 2008; Judge & Bono, 2000). Given the similarities between Big Five traits and SEB skills, it is likely these skills are important for job performance.

Existing Skills and Knowledge Taxonomies

One of the issues in the skills domain is that there is not yet a skill "language." Personality is typically studied using the Big Five taxonomy. Likewise, vocational interests are usually studied using the RIASEC framework. This makes it easier to synthesize research and apply it in organizational settings. The language for skills is still being developed. Both the BESSI and the Skills Matcher were used to create the OSKI, which is the skills taxonomy used in this study.

The BESSI

The BESSI focuses exclusively on "people's capacities to maintain social relationships, regulate emotions, and manage goal- and learning-directed behaviors" (Duckworth & Yeager, 2015; Lapinski, 2019; Soto et al., 2021b). These social, emotional, and behavioral skills are more aligned with "soft skills." As mentioned previously, these skills are related to personality traits but differ in that they are what people can do as opposed to what they tend to do (Soto et al., 2021). This skills taxonomy would not be useful for establishing fit because it only includes social, emotional, and behavioral skills, and most jobs require specific abilities or job knowledge

in addition to "soft skills." This may also not be comprehensive for addressing and projecting labor demands.

Career One Stop's Skills Matcher

In contrast, the skills matcher includes forty skills that largely fall under knowledge and hard skills ("Skills Matcher," 2022). Examples of skills include "biology," "writing," and "memorization. Additionally, this conceptualization of skills ranks skills to suggest possible majors and career paths. The skills matcher does not include communication, nor does it include many social, emotional, and behavioral skills such as leadership and organization skills. These are all skills sought and valued by organizations currently as they are related to job performance. Further, many of these social, emotional, and behavioral skills are predicted to be important for the future of work as technical skills may be replaced with technology. The Skills Matcher is primarily intended for career exploration and guidance, but it doesn't have a publicly available technical report to support its reliability or validity.

The Occupational Skills and Knowledge Inventory (OSKI)

The BESSI and the Skills matcher both served as building blocks for a new taxonomy, the OSKI, which integrates social, emotional, and behavioral skills and knowledge (Thomas et al., 2022). The OSKI was developed in order to have comprehensive skills and knowledge measure that could be used to establish person-job fit. The OSKI used ONET as a framework for identifying skills and knowledge, and thus makes matching one's skills with suitable jobs easy using ONET. In total, the OSKI has 27 knowledge items and 27 skills items, expanding on the skills matcher by including SEB skills (Thomas et al., 2022). The OSKI demonstrates high criterion and discriminant validity as well as criterion-related validity with job attitudes and fit perceptions (Thomas et al., 2022).

Overall, this measure is more comprehensive in its coverage of occupationally-relevant variables than previous skills measures. The OSKI measure could be used for career exploration online, for developing educational and workplace interventions to enhance skills, and within the fit literature to explore the role of skills fit for predicting job attitudes and performance (Thomas et al., 2022). Given its comprehensiveness, this taxonomy may also be used to examine and project gaps in the labor market.

Skills Fit: Attraction-Selection-Attrition Theory and Empirical Evidence

As mentioned previously, fit concerns the match between a person and their environment and can be satisfied if one party fulfills the needs of the other party, they share attributes, or both (Kristof-Brown et al., 2005). The Attraction-Selection-Attrition (ASA) framework emphasizes the importance of fit for predicting employee outcomes. According to the theory, people with greater levels of fit are more likely to apply to an organization, more likely to be selected, and more likely to stay (Schneider, 1987). This is because they are likely to be more satisfied (Schneider, 1987). According to this framework, individual differences directly contribute to someone's experience of fit with an organization. This is because these qualities match the organization's climate and culture. Then, over time, they shape the culture and climate by enacting policies and procedures to reflect their traits and what is important to them (Schneider, 1987). Overall, this theory supports the idea that person-environment fit leads to satisfaction and commitment and is therefore important for organizational functioning (Schneider, 1987).

In addition to the ASA framework, there is ample evidence to suggest that person-environment fit is associated with a variety of organizational outcomes. Person-environment fit is often associated with job attitudes such as satisfaction and commitment (Hoff et al., 2020; Kristof-Brown et al., 2005). A couple of specific examples of fit and employee outcomes are

values fit and vocational interests fit. Values fit is associated with employee satisfaction and behavioral intentions (Tepeci & Bartlett, 2002). Vocational interests are associated with a wide variety of outcomes, such as career satisfaction, turnover, and job performance (Nye et al., 2017; Nye et al., 2019). Essentially people who experience fit are more committed, more likely to stay, work harder, and ultimately perform better.

Skills fit may be more relevant to person-job fit than person-organization fit. That said, the general idea that people are attracted to environments and more committed to their job when they "fit" is aligned with the ASA framework. Preliminary evidence suggests skills fit, which is a type of person-job fit, is associated with both job satisfaction and performance (Caldwell & Reilly, 1990; Leiponen, 2005). Skills can also be used instead of degree requirements to open opportunities to people of more diverse backgrounds. Given the theoretical and empirical evidence for the importance of fit, developing clear ways to establish skills fit and associated outcomes is warranted. Furthermore, categorizing and integrating goals to change skills within the skills literature may be used to predict future fit within a given occupation or role and could be used both for career counseling and by organizations for selection and employee development purposes. Lastly, understanding how skills develop during the translation to work may be particularly useful for organizations trying to determine which skills to emphasize in selection decisions and how to direct employee training and development initiatives.

Study Overview

The goal of the study was to examine people's goals to change their knowledge and skills, how these relate to their perceptions of their current knowledge and skills, and how self-reported knowledge and skills and change goals may differ by gender. This information may be used to

predict how people want to change in relation to the labor market, and it can also help inform educational and organizational interventions and training.

Changing Nature of Work, Employee Development, and Skill Change Goals

The knowledge and skill taxonomies in the literature largely focus on current knowledge and skills. However, people's goals to change their knowledge and skills may be used to predict and address future gaps in the labor market. This study introduced the measurement of knowledge and skill change goals. This may be particularly important because, as mentioned previously, the nature of work is changing and is expected to continue changing. Increased technology and automation, as well as more people working from home, may be contributing to this change (Cascio & Montealegre, 2016, World Economic Forum, 2020). Additionally, people are working longer and part-time with greater frequency than in past generations (Berne et al., 2019). The workforce composition is changing in other ways as well. There are more women in the workforce as well as more international, multicultural, and disabled people working than in the past. All of these changes mean that there will be an increased demand for certain skills and less need for others. Literacy, internet usage, self-directed learning, and an understanding of diversity, other cultures, and the global economy will all be important in the future (Wilson, 2009). It has also been suggested that problem-solving, fluid intelligence, teamwork, innovation, and communication skills are most important for the future of work (Burrus, 2013). Critical thinking and self-management skills such as resilience, stress tolerance, and flexibility have also been cited as increasingly important (World Economic Forum, 2020). As a result, there may be an increased need for certain types of interventions and training in educational settings and organizations to prepare the workforce for changes in knowledge and skills demanded.

Knowledge and skill change goals may also be used to draw inferences about individual career trajectories, what roles and organizations a person may fit with best, and what types of training and development opportunities to offer employees. Even for people whose current skills will still be in high demand in the future, they will likely still wish to develop new skills or perfect current ones to advance in their careers. Knowledge and skill change goals may be useful to organizations for predicting fit during selection. As mentioned, this is important as fit is associated with employee attitudes and performance. This may be particularly true when goals are less prevalent in the population. For example, if improving communication skills are a common goal, all employees may appreciate opportunities and training to enhance these skills. However, if other skill goals, such as public speaking goals, are less common, they may predict who is best suited for certain roles. In this way, understanding how to categorize knowledge and skill change goals and the popularity of certain goals may be used by organizations for employee development purposes and career guidance. Overall, a greater understanding of what knowledge and skills people hope to develop generally can be used by organizations to place individuals in appropriate positions.

To understand how interventions and training should be structured, both broadly in the population and for individuals, we need to develop a greater understanding of the population's knowledge and skill change goals. While current skills can be estimated based on supply and demand in the labor market, there is also value in determining goals as these may best predict the future direction of the labor force and be used by educational institutions and organizations when developing interventions and training.

The knowledge and skill change goals structure in this study used the OSKI as a general framework. The OSKI breaks skills into three broad categories. These are knowledge, abilities,

and social, emotional, and behavioral skills. Similarly, goals to change skills were divided into these same three categories. Knowledge is generally thought of as things people know, and the category included STEM, Business, Mechanical, and Foreign Language change goals. For example, goals to improve in "math" or "learn Spanish" were included in this category. Abilities are things people can do and included cognitive and physical abilities. Goals to improve cognitive abilities were "memory" and "problem-solving," whereas goals to change physical abilities included responses such as "typing" and "strength." Lastly, social, emotional, and behavioral skills are "people's capacities to maintain social relationships, regulate emotions, and manage goal- and learning-directed behaviors" (Duckworth & Yeager, 2015; Lapinski, 2019; Soto et al., 2021). This category included Social Engagement, Cooperation, Self-Management, Emotional Resilience, and Innovation Skills (Soto et al., 2021). Within each broad SEB category, there were several narrower categories. For example, goals to improve public speaking fell under "Social Engagement," whereas goals to be more confident fell under "Emotional Resilience." The full structure of skill change goals can be seen in Table 2.

RQ1. What skills do people want to change?

In addition to examining goals to change skills and knowledge generally, there may also be some value in looking at how these goals relate to one's perceptions of their current knowledge and skills. Put another way, it is largely unclear whether people want to develop knowledge and skills within domains they already excel in or if their goals tend to be related to knowledge and skills for which they are largely unknowledgeable or unskilled. In the personality literature, people tend to want to change in ways that are inversely related to their current traits (Baranski et al., 2017; Baranski et al., 2020). Some motivation theories, such as Bandura's social cognitive theory and expectancy-value theory, suggest that self-efficacy is a key part of

motivation (Vroom,1964; Wood & Bandura, 1989). These theories would suggest that people are more likely to set and pursue goals they believe they can achieve (Vroom,1964; Wood & Bandura, 1989). In alignment with these theories, it may be more likely that people's change goals align with the skills for which they are currently self-reporting as high. That said, from a practical perspective, it may be more advantageous to one's career to develop additional, unrelated skills that help them stand out or grow. For example, someone who works remotely as a computer coder may have more confidence in their ability to advance their programming skills and set these types of goals. However, they may actually gain more professionally by enhancing their communication skills and thus, set these types of change goals. In general, it was not clear how people's goals to change workplace knowledge and skills relate to their perceptions of their current knowledge and skills.

Examining these patterns may illuminate how interventions should be designed and targeted. For example, assuming there is a greater need for STEM skills, and people who are already reporting they are skilled in STEM are more likely to have STEM change goals, interventions and training regarding improving STEM should largely be aimed at people already somewhat high in self- reports of STEM skills. For people who do not have the perception they are skilled in STEM and thus less likely to have STEM-related change goals, interventions aimed at increasing STEM skills may be more effective if they focus on increasing STEM-related self-efficacy, motivation, and goals as opposed to STEM skills. Conversely, assuming it is more likely for people with STEM-related change goals to have perceptions they are low in STEM skills, interventions and training may target beginners and focus directly on gaining skills. Furthermore, because the relationships between knowledge and skill change goals and current perceptions of knowledge and skills are largely unclear, there may also be differences in these

relationships depending on the skill change goal. For example, it may be that people who have SEB goals are likely to perceive themselves as less skilled in the area than people with Physical skill goals. Overall, gaining a greater understanding of the relationships between skill change goals and perceptions of current skills can provide information regarding how to design and target interventions and training aimed at helping cultivate certain skills and certain groups (i.e., people low in a certain skill).

RQ2. How do skill change goals relate to perceptions of current skills?

Gender Differences in Skills

Aside from skills being relevant for predicting labor gaps and fit, there are currently gender gaps within certain occupations. In terms of the RIASEC, there are a few areas with large gender gaps. Men are significantly overrepresented in realistic careers such as mechanics and construction as well as STEM careers such as computer science and engineering. Men also tend to hold more positions of power and leadership than women in business. Lastly, men are also underrepresented in helping careers like teaching, nursing, and counseling. These gaps are an issue due to large wage gaps between men and women, in which men tend to pursue higher-paying occupations and thus earn more than women. They are also a challenge for organizations as there is thought to be value in having a diverse workforce, both for its impact on innovation and performance and for the impact diverse representation can have on organizational culture and organizational reputation (Nkomo & Hoobler, 2014).

Social Role Theory

One of the most popular theories for explaining gender differences in occupational choice is social role theory, which suggests that men and women are socialized differently (Eagly, 1987). These differences in expectations can be seen early in life, such as how children

are treated. Boys' aggressive or inappropriate behavior is ignored with the idea that "boys will be boys," and boys who cry may be reprimanded or told to "be a man." Either way, boys are socialized to be less emotional, whereas girls are taught to be less aggressive and more sensitive. Because of these differences in socialization, men and women may be rewarded for different behaviors and thus learn to behave differently. They may view themselves as good at different things or receive rewards or encouragement for pursuing different occupations.

They are also likely to have different perceptions about which occupations they are likely to experience fit. For example, women are expected to be more nurturing and thus may feel they fit better in helping occupations such as counseling or teachings (Eagly, 1987). Alternatively, men are taught to be more dominant and assertive, traits that align more with leadership roles and are more valued in STEM and business roles (Cheryan & Markus, 2020; Eagly, 1987). This division of labor both results from and reinforces gender stereotypes as people's ideas about who belongs and will be successful in certain occupations influences their own occupational choices. (Eagly, 1987; Ridgeway, 2001).

One example of how social role theory influences expectations in work settings is evaluations of warmth and competence. While women are generally considered warmer than men, women who demonstrate competence elicit lower warmth evaluations than men who do the same (Cuddy et al., 2011). This exemplifies that there are different expectations for men and women. Women are expected to be warmer in general, and their competency undermines these evaluations. This may be disadvantageous in work settings as women who are dominant and assertive, which are traits that help men get ahead, and are associated with leadership, are not viewed as likable.

While there is likely value-in-diversity, it can be difficult for people to enter fields in which they are the minority. Negative experiences increase in relation to how underrepresented the minority group is compared to the majority group (Kanter, 1977). People may feel they do not belong or are not included. Additionally, people can experience "tokenism." This is when people are treated as though they represent their group. It can lead to increased performance pressure as well as having personal qualities and achievements replaced with "token" female characteristics (King et al., 2009). This can lead to women experiencing higher stress and lower job satisfaction (King et al., 2009). Overall, this, and the value-in-diversity hypothesis, suggest that creating more gender balance in occupations is good for people's personal experiences as well as for business performance.

Gender Differences in Interests, Personality, and Values. Social role theory is supported empirically and can be seen through gender differences in individual differences such as personality, vocational interests, and values. Role theory would suggest these individual differences are due to gender differences in socialization.

As far as vocational interests, the RIASEC theory would propose that there are gaps within these occupations due to gender differences in vocational interests. Research in this domain supports that the largest differences are that women are more interested in helping others or social careers, and men are more interested in careers that have to do with things or fall under the "realistic" category (Einarsdóttir, & Rounds, 2020; Su et al., 2009). Additionally, women are more interested in artistic careers, and men are more interested in investigative and enterprising careers (Einarsdóttir & Rounds, 2020). This aligns with differences in occupations, with women being overrepresented in helping careers such as nursing and teaching and underrepresented in mechanical and STEM occupations. Even within STEM careers, there are more women in

healthcare roles in which they can help others, as opposed to computer science and engineering, which have the reputation of being less social (Diekman et al., 2015). These findings align with social role theory as women may have been socialized to be helpers, and men may have been socialized to be more agentic.

Another possible explanation, or contributing influence, for these differences in occupations comes from personality research. According to this literature, women may be more agreeable, conscientious, and extroverted, and less emotionally stable than men (Schmitt et al., 2008; Weisberg et al., 2011). These differences may play a role in differences in occupations and would align with women choosing more social roles. Furthermore, this also aligns with role theory, which would suggest women are taught to be more caring, nurturing, and emotional, whereas men are taught to be more assertive, strong, and independent.

Lastly, differences in work values could also explain occupation differences between men and women. Research shows that men tend to endorse less communal values and choose careers that are more individualistic (Boucher et al., 2017; Diekman et al., 2011; Wang & Degol, 2013). In contrast, women have more communal work values and thus choose careers in which they believe they can work with others and can help others (Boucher et al., 2017; Diekman et al., 2011; Wang & Degol, 2013). There is also evidence that women are more likely to endorse social values (Duffy & Sedlacek, 2007). Again, these findings align with role theory and suggest that women are more socialized to help, and men are socialized to assume more agentic roles.

Gender Differences in Perceptions of Skills and Skill Change Goals. While differences in personality, values, and especially vocational interests, have all been examined as possible explanations for occupational gaps, gender differences in knowledge and skills have not been researched as extensively. There is some preliminary evidence to suggest there are gender

differences in knowledge, abilities, and SEB skills. For knowledge, research shows differences favoring men in physical sciences, electronics and technology, geography, history, and physics (Ackerman et al., 2001). Research with regard to entrepreneurship knowledge shows that both genders lack knowledge, but women are more aware of their deficiencies (Kourilsky & Walstad, 1998). With regard to financial investment knowledge, men both self-report and actually know more than women (Goldsmith & Goldsmith, 1997). As far as differences in abilities, research indicates that women outperform men in verbal fluency, accuracy, perceptual speed, and fine motor skills. In contrast, men outperform women in working memory, spatial abilities, and math abilities (Sherwin, 2003; Upadhayay & Guragain, 2014; Zaidi, 2010). Lastly, there is evidence to suggest that women score higher on social and emotional skills (Groves, 2005).

While there is some research to suggest gender differences in skills, there is not substantial evidence. It could be that men and women have similar perceptions of knowledge and skills and related goals, and those with similar perceptions of skills and goals choose to pursue different career paths. For example, men and women may report being equally skilled in biology, but men may pursue more research-oriented careers, and women may pursue more healthcare roles. This would align with role theory, which would suggest that women and men are socialized to behave and perceive good fit with different occupations (Eagly, 1987). This would also align with research that suggests stereotypes influence girls to be less interested and perceive less of a sense of belonging in STEM careers (Master et al., 2021). Alternatively, it could be that men and women report different knowledge and skills and related goals, and this could help to explain why there are gaps within certain occupations. This would also align with role theory as men and women may learn through socialization that they are good at, or will be rewarded, for developing different skills (Eagly, 1987).

Examining these differences helped to determine if it is differences in perceptions of skills and goals that drive differences in occupations. This information may be used to develop skill interventions and training to reduce gender gaps in occupations. Should there be gender differences in perceptions of knowledge and skills, interventions may address developing knowledge and skills and increasing self-efficacy. However, should there not be differences in perceptions of knowledge and skills, interventions may instead address how knowledge and skills can be utilized in certain careers. For example, women may use biology skills to help others in medical careers. But there may also be opportunities to work in teams or help one's organization through a biology research career. For men, there may be a need for greater helping skills or for increased emphasis on how other skills are utilized in teaching, counseling, and other helping professions. Furthermore, while looking at differences in knowledge and skills based on occupation may provide an objective avenue for coding differences in skills, self-report may provide greater insight into how men and women view their own knowledge and skills, independent of occupation. Role theory would align both with women and men reporting different skill sets and with men and women with the same knowledge and skills pursuing different careers.

Overall, the basic idea would be that women may develop perceptions of knowledge and skills and have change goals that are more oriented towards helping others, and men develop perceptions of knowledge and skills that are more related to working with things (realistic and investigative RIASEC categories) and less communally oriented. Furthermore, even for men and women with similar perceptions of their knowledge and skills, role theory would suggest that women are more likely to pursue helping careers and men more realistic and investigative careers. However, while vocational interests and values, to a certain extent, have received more

attention in the literature, specific gender differences in perceptions of knowledge and skills are largely unclear and have never been examined using the OSKI framework. Thus, the research questions generally explored if and how knowledge and skills, and goals to change, differ by gender.

RQ3. How do perceptions of skills differ by gender?

RQ4. How do skill change goals differ by gender?

Social, Emotional, and Behavioral Skills Change During the Transition to Work

While cognitive ability is a strong predictor of job performance, personality also explains significant incremental variance (Schmidt & Hunter, 1998). Social, emotional, and behavioral skills, which are similar to personality, also influence success in life and work (Soto et al., 2021). SEB skills differ from personality in that they are what people are capable of doing as opposed to what people tend to do. This may make them particularly relevant to job performance seeing as job demands may require employees to deviate from their natural tendencies in order to elicit high performance. For example, someone who is introverted may tend to be quiet in social settings. However, they may lead meetings in their management position at work and thus have social skills that allow them to succeed at work. Additionally, 94% of business leaders report expecting employees to pick up new skills on-the-job (World Economic Forum, 2020). In 2018, it was only 65% (World Economic Forum, 2020). Given this, a greater understanding of how these skills develop during the transition may be increasingly important and be used for employee selection and development.

As mentioned previously, social, emotional, and behavioral skills can be broken into five categories: Social Engagement, Cooperation, Innovation, Emotional Resilience, and Self-Management. *Social engagement skills*, or “capacities used to actively engage with other

people," are similar to extroverted behaviors (Soto et al., 2021). Extraversion is predictive of leadership emergence and effectiveness as well as success in other interpersonal roles (Barrick & Mount, 1991; Judge et al., 2008). *Cooperation skills*, which are defined as "capacities used to maintain positive social relationships," are similar to agreeable behaviors (Soto et al., 2021). Given their overlap with agreeableness, these skills may be especially useful for predicting transformational leadership, prosocial, or interpersonal, organizational citizenship behaviors (OCB-I), and team effectiveness (Bell et al., 2007; Chiarabu et al., 2011; Judge & Bono, 2000). *Self-management skills*, or "capacities used to effectively pursue goals and complete tasks," are similar to conscientious behaviors (Soto et al., 2021). Conscientiousness is the best personality predictor of job performance and has incremental validity above cognitive ability (Barrick & Mount, 1991; Hunter & Schmidt, 1998). It is also associated with leadership, training performance, and proactive, or organization-directed, organizational citizenship behaviors (OCB-O) (Chiarabu et al., 2011; Judge et al., 2008). *Emotional resilience skills*, which are "capacities used to regulate emotions and moods," are similar to emotional stability behaviors (Soto et al., 2021). Emotional stability is related to team effectiveness and job attitudes (Bell et al., 2007). And *innovation skills*, or "capacities used to engage with novel ideas and experiences," are similar to openness behaviors (Soto et al., 2021). Openness, and related behaviors, may be useful in predicting training performance or in environments where creativity is needed or ambiguity must be tolerated. The BESSI, which is a SEB skill taxonomy that breaks SEB skills into these five main categories, also includes a few compound skills, such as adaptability (Soto et al., 2021).

In the context of personality change interventions with experimenter contact, volitional personality change goals have small effect sizes on actual personality changes (Hudson & Fraley,

2015; Baranski et al., 2020). However, there is also the maturity principle, which shows that, in general, people become more agreeable, conscientious, extraverted, and emotionally stable as they age (Roberts et al., 2006). These changes are hypothesized to be in reaction to life circumstances and demands, and unlike volitional personality change studies, they are necessarily caused by personality change goals or formal behavioral interventions (Roberts et al., 2006). For example, people may become more conscientious as they experience more responsibility at work and in their personal lives caring for children. Given that Big Five traits change both in response to goals and active efforts to change and more naturally in response to life circumstances, it is likely that SEB skills change in some ways as well. However, these skills, and changes, are less understood.

Starting a full-time job after graduating from college is a major life transition, and as such, it may facilitate changes in social, emotional, and behavioral skills, just as life influences facilitate changes in personality as per the maturity principle. For instance, work demands may force recent graduates to better manage their time than was needed as students as they no longer have the flexibility to work at night. This may happen regardless of the person's previous goals to become better at managing their time. If and how perceptions of skills change during this transition is not clear. A greater understanding of this would be helpful for designing academic interventions and organizational training as well as for determining and predicting person-job fit during recruitment and selection processes.

RQ5. How do perceptions of SEB skills develop during the transition to work?

These changes will be examined in two ways. Firstly, rank-order stability indicates how individuals are relative to other people in a group. For example, if someone lacks communication skills relative to others in the group, and over time, they become better at communication than

others in the group, their rank order has changed. If Anna was better than Bill at communication at Time 1, but Bill was better at Time 2, the rank order of skills has changed. Rank-order changes show the consistency in skills relative to others across time. Research on the rank-order stability of personality traits indicates that stability increases with age (Roberts & DelVechhio, 2000). Using 1 year time periods, stability coefficients have been found to range from .31 in childhood, to .54 in college, to .64 at 30 years old, and then plateau at .74 between 50 and 70 years old (Roberts & DelVechhio, 2000). If perceptions of SEB skills follow this pattern, this indicates they will likely still experience some rank-order changes during the transition to work.

RQ5a. What is the rank-order stability of perceptions of SEB skills during the transition from college to work?

Alternatively, if everyone in the group becomes better at communication, there has been a mean-level change in communication. Mean-level changes indicate that, on average, a group has changed in a similar way. For example, if Anna was better than Bill at communication skills at Time 1, she would still be better at Time 2 because both of their communication skills improved. The personality change literature indicates that mean-level changes, such as those seen in the maturity principle, occur over time. There may be similar patterns with perceptions of SEB skills.

RQ5b. Are there mean-level changes in perceptions of SEB skills during the transition from college to work?

While there is literature to suggest that gender differences in vocational interests tend to decrease over time, the trends for workplace knowledge and skills are less studied (Hoff et al., 2018). Changes in SEB skills may be largely shaped by one's work. Assuming many workplaces necessitate the same SEB skills, it would make sense that gender differences in perceptions of

SEB skills tend to decrease with time as people of both genders are expected to demonstrate the same skills to perform. This would also be consistent with the cross-over hypothesis, which suggests that men's and women's personality traits, which are closely related to SEB skills, "cross-over" or differences decrease as a result of transitions in their social roles (Guttman, 1987). This theory suggests that men become more focused on family and thus more nurturing and sensitive as they age. (Guttman, 1987; Roberts & Helson, 1997). Conversely, as children grow and require less attention, women may become more dominant (Guttman, 1987; Roberts & Helson, 1997).

However, role theory and previous empirical evidence would also suggest that there are different expectations for men's and women's behavior and workplace roles. In this way, men and women may have different experiences, being treated and rewarded for different behaviors. Social role theory would align with men being socialized to demonstrate more social engagement skills in a work environment, whereas women may be expected to be more cooperative. There is also empirical evidence to support this perspective, with there being greater expectations of women to be warm at work (Cuddy et al., 2011). Furthermore, women who are competent are also perceived as less warm, a pattern that is not present for men (Cuddy et al., 2011). In this way, differences in perceptions of SEB skills may actually increase over time as women and men face different performance pressures when working.

RQ5c. Are there gender differences in mean-level change in perceptions of SEB skills?

While skill changes may happen during the transition to work regardless of if people previously set related goals, goal theory would suggest that goals may increase changes in skills (Locke & Latham, 2006). This would align more with volitional personality change research,

which attempts to assist people in changing their personality in desired ways, as opposed to the maturity principle in which these changes are thought to be more passive.

Theoretically, goal setting theory would suggest that goals to change one's skills should increase the magnitude of the changes due to their effects on motivation, which is the direction, intensity, and persistence in behavior. According to goal setting theory, accomplishing goals at work leads to satisfaction and higher performance, which leads to other more tangible rewards such as rewards and promotions (Latham & Locke, 2007). Goal-setting theory has also been well-supported empirically, with numerous studies showing that goals are positively related to changes in behavior (Chidester & Grigsby, 1984). Within the volitional personality change literature specifically, goals are also associated with personality change during interventions when interventions involve the experimenter reminding participants of their goals (Baranski et al., 2020; Hudson & Fraley, 2015, 2016). Thus, it follows that there is likely a positive relationship between SEB goals and perceptions of SEB skill development. However, without active reminders, this relationship may be less salient.

Hypothesis 1. Having a SEB skill goal will be positively related to perceptions of changes in that skill.

Method

Participants and Procedures

This study used two samples. The participants in Sample 1 were drawn from an online site, Prolific. This sample was representative of the U.S. population in terms of ethnicity, age, and gender. There were 768 participants. The sample had 383 females (49.1%), and the average age was 45.8 (SD=16.1). The ethnicity breakdown of the sample was: 71.5% white, 12.5% Black/African, 7.4% Asian, 4.9% Other, 3.4% Latino/Hispanic, and .3% Native American/First

Nation. Table 1 shows additional demographic information. All participants were compensated fifteen dollars per hour through the Prolific website. Surveys involved answering questions about their personality, values, vocational interests, and skills.

The participants for Sample 2 were recent college graduates who were currently transitioning to work. They had recently graduated college with a bachelor's degree from one of three large research universities in the South, Midwest, and West Coast. There were 817 participants. The average age of the participants was 22.78 (SD =2.97). There were 572 female participants and 225 male participants. The ethnicity breakdown of the sample was: 34.2% white, 12.5% Black/African, 34.6% Asian/Pacific Islander, 4.0% Other, 22.5% Latino/Hispanic, and .1% Native American/First Nation. Table 2 contains additional demographic information. Participants were contacted through email at four time points and asked to take a survey. They were offered a ten-dollar Amazon gift card as compensation for their participation at each time point.

Measures

Perceptions of Current Skills

To measure perceptions of current skills, participants completed the Occupational Skills and Knowledge Inventory (Thomas et al., 2022). Table 1A in the Appendix shows the items in the OSKI. The OSKI is a 54-item measure of skills. Participants were instructed to "Think and respond honestly about your level of knowledge and skill relative to other people. How skilled are you at /How much do you know about:" Participants responded to each of the items using a 5-point Likert-type scale, ranging from 1 = Beginner, 2 = Basic, 3 = Skilled, 4 = Advanced, 5 = Expert. Most perceptions of skills were assessed with a single item. For example, the item "Programming" was used to measure a single skill.

However, there is an underlying factor structure in which multiple items were used to measure perceptions of SEB skills. Table 2A in the Appendix shows the items in the SEB scales. For example, items **"**Stress Tolerance" and "Emotion Regulation" were combined to form the SEB skill "Emotional Resilience." SEB skills include Social Engagement, Cooperation, Self-Management, Innovation, and Emotional Resilience items. Alphas are listed for Sample 1: Prolific and Sample 2: College Graduates at Time 1. Table 5A in the Appendix shows alphas at all three timepoints for Sample 2: College Graduates.

Social Engagement (Sample 1 α =.83, Sample 2 α =.79). There are 4 Social Engagement items in the OSKI. They are "Speaking," "Persuasion," "Instructing," and "Managing Others."

Cooperation (Sample 1 α =.84, Sample 2 α =.90). There are 3 Cooperation items in the OSKI. They are "Social Perceptiveness," "Social Coordination," and "Helping People." Factor loadings ranged from

Self-Management (Sample 1 α =.80, Sample 2 α =.72). There are 4 Self-management items in the OSKI. They are "Attention to Detail," "Time Management," "Dependability," and "Persistence."

Innovation (Sample 1 α =.69, Sample 2 α =.94). There are 3 Innovation items in the OSKI. They are "Fine Arts," "Design," and "Creative Thinking."

Emotional Resilience (Sample 1 α =.77, Sample 2 α =.95). There are 2 Emotional Resilience items in the OSKI. They are **"**Stress Tolerance" and "Emotion Regulation."

I also created five Knowledge and Technical Skill Scales for non-SEB skills using a combination of EFA results and qualitative analysis. Table 3A in the Appendix shows the scales (STEM, Social Science, Computers, Mechanical, and Business) and the items in each scale.

These were only used for Research Question 2, which examined how skill change goals relate to current skills.

I also used Education/ College Major as an objective measure of Current Skills. In Sample 1: Prolific, participants were asked, "Please list your highest degree and major." In Sample 2: College Graduates were asked, "What is your major (Type NA if you are not currently in school)." Education/College Majors were categorized into ten broad categories: Business, Computers, Mechanical, Social Science, Health, STEM, Education, Communication, Visual Arts, and High School.

Volitional Skill Change Goals

To assess volitional skill change goals, participants were asked an open-ended question, "What skill do you most wish to develop or improve for your future career? Please be specific. Type NA if you do not wish to change any skill."

Table 3 shows the full table of Skill Change Goal Categories. Coding Manuals can be seen in the Appendix. Inter-rater reliability was 86% for Sample 1: Prolific and 92% for Sample 2: College Graduates.

Coding of Volitional Skill Change Goals. First, skill change goal responses were coded. To begin, the first 200 responses were examined, and categories were discussed based on themes in the responses and the knowledge, skill, and ability categories from ONET. Using this process, responses were put into eight broad categories: STEM, Physical, Social/Communication, General Cognitive, Artistic, Self-Management, Business, and Mechanical. Each response was coded by three undergraduate coders. Inter-rater reliability was 86%. Discrepancies were discussed by the dissertation author and research advisor to come to a conclusion. After this, responses in each broad category were evaluated, and narrower, facet-level categories were created. For example,

within Business, narrower categories were Human Resources, Finance, Accounting, Marketing, Law/Politics, and General Business (for responses that didn't fit into a narrower category). Each response was coded into a smaller, facet-level category by two coders, and discrepancies were resolved by a third person (the dissertation author). Coding Manuals can be seen in the Appendix. After all coding was completed, a revised hierarchy of skill change goals was created.

Table 3 shows the full structure of Skill Change Goals. This included three broad categories of skill change goals. Knowledge and Technical Skills, Abilities, and SEB Skills were the broad knowledge and skill categories. Within these broad categories, there were 11 second-level categories. Within most of these categories, there were additional narrower categories. For example, goals to improve "communication" will fall directly under "Social Engagement," which falls under the broader category of "Social, Emotional and Behavioral Skills." This is consistent with the BESSI, OSKI, and ONET.

Structure of the Occupational Skills and Knowledge Inventory

In Sample 1: Prolific, I tested the structure of Knowledge and Technical Skills and SEB skills using two EFAs. These were tested separately because they have different theoretical models and were expected to load into different structures. Both EFAs used a maximum likelihood extraction method with an oblique rotation. Generally, an oblique solution will fit sample data better (Henson & Roberts, 2006). Table 4 displays the results of an EFA for SEB Skills. The results of my EFA for SEB skills indicated a five-factor structure, with Social Engagement, Cooperation, Self-Management, Resilience, and Innovation items each forming a separate factor. This was consistent with my analysis plan and supported by parallel analysis. The factor loadings ranged from .42 to .98. Table 5 shows the results of my Knowledge and Technical Skills EFA, which indicated a seven-factor structure. The seven factors reflected Hard

Science, Business, Mechanical, Technology, Social Science, Communication, and Physical scales. Factor loadings ranged from .34 to .87. This structure was also supported by parallel analysis.

For Sample 2: College Graduates, I confirmed the factor structure for five SEB skills identified in Sample 1 using a CFA. Table 6 shows these results. It had good fit (CFI=.91, TLI=.89, RMSEA=.07, SRMR=.05, $X^2(94) = [505.012]$, p = .00). Factor loadings for the five constructs ranged from .56 to .82. For the Knowledge and Technical Skills subscales, I used the results of my Sample 1: Prolific EFA and a qualitative approach to form five Current Knowledge and Technical Skill Scales. Table 3A in the Appendix shows the items in these scales (STEM, Social Science, Computers, Mechanical, and Business).

Convergent and Discriminant Validity

Given the overlap between personality traits and SEB skills, I also analyzed the relationships between Big 5 traits and the five SEB skills in both samples to ensure construct validity. These results indicated that while personality traits are related to SEB skills, they are separate constructs. Table 7 shows these results for Sample 1: Prolific. The highest correlation between a personality trait and corresponding skill was between Conscientiousness and Self-Management skills (r = .61). The four remaining Big Five traits and corresponding SEB skill correlations ranged from .34 to .58, with an overall average correlation of .51. Table 8 shows the results of the correlation matrix for Sample 2: College Graduates. All correlations between Big 5 Traits and SEB skills were below .54, with the average across Big Five traits and corresponding SEB skills being .46. I also calculated alpha for all SEB scales and Big Five trait scales in both samples to ensure reliability. Alphas ranged from .69 to .84.

Analysis Techniques

I examined Research Questions 1-4 using frequencies, point biserial correlations, Cohen's *d*, and chi-squares in SPSS. I used frequencies to count skill change goals (RQ 1) and point biserial correlations to examine the relationship between skill change goals and current skills (RQ 2). I used Cohen's *d* to examine gender differences in current skills (RQ 3). I also used chi-square tests to examine skill change goal differences by major (RQ 2) and to examine gender differences in skill change goals (RQ 4). I used both samples for these analyses.

For my longitudinal analyses, I only used Sample 2: College Graduates. Before my longitudinal analyses, I conducted attrition analyses. I compared people who only answered at Time 1 with people who answered at Time 1 plus another time point to see if there were differences in SEB skills and gender between these two groups. The results indicated there were no significant differences in SEB skills or by gender between people who answered only at Time 1 versus Time 1 and other times. For each of my longitudinal models, I used Full Information maximum likelihood (FIML) technique in Mplus Version 8 (Muthén & Muthén, 2017). This technique is recommended in cases where there this missing data in a longitudinal model. FIML provides parameter estimates that are efficient and less biased than comparable methods in which data is missing at random.

Results

RQ 1: What Skills do People Want to Change?

First, I tested Research Question 1, "What skills do people want to change?" I did this by calculating the number of responses per skill change goal category and the percentage of each category relative to the overall sample. Table 9 summarizes these results, and Figures 1A-7A in the Appendix display these results graphically. Overall, the most commonly cited skill change goals were Knowledge and Technical Skills and Social, Emotional, and Behavioral Skill change

goals. In Sample 1: Prolific, 44% of people cited SEB goals, and 46% of people cited Knowledge and Technical skill change goals. Similarly, in Sample 2: College Graduates, 48% of people cited SEB goals, and 50% cited Knowledge and Technical skill change goals. Within Knowledge and Technical Skills, STEM was most commonly cited, with 30% of Sample 1:Prolific and 36% of Sample 2: College Graduates citing STEM change goals. Examples of STEM goals were programming, math, and medical goals. And within Social, Emotional, and Behavioral skills, goals to develop Social Engagement skills were most popular, with roughly 20% of people in each sample citing these goals. Examples of Social Engagement skills included communication and persuasion. The least popular skill change goals were goals related to cognitive and physical abilities. Cognitive goals included goals related to memory and reading, and physical goals included strength and dexterity. In Sample 1: Prolific, approximately 9% of people cited ability-related goals. In Sample 2: College graduates, that number was even smaller, with only about 2% of the sample citing ability-related goals.

RQ 2: How do Skill Change Goals Relate to Perceptions of Current Skills?

To test Research Question 2, regarding how skill change goals relate to perceptions of current skills, I used a point-biserial correlation between skill change goals and the matching perceptions of current skills. This demonstrated the strength and direction of the relationship between change goals and perceptions of current skills in that domain. Table 10 shows the results of this analysis. The results suggested that SEB Skill Change Goals are inversely related to perceptions of SEB skills, whereas Knowledge and Technical Skill Change Goals are positively related to perceptions of current Knowledge and Technical Skills. Skill Change Goals were broken into nine categories: Social Engagement, Cooperation, Self-Management, Innovation, Resilience, Business, Computers, Mechanical, and Science. Table 3A shows the items for the 10

Perceptions of Current Skill Scales, which were based on items in the OSKI. They were: Social Engagement, Cooperation, Self-Management, Innovation, Resilience, Business, Computers, Mechanical, STEM, and Social Science. Overall, there were several significant relationships between skill change goals and perceptions of current skills. SEB skill change goals were inversely related to perceptions of current SEB skills in both samples. In Sample 1: Prolific, goals to change Social Engagement, Cooperation, and Resilience were all negatively related to those perceptions of current skills. Similarly, in Sample 2: College Graduates, Social Engagement, Self-Management, and Resilience goals were negatively related to those perceptions of current skills. In contrast, Knowledge and Technical Skill Change Goals were positively related to perceptions of current Knowledge and Technical Skills in both samples. In Sample 1: Prolific, goals to develop computer and mechanical goals were positively related to self-reports of those current skills. Similarly, in Sample 2: College Graduates, computer skill change goals were positively related to perceptions of current Computer Skills.

I also used college major as a more objective measure of current skills and ran chi-square tests to determine if there were significant differences in skill change goals based on college major. In general, while there were few significant results, people's goals to develop skills sometimes aligned with their majors. For example, business majors in both samples were significantly less likely to cite science goals. This makes sense as science-related goals are likely not related to most jobs or careers in business. Additionally, in Sample 1: Prolific, visual arts majors were more likely to cite Innovation goals. This aligns with art majors needing to be creative. And in Sample 2: College Graduates, business majors were more likely to cite computer skill change goals. This makes sense as many business roles may require statistical analyses or creating visualizations of data. Some of the other findings made less sense, such as social science

majors citing mechanical goals in Sample 2: College Graduates or education majors citing science goals in Sample 1: Prolific. Overall, these results aligned with people striving to develop technical skills that aligned with their major.

RQs 3 and 4: How do Perceptions of Skills and Skill Change Goals Differ by Gender?

Lastly, I tested Research Questions 3 and 4 (concerning gender differences in change goals and perceptions of current skills). To test Research Question 3, I examined gender differences in perceptions of current skills, with separate means for male and female participants calculated for all 54 perceptions of current Knowledge and Technical skills and for all five perceptions of SEB skills. I calculated Cohen's *d*, a measure of standardized mean differences between groups. Table 11 shows the results for gender differences in perceptions of Knowledge and Technical Skills. In general, the largest gender differences in both samples tended to be in these perceptions of "hard" or technical knowledge and skills, with men self-reporting greater knowledge and skills. In Sample 1: Prolific, some of the largest gender differences can be seen in perceptions of "hard" skills, such as computers and electronics (d =.80), and natural science knowledge, such as physics (d = .74). In Sample 2: College Graduates, the largest gender differences in self-reported skills were in Computers and Electronics (d =.88) and Troubleshooting (d =.86).

As far as gender differences in perceptions of SEB Skills, men self-reported greater Resilience and fewer Cooperation skills in both samples. Table 12 shows these results. This aligned with gender stereotypes and expectations. Findings regarding other perceptions of SEB skills were less consistent. In Sample 1: Prolific, men reported greater Innovation skills. And in Sample 2: College Graduates, men reported fewer Self-Management skills.

To examine gender differences in skill change goals, chi-square tests and Fisher's Exact tests were used to compare frequencies. Table 13 shows all the results of these analyses. The results of these analyses indicated that there were no significant gender differences in skill change goals for either sample.

RQ 5: How do Perceptions of Social, Emotional, and Behavioral Skills Develop During the Transition to Work?

Rank-Order Stability

All of my longitudinal analyses used Sample 2: College Graduates. To test Research Question 5, "How do perceptions of SEB skills develop during the transition to work?" I examined patterns of rank-order stability and mean-level perceptions of SEB skill development. I analyzed rank-order stability using correlations between perceptions of SEB skills at three time points. Table 14 shows these results. The results of these analyses indicated that all perceptions of skills were relatively stable across the four-month transition period. From Time 1 to 2, there was an average correlation of .69 across perceptions of SEB skills. From Time 2 to 3, there was an average correlation of .66 across perceptions of SEB skills. And from Time 1 to Time 3, there was an average correlation of .62. Additionally, there was not a lot of variability across perceptions of skills over time, as the highest correlation was .75 between Innovation at Time 1 and Time 2, and the lowest correlation was between Resilience at Time 1 and Time 3 (r =.57).

Mean-Level Changes

I analyzed mean-level changes in perceptions of SEB skills in two ways. First, I compared mean scale scores at adjacent time points using standardized mean difference scores, Cohen's *d*. Table 15 shows these results. Overall, Social Engagement, Cooperation, and Self-Management all had small decreases between Times 1 and 3 (d = - .24, d = - .25), whereas the

results for Innovation and Resilience were not significant. There were larger differences between Time 1 and 2 for Social Engagement, Innovation, and Resilience. Cooperation and Self-Management showed similar effect sizes between Time 1 and 2 and Times 2 and 3.

Second, I also described mean-level changes in perceptions of SEB skills using linear growth-curve models. Perceptions of SEB skills were modeled as a function of time from Time 1 to Time 3. Table 16 shows these results, and Figure 1 shows the path model. All of the statistically significant slopes, which included Social Engagement (*M* = -.04), Cooperation (*M* = -.05), Self-Management (*M* = -.05), and Resilience (*M* = -.03) skills, were negative, indicating that SEB skills decreased during the transition to work.

Gender Differences

To test Research Question 5c regarding gender differences in the development of perceptions of SEB skills, I added gender as a moderator in the regression. Figure 2 shows the path model, and Table 17 shows the results. Results of these analyses indicated significant gender differences in initial levels of Cooperation (β= -.13), Self-Management (β= -.11), and Resilience (β = .16), with positive coefficients indicating that men had higher scores. However, there were no significant gender differences in rates of change during the transition to work.

Impact of Goals on Changes in Perceptions of Social, Emotional, and Behavioral Skills

Lastly, to test Hypothesis 1 regarding the role of skill change goals in facilitating perceptions of skill development, I added SEB change goals as a moderator in the regression. Goals for each SEB skill were dummy-coded (YES = 1, NO = 0) based on a match between a skill change goal and the perception of the SEB skill being evaluated. Figure 3 shows the path models, and Table 18 shows the results. There were significant differences in intercept values, indicating that skill levels at Time 1 differed for people who had a change goal versus those who

did not. People who had the goal tended to be lower in the given skill. These were found for Social Engagement (β = -.23), Self- Management (β = -.12), and Resilience (β = -.19). However, rates of change did not differ significantly based on whether or not someone cited a skill change goal for the given skill.

Discussion

These studies examined several topics relevant to the future of work, including what skills people want to develop, how those relate to perceptions of current skills, and how skills and goals differ by gender. This study also included analyses regarding how perceptions of SEB skills develop during the transition from college to work. Overall, the results indicated that goals to develop SEB skills and Knowledge and Technical skills are most common. People tended to report SEB skill change goals that were inversely related to their perceptions of current SEB skills. In contrast, people tended to report Knowledge and Technical skill change goals that aligned with their current perceptions of Knowledge and Technical skills. Men tended to report higher Knowledge and Technical skills than women. However, there were no gender differences in skill change goals. As far as skill development during the transition to work, perceptions of SEB skills tended to decrease during the 4-month period. Rates of change did not differ by gender or depending on skill change goals. However, initial levels of perceptions of SEB skills were significantly different based on gender and skill change goals. Overall, results suggested that people's goals to change skills align with labor market demands and that SEB skills may need enhanced attention during the transition to work. Each of these findings is discussed in more detail in the following paragraphs.

Skill Change Goals Align with the Future of Work

In general, goals to change knowledge and skills in both samples aligned with the future of work (Burrus, 2013; World Economic Forum, 2020; Wilson, 2009). Currently, projections indicate that hard knowledge and skills related to advancing and operating technology and soft skills related to working with others and independently will all be needed (World Economic Forum, 2020). People's goals to improve Knowledge and Technical skills, such as programming, and SEB skills, such as communication, are aligned with these demands. Changes in the workforce itself, the ways in which people work, and advancements in technology may all shape a world in which people need to be able to utilize technology but also develop skills that cannot be replaced by technology.

As technology use and virtual work continue to increase, technical skills, such as programming, will be increasingly important. Technology use, monitoring, control, design, and programming are among the World Economic Forum's Top 10 cited skills for 2025, underscoring the importance of people having the skills to operate and advance technology (World Economic Forum, 2020). Roughly 30% of each sample cited STEM change goals, which align with these demands.

That said, the worldwide labor market is shifting towards a demand for soft skills (Demming, 2017). In relation to technology advancements, SEB skills, such as Innovation, which includes skills such as creative thinking and design, may also help to develop new technologies and advance existing technology, even though they aren't classified as Knowledge or Technical skills. People also need to continue to develop SEB and Knowledge and Technical skills that cannot be replaced by technology. These can be people-oriented skills such as social engagement and cooperation that technology simply cannot replace. For example, when faced with a flight delay or cancellation, many people choose to wait in line at the airport or call

customer service to speak with someone, even when workers suggest they “use the app” to resolve the issue. This is just one example of how humans and SEB skills will be needed in the future.

Other changes in the workforce and ways people work may also necessitate enhanced SEB skills. As the workforce continues to become more diverse, it is important to have the social, or SEB, skills to collaborate with people from different backgrounds and with different viewpoints. Both Social Engagement and Cooperation skill change goals were cited frequently in both samples. This aligns with research that suggests an understanding of diversity, teamwork, and communication will all be needed in the future (Burrus, 2013; World Economic Forum, 2020; Wilson, 2009). Additionally, people working remotely may need enhanced self-management and self-directed learning to stay on-task and accomplish their goals. They may also need enhanced communication skills and relationship-building skills to remain connected to other employees, all of which align with projected skill demands (Burrus, 2013; World Economic Forum, 2020; Wilson, 2009).

These findings regarding skill change goals can be used to enhance interventions, education, and on-the-job training and development. Given the overlap between skill change goals and in-demand skills, providing opportunities for technical and SEB skill development may help people change in ways they desire as well as fulfill knowledge and skill gaps in the workforce.

Additionally, while many people cited skill change goals related to social engagement and STEM, there were fewer goals related to skills such as teaching and mechanical. Organizations can use the skill change goal categorizations and frequencies to help identify goals that may be popular among many workers (i.e., communication) and ones that are more likely to

predict fit for specific roles (i.e., teaching). For example, organizations can offer communication training to all employees, but for employees who express an interest in teaching, for whom there are likely to be less, they may be offered the opportunity to facilitate such training or put into roles that allow them to teach others and further develop that skill.

The Relationship Between Skill Change Goals and Perceptions of Current Skills

The results of this study indicated that people want to develop SEB skills that are inversely related to their perceptions of current SEB skills. This aligns with the personality psychology literature as people tend to cite personality change goals that are inversely related to their current personality traits (Baranski et al., 2107; Baranski et al., 2020). This makes sense as people may have more to gain professionally by developing in the ways in which they are weakest. For example, an engineer who desires to be promoted to management may be high in self-management and low in social engagement skills. He will likely gain more professionally and achieve his goal by increasing his abilities to manage and persuade others than by increasing his already-high skills related to attention to detail and persistence. For people who wish to develop SEB skills, supervisors may try to create opportunities to use them or provide feedback on their performance that relates to these skills. Both providing opportunities for mastery and providing feedback are thought to enhance motivation and performance (Wood & Bandura, 1989).

In contrast to the results surrounding SEB skill change goals and perceptions of current skills, more Knowledge and Technical skill change goals, such as computers and mechanical goals, were positively related to perceptions of current skill levels. It seems that people are more likely to cite technical goals that align with their perceptions of current knowledge and skills. This makes sense as people may wish to develop professional expertise in an area as opposed to

cultivating skills that are unrelated to their current career trajectory. For example, the engineer mentioned above will be more likely to obtain a promotion by further advancing his engineering skills than by increasing his therapy and counseling or marketing skills.

Another factor to consider is that developing technical skills may be solely beneficial for one's career, whereas developing SEB skills may have greater implications outside of work performance (M. Mugayar-Baldgocchi, personal communication, March 29, 2022). People may cite SEB skills that they lack and may even be less directly related to their jobs due to their perception that developing these skills could enhance multiple domains of their lives. Using the engineer as an example, he may find that increasing Social Engagement not only help him attain a promotion but also leads to making new friends or connecting more with the people around him.

As far as majors and skill change goals, there were few significant results. However, the results that were significant generally aligned with the findings surrounding the positive relationship between Knowledge and Technical skill change goals and current Knowledge and Technical skills. For instance, business majors in both samples were significantly less likely to cite skill change goals related to science. This makes sense as people pursuing business careers likely do not benefit much professionally by gaining knowledge and skills in science.

Gender Differences in Perceptions of Skills and Skill Change Goals

As far as gender differences in perceptions of current skills and skill change goals, the results indicated substantial differences in self-reported knowledge and skills but not in goals to develop skills. The largest effect sizes for differences in perceptions of knowledge and skills tended to be in knowledge and technical skills or "hard" skills such as "Computers and Electronics," "Physics," and "Mathematics." "Troubleshooting" also showed large gender

differences favoring men in both samples. This aligns with social role theory, with men either perceiving themselves as having or actually developing greater technical or "hard" knowledge and skills than women (Eagly, 1987). This also aligns with previous empirical findings that suggest men tend to be more skilled than women in physical sciences, business, electronics and technology, geography, history, and physics (Ackerman et al., 2001). As far as perceptions of SEB skills, men reported greater levels of Resilience in both samples, and women reported greater levels of Cooperation Skills. This finding also aligns with social role theory, with men being taught to be strong and tough and women taught to be nurturing and helpful (Eagly, 1987). Social role theory would suggest that women may perceive cooperation skills to be more expected, important, and valuable and make greater efforts to develop and display them, whereas men feel this way about Resilience skills (Eagly, 1987).

Even though there were large gender differences in perceptions of current STEM skills, there were not significant differences in men's and women's desires to develop STEM skills, which was the most commonly cited Knowledge and skill change goal. There were also not significant differences in men's and women's desires to develop SEB skills, which were also frequently cited. This would indicate that even if men and women perceive themselves as good at different things, their goals to improve their skills are largely similar. Given this, interventions, training, and employee development programs should not necessarily be targeted by gender. However, because either men perceive themselves, or actually have, greater Knowledge and Technical skills currently, they may experience increased self-efficacy, motivation, and, ultimately, performance in STEM (Vroom, 1964). Women may need more encouragement and/or initiatives that focus on enhancing their self-efficacy or their baseline skillset in order to meet their STEM-related goals. This finding aligns less with social role theory as it would appear

women are still interested in improving STEM skills, regardless of their perceptions of their current skills or their social roles (Eagly, 1987).

Perceptions of Social, Emotional, and Behavioral Skill Development During the Transition to Work

Moving onto the longitudinal analysis, perceptions of SEB skills showed moderate rank-order stability. This is consistent with personality literature, which would suggest that rank order is not likely to change substantially over a four-month period but may change more at this age and during this transition than later in life (Roberts & DelVechhio, 2000). Given that the rank order of SEB skills is unlikely to change dramatically in the first four months of a job, these skills can be assessed and utilized for selection purposes. As far as mean-level changes, one unexpected trend was that people reported decreases in SEB skills throughout the transition to work. These could be temporary decreases as people's first few months on a job are largely focused on more technical aspects of their work. These may also be due to changes in the standards for which they evaluate themselves. For instance, someone who has exceptional social engagement skills relative to their college peers may enter a sales job and have a new reference group of experienced professionals who all excel in social engagement skills. As far as employee development, new employees may benefit from increased opportunities to utilize these skills as well as training focused on developing them. Supervisors may also play a critical role as far as modeling SEB skills on the job, providing opportunities for new employees to utilize them, and providing employees feedback on SEB skills (Wood & Bandura, 1989). As far as implications for selection, hiring managers may look for people who exceed the SEB skill requirements as it may be likely that their skills decrease during the transition to work.

The longitudinal analysis also indicated that gender and goals are related to perceptions of SEB skill levels but not their rate of change. There were gender differences in perceptions of Cooperation, Self-Management, and Resilience at Time 1, but no differences in their rates of change. On average, men may benefit from opportunities to develop Cooperation and Self-Management skills, whereas women may benefit from developing more Resilience. That said, how much each of these skills matters may depend on the job itself. There were also differences in perceptions of Social Engagement, Self-Management, and Innovation depending on if people cited a matching skill-change goal. There were also marginally significant slopes (p=.06) for Resilience and Social Engagement, which may indicate that rates of change would be different over a longer period of time.

Strengths, Limitations, and Future Research Directions

There were several strengths in this study. First, we used two samples. This allowed us to test most of our hypotheses with a replication sample and compare how effects differed across samples. Additionally, both samples were very ethnically diverse, and Sample 1: Prolific was diverse in age as well. Another strength of this study was the focus on the period of transition from college to work. This is an important period as it involves a lot of change and professional growth and development. A greater understanding of how skills function and develop during this transition may contribute to better onboarding and training of new employees. Lastly, this study involved an in-depth analysis and extensive coding of skill change goals. This allowed for a rich understanding of how people wish to develop their workplace skills.

One of the main limitations of this study was the fact that the skills and knowledge measures were self-reported. There is evidence to suggest that people's perceptions of their own abilities can be inaccurate, and this is one way in which future research on this topic could

improve (Dunning, 2011). While self-reported skill levels give insight into people's perceptions of their own skills, comparing these to other, more objective measures of skills may give additional insight into the accuracy of self-reported skills as well as research questions specific to this study such as how skill development goals relate to skills, how skills differ by gender, and how skills develop during the transition to work.

Another limitation was the short duration of the longitudinal aspect of the study. There may have been greater or more meaningful changes one or two years after transitioning to full-time work relative to a few months afterward. The first couple months of a new job may be largely training, and new skills may develop more after longer periods of time.

An additional limitation was the possibility of measurement invariance for the perceptions of current skills items and scales. This may have contributed to the gender differences reported in the results.

Conclusion

Overall, this study had several implications for skill development in education and in organizations. The results indicated that people want to develop needed skills such as programming and communication skills. Additionally, while men tend to self-report higher technical skills, there are no significant gender differences as far as the desire to develop SEB and STEM skills. This would suggest that interventions and employee development initiatives targeting STEM and SEB skills should be equally targeted towards both genders, with potentially a greater emphasis on self-efficacy for women.

The results of the longitudinal analysis indicated that perceptions of SEB skills tend to decrease during the initial transition to work, and men and women report differences in Cooperation, Self-Management, and Resilience at the start of work. Lastly, while there were

differences in perceptions of SEB skill levels for people who cited a related change goal, rates of change across time did not differ depending on skill change goals. These findings indicate that providing opportunities to use and develop all SEB skills at the onset of work may be beneficial to new employees who have recently transitioned from school to work, regardless of gender or personal skill development goals.

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Table 1

Characteristics of Sample 1: Prolific (Nationally Representative Sample)

Variable	*Mean*	*SD*	*N*	*%*
Age	45.8	16.1		
Gender				
Male			375	48.8%
Female			383	49.9%
Other or Prefer not to say			10	1.3%
Ethnicity				
Asian/Asian			57	7.4%
Black/African			96	12.5%
Latino/Hispanic			26	3.4%
Native American/First Nations			2	0.3%
White/European			549	71.5%
Other or Prefer not to say			38	4.9%
Education				
Less than high school			2	0.3%
High school or GED			78	10.2%
Associate's degree (1 to 2-year program)			80	10.4%
Some college			149	19.4%
College or undergraduate degree (4-year program)			284	37.0%
Graduate degree (e.g., M.D., Ph.D.)			175	22.8%
Relationship status				
Married			320	41.7%
In a long-term relationship (but not married)			129	16.8%
Divorced			74	9.6%
Widowed			12	1.6%
Single			226	29.4%
Prefer not to say			7	0.9%

Note. N=768.

Table 2

Characteristics of Sample 2: College Graduates

Variable	*Mean*	*SD*	*N*	*%*
Age	22.78	2.97		
Gender				
Female			572	70.00%
Male			225	27.54%
Other or Prefer not to say			20	2.45%
Ethnicity				
Asian/Pacific Islander			283	34.64%
Black/African American Heritage			37	12.50%
Latino/Hispanic Heritage			184	22.52%
Native American/First Nations			1	0.12%
White/European			279	34.15%
Other/ NA			33	4.04%
Education				
High school or GED			7	.86%
Associate's degree (1 to 2-year program)			8	.98%
Some college			21	2.57%
College or undergraduate degree (4-year program)			774	94.74%
Graduate degree (e.g., M.D., Ph.D.)			6	.73%
NA			1	.12%
Relationship status				
Married			32	3.92%
In a long-term relationship (but not married)			165	20.20%
In a relationship (not married)			163	19.95%
Divorced			5	.61%
Single			437	53.49%
Prefer not to say			14	1.71%
NA			1	.12%

Note. N=817.

Table 3

Coding Categories for Skill Change Goals

Level 1. Broad Category	Level 2. Broad Subcategories	Level 3. Specific categories.
Social, Emotional, and Behavioral Skills	Social Engagement	Public Speaking, Persuasion, Leadership, Communication
	Cooperation	Social, Counseling, Teaching
	Self-Management	Organization, Task Management, Time Management, General Self-Management
	Innovation	General Artistic, Thinking/Problem-Solving
	Emotional Resilience	Emotion/Stress Management, Confidence
Knowledge and Technical Skills	STEM	Programming, Technical, Science, Math, Medical, General STEM
	Business	Finance, Accounting, Human Resources, Law/Politics, Marketing, General Business
	Mechanical	Mechanical, General Mechanical, Landscaping, Welding
	Foreign Language	
Abilities	Cognitive	Writing, Reading, Spatial, Memory, General Cognitive
	Physical	Strength, Dexterity, Typing, General Physical

Table 4

Sample 1: Prolific Perceptions of Social, Emotional, and Behavioral Skills Exploratory Factor Analysis

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Social Engagement					
Instructing	**.66**	.11	.01	.07	-.01
Managing others	**.80**	-.07	-.00	.04	-.00
Persuasion	**.74**	.07	-.08	.01	-.01
Speaking	**.57**	.20	.03	-.09	.01
Cooperation					
Helping People	.18	**.49**	.03	-.01	.09
Social Coordination	.03	**.83**	.05	.01	-.01
Social Perceptiveness	.01	**.84**	.01	.01	.05
Self-Management					
Attention to detail	.01	-.01	**.66**	.17	-.05
Dependability	-.03	.07	**.69**	-.02	.09
Persistence	.27	-.01	**.50**	.07	.04
Time Management	.22	.05	**.56**	-.04	-.01
Innovation					
Creative Thinking	.36	.02	.08	**.44**	.03
Design	.26	-.04	.05	**.60**	.04
Fine Arts	-.03	.30	-.14	**.58**	-.04
Resilience					
Emotion Regulation	-.01	.01	-.02	.04	**.98**
Stress Tolerance	.34	.02	.16	-.06	**.42**
Eigenvalues	6.78	1.47	1.25	.92	.81

Table 5

Sample 1: Prolific Perceptions of Only Knowledge and Technical Skills Exploratory Factor Analysis

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Biology	**.81**	-.02	-.09	-.12	.13	-.01	.20
Chemistry	**.87**	.04	.03	-.03	-.01	-.05	.13
Mathematics	**.50**	.17	.12	.13	-.21	.20	-.07
Physics	**.58**	-.01	.27	.08	.02	.02	.03
Science	**.68**	-.08	.060	.14	.03	.17	-.04
Economics & Accounting	.11	**.75**	-.01	.12	-.09	.04	-.10
Law & Government	.09	**.45**	.04	.01	.29	-.01	-.06
Personnel & Human Resources	-.09	**.45**	.02	-.02	.35	.22	-.00
Sales & Marketing	-.07	**.36**	.05	.06	.16	.19	.10
Transportation	.03	**.37**	.36	.01	.08	-.05	.20
Financial Management	.10	**.53**	.00	-.03	-.09	.27	-.01
Construction	-.00	.11	**.84**	-.18	-.01	-.04	.00
Engineering & Technology	.24	.05	**.44**	.32	.00	-.01	-.14
Mechanics	.06	-.05	**.77**	.06	-.05	.10	.01
Production & Processing	-.01	.37	**.40**	.09	.12	.02	.09
Public Safety & Security	-.01	.28	**.41**	.01	.32	-.04	.08
Repairing	-.06	-.05	**.79**	.15	.00	.04	.03
Computers & Electronics	-.03	.04	.00	**.81**	.02	-.03	.05
Programming	.05	-.03	-.01	**.83**	-.00	-.08	.02
Technology Design	.04	.04	.21	**.55**	.07	.10	-.04
Troubleshooting	.03	.01	.32	**.40**	-.05	.15	.05
Medicine & Dentistry	.35	.05	-.08	.02	**.40**	-.14	.17
Psychology	.10	-.05	.03	-.01	**.83**	.01	-.05
Sociology & Anthropology	.12	.06	-.05	.01	**.69**	.08	-.02
Therapy & Counseling	-.05	-.03	.07	.04	**.72**	.15	-.02
Communications & Media	.01	.06	-.03	-.09	.14	**.70**	.05
Customer Service	-.07	.24	-.13	-.02	.02	**.37**	.26
Office Work	-.07	.28	-.22	.15	.00	**.36**	.04
Teaching & Course Design	.03	.05	.10	.05	.34	**.40**	-.00
Complex Problem Solving	.25	.02	.06	.05	.01	**.59**	-.06
Writing	.06	-.03	-.10	-.04	.25	**.58**	.01
Food Production	.06	.23	.21	-.06	.16	-.10	**.34**
Body Coordination	.01	.02	.05	0	-.07	.27	**.62**
Finger Dexterity	-.02	-.01	.06	.10	-.03	.31	**.57**
Physical Strength	.13	.00	.27	.02	-.001	.14	**.41**
Eigenvalues	10.05	3.34	2.49	2.03	1.59	1.38	1.02

Table 6

Sample 2: College Graduates Perceptions of Social, Emotional, and Behavioral Skills Confirmatory Factor Analysis

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Social Engagement					
Instructing	.73				
Managing others	.72				
Persuasion	.64				
Speaking	.73				
Cooperation					
Helping People		.60			
Social Coordination		.81			
Social Perceptiveness		.82			
Self-Management					
Attention to detail			.56		
Dependability			.68		
Persistence			.69		
Time Management			.63		
Innovation					
Creative Thinking				.71	
Design				.68	
Fine Arts				.62	
Resilience					
Emotion Regulation					.73
Stress Tolerance					.78

Note. CFI=.91, TLI=.89, RMSEA=.07, SRMR=.05, Chi Square 505.01 df=94 p=.00

Table 7

Sample 1: Prolific Correlations between Big Five Personality Traits and Perceptions of Social, Emotional, and Behavioral Skills

Variable	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Social Engagement	3.01	.94	(.83)									
2. Cooperation	3.35	.96	.65	(.84)								
3. Self-Management	3.73	.80	.60	.52	(.80)							
4. Resilience	3.39	.99	.54	.60	.56	(.77)						
5. Innovation	2.83	.90	.47	.33	.39	.29	(.69)					
6. Extraversion	3.01	.88	.58	.37	.43	.36	.38	(.77)				
7. Agreeableness	3.90	.76	.18	.34	.28	.29	.10	.23	(.78)			
8. Conscientiousness	3.82	.84	.32	.20	.61	.34	.18	.42	.31	(.83)		
9. Negative Emotionality	2.45	1.00	-.37	-.22	-.41	-.54	-.22	-.49	-.32	-.54	(.87)	
10. Openness	3.88	.79	.24	.21	.21	.15	.47	.32	.24	.14	-.17	(.79)

Note. All correlations are significant. Alphas are on the diagonal.

Table 8

Sample 2: College Graduates Correlations between Big Five Personality Traits and Perceptions of Social, Emotional, and Behavioral Skills

Variable	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Social Engagement	3.07	.87	(.79)									
2. Cooperation	3.40	.90	.63	(.77)								
3. Self-Management	3.75	.72	.49	.44	(.74)							
4. Resilience	3.35	.95	.48	.46	.45	(.73)						
5. Innovation	2.75	.94	.36	.31	.22	.15	(.71)					
6. Extraversion	3.22	.83	.49	.34	.25	.22	.20	(.79)				
7. Agreeableness	3.87	.64	.19	.30	.20	.20	.11	.19	(.70)			
8. Conscientiousness	3.63	.76	.19	.12	.54	.21	-.01	.25	.26	(.76)		
9. Negative Emotionality	2.99	.92	-.22	-.13	-.21	-.48	-.05	-.33	-.25	-.32	(.83)	
10. Openness	3.76	.69	.16	.16	.03	.06	.49	.20	.13	-.02	-.02	(.69)

Note. All Correlations above .06 are significant. Alphas are on the diagonal.

Table 9

Frequencies for Goals to Change Skills

Sample	Sample 1: Prolific	Sample 1: Prolific	Sample 2: College Graduates	Sample 2: College Graduates
Skill Change Goal[1]	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Social, Emotional, Behavioral	335	44.49%	321	48.13%
Social Engagement	148	19.65%	142	21.29%
Public Speaking	31	4.12%	24	3.60%
Persuasion	12	1.59%	6	.90%
Leadership	39	5.18%	35	5.25%
Communication	66	8.76%	75	11.24%
Cooperation	62	8.23%	53	7.95%
Social	47	6.24%	28	4.20%
Counseling	10	1.32%	21	3.15%
Teaching	5	.66%	4	.60%
Self-Management	53	7.04%	56	8.40%
Organization	11	1.46%	9	1.35%
Task Management	14	1.86%	12	1.80%
Time Management	23	3.05%	29	4.35%
General Self-Management	5	.66%	6	.90%
Innovation	49	6.51%	46	6.90%
Thinking/ Problem Solving	14	1.86%	24	3.60%
General Artistic	35	4.65%	22	3.30%
Emotional Resilience	23	3.05%	24	3.60%
Emotion/Stress Management	20	2.66%	19	2.85%
Confidence	3	.40%	5	.75%
Knowledge and Technical	350	46.48%	332	49.78%
STEM	226	30.01%	243	36.43%
Programming	114	15.14%	109	16.34%
Technical	46	6.12%	52	7.80%
Science	26	3.45%	39	5.85%
Math	31	4.12%	28	4.20%
Medical	8	1.06%	14	2.10%
Business	39	5.18%	57	8.55%
Finance	15	1.99%	33	4.95%
Human Resources	1	.13%	4	.60%
Law/ Politics	3	.40%	9	1.35%
Marketing	7	.93%	3	.45%
General Business	9	1.20%	6	.90%
Mechanical	39	5.18%	27	4.05%
Mechanical	27	3.59%	22	3.30%
General Mechanical	4	.53%	4	.60%
Landscaping	5	.66%	1	.15%
Foreign Language	46	6.11%	5	.75%

[1] The "Other" category is not included. "Other" included "None" and "NA." N=18 for Sample 1: Prolific. N=143 for Sample 2: College Graduates. Within the Sample 1: Prolific "Other" category, 9 participants said "NA" and 9 had "Other" responses. Within the Sample 2: College Graduates "Other" category, 136 said "NA" and 7 had "Other" responses.

Abilities	68	9.03%	14	2.10%
Cognitive	48	6.37%	12	1.80%
Writing	28	3.72%	7	1.05%
Spatial	6	.80%	1	.15%
Memory	7	.93%	2	.30%
General Cognitive	5	.66%	1	.15%
Physical	20	2.66%	2	.30%
Strength	6	.80%	0	0%
Dexterity	5	.66%	1	.15%
Typing	6	.80%	0	0%

Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates. Percentages were calculated relative to the sample. The following categories had less than 4 people in both samples and are not included in the table: General Social, General STEM, Accounting, Welding, Reading, and General Physical.

Table 10

Correlations between Skill Change Goals and Perceptions of Current Skills

Goals to Change Skills	**Current Skill Scale**	**Correlation with Matching Current Skill Scale**	
Social, Emotional, & Behavioral Skill Goals	**Social, Emotional, & Behavioral Skills**	**Sample 1: Prolific**	**Sample 2: College Graduates**
Social Engagement Goal	Social Engagement Skill	-.08*	-.21**
Cooperation Goal	Cooperation Skill	-.10**	.06
Self-Management Goal	Self-Management Skill	-.06	-.11**
Innovation Goal	Innovation Goal Skill	.04	.00
Resilience Goal	Resilience Skill	-.10**	-.16**
Knowledge & Technical Skill Goals	**Knowledge & Technical Skills**		
Business Goal	Business Skill	-.01	.00
Computers Goal	Computers Skill	.11**	.10**
Mechanical Goal	Mechanical Skill	.12**	.03
Science Goal	STEM Skill	-.00	.05
	Social Science Skill	.05	.05

Note. Correlations with a * are significant at the .05 level. Correlations with a ** are significant at the .01 level.

Table 11

Gender Differences in Perceptions of Knowledge and Technical Skills: Cohen's d

OSKI Skills Categories	Sample 1: Prolific	Sample 2: College Graduates
Knowledge		
Biology	.14	-.08
Chemistry	.51	.15
Communications and Media	.09	-.13
Computers and Electronics	.80	.88
Construction	.75	.49
Customer Service	-.21	-.25
Economics and Accounting	.53	.36
Engineering and Technology	.86	.72
Food Production	.05	-.06
Law and Government	.37	.26
Mathematics	.61	.30
Mechanics	.75	.56
Medicine and Dentistry	.01	-.16
Office Work	-.36	-.11
Personnel and Human Resources	.05	-.13
Physics	.74	.36
Production and Processing	.50	.32
Psychology	-.07	-.41
Public Safety and Security	.47	.18
Sales and Marketing	.12	-.01
Sociology and Anthropology	.01	-.18
Teaching and Course Design	.21	.08
Therapy and Counseling	.01	-.31
Transportation	.63	.47
Technical Skills		
Body Coordination	.18	.14
Complex Problem Solving	.38	.24
Financial Management	.27	.33
Finger Dexterity	.02	.09
Physical Strength	.66	.53
Programming	.59	.66
Repairing	.88	.58
Science	.58	.14
Sustained Attention	.10	.09
Technology Design	.67	.64
Troubleshooting	.81	.86
Writing	.05	-.16
Adaptability	.27	.00
Independence	-.16	-.05

Note. In Sample 1: Prolific, N Males=375, N Females=383. In Sample 2: College Graduates, Prolific N Males=225, N Females=572. A negative value indicates women scored higher on that skill. * indicates SEB skill.

Table 12

Gender Differences in Perceptions of Social, Emotional, and Behavioral Skills: Cohen's d

SEB Skills	Sample 1: Prolific	Sample 2: College Graduates
Social Engagement	.15	.04
Cooperation	-.18	-.24
Self-Management	.01	-.24
Innovation	.33	-.11
Resilience	.25	.27

Note. In Sample 1: Prolific, N Males=375, N Females=383. In Sample 2: College Graduates, Prolific N Males=225, N Females=572. A negative value indicates women scored higher on that skill. * indicates SEB skill.

Table 13

Gender Differences in Skill Change Goals

Skill Change Goals	Sample 1:Prolific	Sample 2: College Graduates
Level 1: NA, Knowledge and Technical, Abilities, & SEB Skills	$X^2(3, 758) = [6.326]$, p = [.097]	Not Significant, p = [.327].
Level 2: STEM, Business, Mechanical, and Foreign Language	$X^2(3, 346) = [4.499]$, p = [.212].	Not Significant, p = [.450].
Level 2: Physical & Cognitive Abilities	$X^2(1, 67) = [2.162]$, p = [.14].	Not Significant, p = [.692].
Level 2: Social Engagement, Cooperation, Self-Management, Innovation, Resilience	$X^2(4, 326) = [.742]$, p = [.946].	$X^2(4, 313) = [6.679]$, p = [.154].

Note. Fisher's Exact Test was used when there were not sufficient frequencies for Chi-Square tests.

Table 14

Rank-Order Stability of Perceptions of Social, Emotional, and Behavioral Skills

	Wave 1 to 2		Wave 2 to 3		Wave 1 to 3	
	r	95% CI	*r*	95% CI	*r*	95% CI
Social Engagement Time	.73	[.69, .77]	.71	[.66, .76]	.65	[.60, .70]
Cooperation	.66	[.61, .70]	.64	[.58, .70]	.60	[.54, .66]
Self-Management	.68	[.64, .73]	.66	[.60, .71]	.61	[.55, .67]
Innovation	.75	[.71, .79]	.72.	[.68, .77]	.69	[.65, .74]
Resilience	.64	[.59, .69]	.64	[.58, .70]	.57	[.51, .63]
SEB Average	.69		.66		.62	

Note. *r* = rank-order stability (correlation coefficient); 95% CI = 95% confidence interval. SEB Average is the mean stability coefficient for all skills across each wave. Sample 2: College Graduates was used for this analysis.

Table 15

Mean-Level Changes Across Time in Perceptions of Social, Emotional, and Behavioral Skills: Cohen's d

SEB Skills	Wave 1 to 2 *d*	Wave 2 to 3 *d*	Full Study *d*
Social Engagement Time	-.19	-.06	-.25
Cooperation	-.13	-.11	-.25
Self-Management	-.12	-.12	-.24
Innovation	.00	-.12	-.12
Resilience	-12	-.01	-.13

Note. *d* = Cohen's *d*-value (standardized difference score). Sample 2: College Graduates was used for this analysis.

Table 16

Results of the Latent Growth Curves Modeling Intercepts and Slopes of Perceptions of Social, Emotional, and Behavioral Skills

	Intercept				Slope				Fit				
	M	*SE(M)*	σ^2	*SE*(σ^2)	*M*	*SE(M)*	σ^2	*SE*(σ^2)	*RMSEA*	X^2	*CFI*	*TLI*	*SRMR*
Social Engagement	3.07	.03	.60	.05	**-.04**	.01	.01	.01	.04	2.28	1.00	.99	.01
Cooperation	3.41	.03	.59	.06	**-.05**	.01	.01	.01	.00	.91	1.00	1.00	.01
Self-Management	3.75	.03	.40	.04	**-.05**	.01	.01	.01	.00	.15	1.00	1.00	.00
Innovation	2.76	.03	.68	.06	-.01	.01	.01	.01	.07	5.22	.99	.98	.02
Resilience	3.35	.03	.61	.07	**-.03**	.01	.01	.01	.02	1.38	1.00	1.00	.01

Note. Slope values in boldface are statistically significant ($p < .05$). At Wave 1, N= 815 participants. All models had 1 degree of freedom. RMSEA = root-mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root-mean-square residual. Sample 2: College Graduates was used for this analysis.

Table 17

Gender Differences in Intercepts and Slopes of Perceptions of Social, Emotional, and Behavioral Skills

	Intercept		Slope			Fit			
	B	95% CI	B	95% CI	RMSEA	X^2	CFI	TLI	SRMR
Social Engagement	.02	[-.06, .10]	.05	[-.11, .20]	.02	2.45	1.00	1.00	.01
Cooperation	**-.13**	[-.22, -.05]	-.06	[-.24, .11]	.02	2.56	1.00	1.00	.01
Self-Management	**-.11**	[-.19, -.04]	.16	[-.01, .33]	.02	2.51	1.00	1.00	.01
Innovation	-.05	[-.13, .03]	.15	[-.07, .37]	.05	6.42	.99	.98	.02
Resilience	**.16**	[.07, .24]	-.12	[-.32, .08]	.02	2.46	1.00	1.00	.02

Note. The coefficients demonstrate the magnitude and direction of gender differences in the intercepts and slopes (Men=1, Not men=0). Negative coefficients indicate higher intercepts or more positive slopes among women compared with men, and positive coefficients indicate lower intercepts or less positive slopes among women compared with men. Boldface indicates statistically significant gender differences ($p < .05$). At Wave 1, the sample contained 815 participants. All models had 2 degrees of freedom. CI = 95% confidence interval; RMSEA = root-mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root-mean-square residual. Sample 2: College Graduates was used for this analysis.

Table 18

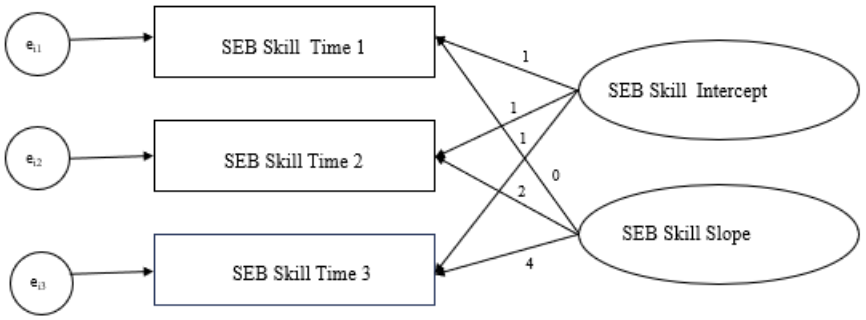
Goal Influence on Intercepts and Slopes of Perceptions of Social, Emotional, and Behavioral Skills

	Intercept		Slope		Fit				
	B	CI	B	CI	RMSEA	X^2	CFI	TLI	SRMR
Social Engagement	**-.23**	[-.30, -.16]	.15	[-.01, .30]	.01	2.31	1.00	1.00	.01
Cooperation	.06	[-.02, .14]	-.15	[-.33, .04]	.00	1.95	1.00	1.00	.01
Self-Management	**-.12**	[-.20, -.04]	.08	[-.09, .25]	.00	.35	1.00	1.01	.00
Innovation	-.01	[-.09, .07]	-.01	[-.24, .21]	.07	9.8	.99	.97	.02
Resilience	**-.19**	[-.27, -.11]	.25	[-.01, .52]	.04	4.02	1.00	.99	.02

Note. The coefficients demonstrate the magnitude and direction of goal differences in the intercepts and slopes (goal = 1, not goal =0). Negative coefficients indicate higher intercepts or more positive slopes among people who did not cite a matching SEB skill change goal compared with those who did, and positive coefficients indicate lower intercepts or less positive slopes among people who did not cite a matching SEB goal compared with those who did. Boldface indicates statistically significant differences ($p < .05$). At Wave 1, the sample contained 815 participants. All models had 2 degrees of freedom. CI = confidence interval; RMSEA = root-mean-square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root-mean-square residual. Sample 2: College Graduates was used for this analysis.

Figure 1

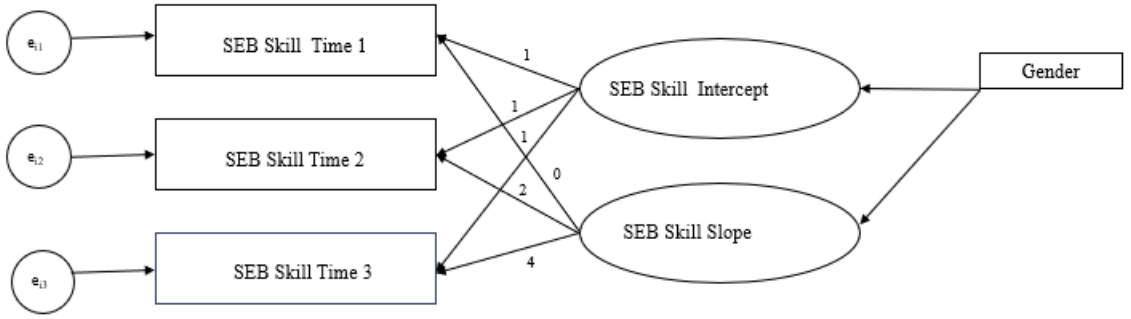
Perceptions of Social, Emotional, and Behavioral Skill Development Latent Growth Model



Note. Sample 2: College Graduates was used for this analysis.

Figure 2

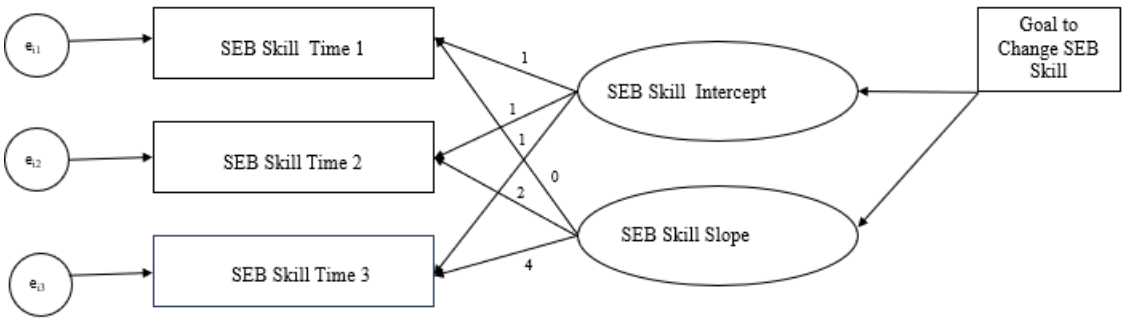
Perceptions of Social, Emotional, and Behavioral Skill Development Latent Growth Model with Gender



Note. Sample 2: College Graduates was used for this analysis.

Figure 3

Perceptions of Social, Emotional, and Behavioral Skill Development Latent Growth Model with Goals



Note. Sample 2: College Graduates was used for this analysis.

Appendix

Round 1 Coding Manual for Goals to Change Skills

Coding Manual Overview: This manual serves as a guide for open-ended coding responses explaining participants' desires to change their skills.

Coding Instructions:

1. Open your personal coding Excel spreadsheet. You will see a list of responses.
2. You will put each response in one of 9 categories. Put it in the category by putting a 1 in the corresponding column. The nine columns will be listed across the document.
3. First, you will code each response into one of the 9 bolded categories. Then, later on, you will be sent sheets to code them into the smaller subcategories that are listed below each of the nine categories. At this point, just focus on coding each response into one of the nine broad categories that are bolded below. You may use the preliminary subcategories as a guide on what types of responses go into each broad category.
4. There will also be a column that says "unsure" that you may mark "YES" in addition to your other code.

Categories

1. **STEM- "Intentions to be better at science, technology, engineering, or math."**

Example: "math and engineering skills" "application of scientific theories"

- Math - "calculus"
- Science - "psychology" "science" "biology"
- Medical - "medical skills such as CPR or saving someone from choking"
- Technology/Computers - "I wish I was better at technology and working with software and hardware" "learn my so
- Programming - "programming" "coding"

2. **Physical- "Intentions to be better at physical tasks"**

Example: "something that has to do with physical tasks"

- Strength/Endurance -"my physical strength and endurance"
- Dexterity - "fine motor skills"

3. **Social/Communication- "Intentions to be better at communicating, influencing, or working with other people"**

Example: "people skills" "therapy and counseling" "interpersonal skills" "customer relations," "social skills" "people interaction" "Speaking up for myself"

- Public Speaking - "public speaking" "speaking in front of others"

- Writing - “writing skills”
- Persuasion- “negotiation skills” “social interaction and persuasion”
- Leadership - “management skills” “giving good performance feedback”
- Cooperation - “getting along with others”

4. **General Cognitive- “Intentions to improve general cognitive skills or tasks”**

Example: “problem solving” “expanding and improving my vocabulary” “specific knowledge” “critical thinking skills”

- Spatial - “I want to better my spatial awareness”
- Memory - “memorization of information”
- Reading - “reading”

5. **Artistic- “Intentions to be better at artistic skills such as speaking another language or videography”**

Example: “I always wish to improve my artistic skills” “playing piano on a more advanced level” “culinary” “creative writing” “fine arts” “creativity”

- Graphic Design - “digital art”
- Drawing - “drawing techniques for art”
- Editing - “Video Editing”
- Foreign Language - “I would like to learn a foreign language” “German”

6. **Self-Management- “Intentions to better manage oneself with regard to productivity or emotions”**

Example: “Being a change agent. Fast Adaptability” “productivity” “emotions” “persistence” “attention to detail”

- Organization - “Organizational Skills” “administrative”
- Time Management - “time management” “balance time/ energy management”
- Concentration - “my ability to focus on a single task effortlessly” “concentration”
- Emotion/ Stress Management - “emotional regulation” “maintaining a level head when I’m upset”
- Confidence - “I wish to improve my confidence in my intelligence/ knowledge in certain areas.”

7. **Business- “Intentions to better understand or utilize business knowledge and skills”**

Example: “being able to understand more about how business works” “sales”

- Finance - “I want to develop better financial skills”
- Marketing - “marketing skills”
- Accounting - “My accounting skills because I am currently going to school for that. It is what I want to do with my career.”

- Human Resources –

8. **Mechanical/Construction- “Intentions to be better at mechanical tasks or have knowledge in such domains”**

Example: “building things” “home repair” “use of tools/ materials” “driving” “carpentry” “landscaping” “woodworking” “some type of trade work”

- Construction - “building and repairing things”
- Cars - “more things that I could do on my car”
- Welding - “learn to weld better”

9. **Other**

Example: “N/A” “Everything” “Swag”

Round 2 Coding Manual for Goals to Change Skills

Round 2 Coding Manual Overview: This manual serves as a guide for coding open-ended responses explaining participant's desires to change their skills.

Coding Instructions:

1. Open your personal coding Excel spreadsheet. You will see a list of responses.
2. You will put each response in one of 9 categories. Put it in the category by putting a 1 in the corresponding column. The nine columns will be listed across the document.
3. First you coded each response into one of the 9 bolded categories. Now you will be sent sheets to code them into the smaller subcategories that are listed below each of the nine categories. You may add a column that says "unsure" that you may mark "1" in addition to your other code. You may also add a "Notes" category. You can include any additional thoughts or questions there. If a response does not fit into one of the subcategories, put a 1 in the "None" column.
4. When people included two responses, code the first response. For example, "writing and biology" should be general cognitive as writing is the first response. However, also code focusing on the main point of the response. For example, "memorizing science" is abouts science and should be STEM. Another example of this is oral speaking for politics should be business/law- not Social/ Communication.

Categories

1. **STEM- "Intentions to be better at science, technology, engineering, or math."**

   Example: "math and engineering skills" "application of scientific theories"

   - Math - "calculus"
   - Science - "psychology" "science" "biology"
   - Medical - "medical skills such as CPR or saving someone from choking"
   - Technology/Computers - "I wish I was better at technology and working with software and hardware"
   - Programming - "programming" "coding"

2. **Physical- "Intentions to be better at physical tasks."**

   Example: "something that has to do with physical tasks"

   - Strength/Endurance -"my physical strength and endurance"
   - Dexterity - "fine motor skills"
   - Typing – "typing"

3. **Social/Communication- "Intentions to be better at communicating, influencing, or working with other people."**

Example: "people skills" "therapy and counseling" "interpersonal skills" "customer relations," "social skills" "people interaction" "Speaking up for myself"

- Public Speaking - "public speaking" "speaking in front of others"
- Persuasion- "negotiation skills" "social interaction and persuasion"
- Leadership/Management - "management skills" "giving good performance feedback"
- Social Skills - "getting along with others" "interacting with others" "interviewing"
- Counseling- "therapy" "counseling"
- Teaching – "teaching"

4. **General Cognitive- "Intentions to improve general cognitive skills or tasks"**

Example: "problem solving" "expanding and improving my vocabulary" "specific knowledge" "critical thinking skills" "creative thinking"

- Spatial - "I want to better my spatial awareness"
- Memory - "memorization of information"
- Reading - "reading"
- Writing- "writing" "creative writing"
- Thinking/Problem Solving – "problem solving"

5. **Artistic- "Intentions to be better at artistic skills such as speaking another language or videography"**

Example: "I always wish to improve my artistic skills" "playing piano on a more advanced level" "culinary" "fine arts" "creativity"

- Graphic Design - "digital art"
- Drawing - "drawing techniques for art"
- Editing - "Video Editing"
- Foreign Language - "I would like to learn a foreign language" "German"

6. **Self-Management- "Intentions to better manage oneself with regard to productivity or emotions"**

Example: "Being a change agent. Fast Adaptability" "productivity" "emotions" "persistence" "attention to detail" "body language"

- Organization - "Organizational Skills" "administrative"
- Time Management - "time management" "balance time/ energy management"
- Concentration - "my ability to focus on a single task effortlessly" "concentration"

● Emotion/ Stress Management - “emotional regulation” “maintaining a level head when I’m upset”
● Confidence - “I wish to improve my confidence in my intelligence/ knowledge in certain areas.”

7. **Business/Law- “Intentions to better understand or utilize business and legal knowledge and skills”**

Example: “being able to understand more about how business works” “sales”

● Finance - “I want to develop better financial skills”
● Marketing - “marketing skills”
● Accounting - “My accounting skills because I am currently going to school for that. It is what I want to do with my career.”
● Human Resources – “recruiting”
● Law/Politics- “law” “politics” “political science”

8. **Mechanical/Construction- “Intentions to be better at mechanical tasks or have knowledge in such domains”**

Example: “building things” “home repair” “use of tools/ materials” “driving” “carpentry” “landscaping” “woodworking” “some type of trade work”

● Construction - “building and repairing things”
● Cars - “more things that I could do on my car”
● Welding - “learn to weld better”
● Landscaping/Gardening – “gardening”

9. **Other**

Example: “N/A” “Everything” “Swag”

- NA
- All other

Special Notes:
* Writing has moved from Social Communication to General Cognitive
*The Business category has expanded to include law

Table 1A

All Items in the Occupational Knowledge and Skills Inventory (OSKI)

Items
Occupational Knowledge
Biology: plant, animal and cell functions
Chemistry: chemical processes and their applications
Communications and Media: conveying information using written, oral, and visual media
Computers and Electronics: computer hardware and software, including applications and programming
Construction: building materials, methods, and tools
Customer Service: handling customer needs and resolving service problems
Design: designing techniques, tools, and principles
Economics and Accounting: principles and practices of accounting, economics, and financial markets
Engineering & Technology: practical applications of engineering science and technology
Fine Arts: developing art forms, such as music, painting, or drama
Food Production: planting, growing, and harvesting food products
Law & Government: legal codes, court procedures, government regulations, and political processes
Managing others: leading other people and business planning
Mathematics: using arithmetic, algebra, geometry, calculus, and statistics
Mechanics: designing, using, repairing, and maintaining machines
Medicine and Dentistry: providing health care
Office Work: completing administrative and clerical work, such as word processing and managing records
Personnel and Human Resources: principles and procedures for recruiting, hiring, and training employees
Physics: physical principles, laws, and their applications
Production and Processing: overseeing manufacturing and distribution processes
Psychology: methods of research, assessment, and treatment of human behavior
Public Safety and Security: equipment, procedures, and strategies to promote security operations
Sales and Marketing: promoting and selling products or services
Sociology and Anthropology: theories of group behavior, societal trends, and human culture
Teaching and Course Design: applying methods and principles of instruction
Therapy and Counseling: applying principles and methods used in counseling
Transportation: principles and methods for moving people or goods by air, rail, sea, or road
Occupational Skills
Body Coordination: moving your arms, legs, and body together
Complex Problem Solving: figuring out the best way to solve a difficult problem
Creative Thinking: developing original ways to solve a problem
Financial Management: determining how money will be spent to get work done
Finger Dexterity: controlling your fingers to precisely to manipulate small objects
Helping People: understanding how to help others in need
Instructing: teaching people how to do something
Persuasion: convincing others to change their minds or behavior
Physical Strength: using muscle force to lift, push, pull, or carry objects
Programming: writing computer programs for various purposes
Repairing: fixing machines using tools
Science: using scientific rules and methods to solve problems
Social Coordination: Adjusting actions in relation to others' actions
Social Perceptiveness: understanding others' reactions and behaviors
Speaking: talking to others to convey information effectively
Sustained Attention: concentrating on a task without being distracted
Technology Design: building and adapting new technology
Time Management: managing your own time and the time of others

Troubleshooting: identifying and fixing problems in machines or technology
Writing: communicating effectively in writing
Adaptability: Being flexible and open to change (positive or negative)
Attention to detail: Thoroughly completing work tasks
Dependability: Fulfilling obligations and being reliable
Emotion Regulation: Maintaining composure and controlling emotions in difficult situations
Independence: Getting things done with little or no supervision
Persistence: Working towards long-term goals and overcoming obstacles
Stress Tolerance: Dealing calmly and effectively with high stress situations

Note. Participants were instructed to "Think and respond honestly about your level of knowledge and skill relative to other people. How skilled are you at /How much do you know about:" They responded to each item using a 5-point Likert-type scale, ranging from 1 = *Beginner*, 2 = *Basic*, 3 = *Skilled*, 4 = *Advanced*, 5 = *Expert*.

Table 2A

Perceptions of Social, Emotional, and Behavioral Skills Subscales

Items
Social Engagement
Instructing: teaching people how to do something
Managing others: leading other people and business planning
Persuasion: convincing others to change their minds or behavior
Speaking: talking to others to convey information effectively
Cooperation
Helping People: understanding how to help others in need
Social Coordination: Adjusting actions in relation to others' actions
Social Perceptiveness: understanding others' reactions and behaviors
Self-Management
Attention to detail: Thoroughly completing work tasks
Dependability: Fulfilling obligations and being reliable
Persistence: Working towards long-term goals and overcoming obstacles
Time Management: managing your own time and the time of others
Innovation
Creative Thinking: developing original ways to solve a problem
Design: designing techniques, tools, and principles
Fine Arts: developing art forms, such as music, painting, or drama
Resilience
Emotion Regulation: Maintaining composure and controlling emotions in difficult situations
Stress Tolerance: Dealing calmly and effectively with high stress situations

Note. Participants were instructed to "Think and respond honestly about your level of knowledge and skill relative to other people. How skilled are you at /How much do you know about:" They responded to each item using a 5-point Likert-type scale, ranging from 1 = *Beginner*, 2 = *Basic*, 3 = *Skilled*, 4 = *Advanced*, 5 = *Expert*.

Table 3A

Perceptions of Knowledge and Technical Skill Subscales

Items
STEM
Biology: plant, animal and cell functions
Chemistry: chemical processes and their applications
Mathematics: using arithmetic, algebra, geometry, calculus, and statistics
Physics: physical principles, laws, and their applications
Science: using scientific rules and methods to solve problems
Business
Economics and Accounting: principles and practices of accounting, economics, and financial markets
Law & Government: legal codes, court procedures, government regulations, and political processes
Personnel and Human Resources: principles and procedures for recruiting, hiring, and training employees
Sales and Marketing: promoting and selling products or services
Financial Management: determining how money will be spent to get work done
Mechanical
Construction: building materials, methods, and tools
Mechanics: designing, using, repairing, and maintaining machines
Repairing: fixing machines using tools
Computers
Computers and Electronics: computer hardware and software, including applications and programming
Programming: writing computer programs for various purposes
Technology Design: building and adapting new technology
Social Science
Psychology: methods of research, assessment, and treatment of human behavior
Sociology and Anthropology: theories of group behavior, societal trends, and human culture
Therapy and Counseling: applying principles and methods used in counseling

Note. Participants were instructed to "Think and respond honestly about your level of knowledge and skill relative to other people. How skilled are you at /How much do you know about:" They responded to each item using a 5-point Likert-type scale, ranging from 1 = *Beginner*, 2 = *Basic*, 3 = *Skilled*, 4 = *Advanced*, 5 = *Expert*.

Table 4A

Sample 2: College Graduates Perceptions of Social, Emotional, and Behavioral Skills Correlations at Three Time Points

Variable	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1. T1 Social Engagement	3.07	.87	(.79)														
2. T1 Cooperation	3.40	.90	.63	(.77)													
3.T1 Self-Management	3.75	.72	.49	.44	(.74)												
4. T1 Resilience	3.35	.95	.48	.46	.29	(.73)											
5. T1 Innovation	2.75	.94	.36	.31	.22	.15	(.71)										
6. T2 Social Engagement	2.91	.86	**.73**	.50	.38	.34	.30	(.79)									
7. T2 Cooperation	3.28	.93	.56	**.66**	.36	.32	.26	.66	(.81)								
8. T2 Self-Management	3.66	.75	.44	.34	**.68**	.40	.18	.52	.50	(.77)							
9. T2 Resilience	3.24	.93	.39	.37	.35	**.64**	.15	.50	.49	.55	(.72)						
10.T2 Innovation	2.76	.92	.32	.25	.14	.09	**.75**	.43	.36	.29	.26	(.72)					
11. T3 Social Engagement	2.86	.86	**.65**	.46	.33	.29	.32	**.71**	.51	.39	.35	.37	(.78)				
12. T3 Cooperation	3.18	.92	.47	**.60**	.27	.22	.22	.46	**.64**	.36	.34	.23	.65	(.81)			
13. T3 Self-Management	3.57	.76	.38	.35	**.61**	.29	.18	.41	.53	**.66**	.35	.19	.54	.53	(.81)		
14. T3 Resilience	3.23	.97	.36	.40	.34	**.57**	.17	.40	.41	.43	**.64**	.19	.51	.58	.54	(.78)	
15. T3 Innovation	2.64	.91	.33	.28	.13	.09	**.69**	.37	.28	.20	.16	**.72**	.52	.37	.34	.29	(.75)

Note. N= 815 at Time 1, N= 455 at Time 2, N= 395 at Time 3. Bolded text indicates and SEB skill at one time point correlated with the same skill at another time point.

Table 5A

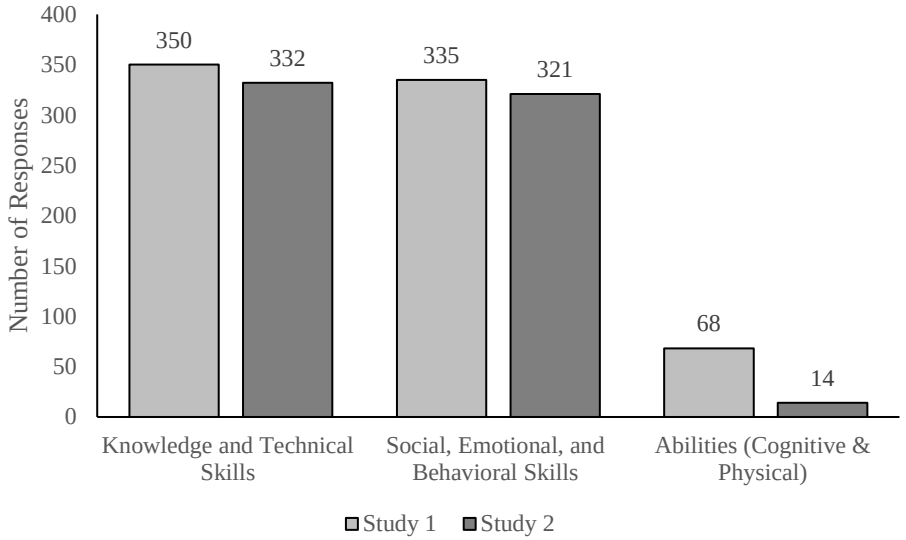
Sample 2: College Graduates Means, Standard Deviations, and Alpha Reliabilities of Perceptions of Social, Emotional, and Behavioral Skills at Time Points

Variable	*Mean*	*SD*	α	*Mean*	*SD*	α	*Mean*	*SD*	α
1. Social Engagement	3.07	.87	.79	2.91	.86	.79	2.86	.86	.78
2. Cooperation	3.40	.90	.77	3.28	.93	.81	3.18	.92	.81
3. Self-Management	3.75	.72	.74	3.66	.75	.77	3.57	.76	.81
4. Resilience	3.35	.95	.73	3.24	.93	.72	3.23	.97	.78
5. Innovation	2.75	.94	.71	2.76	.92	.72	2.64	.91	.75

Note. Each scale had 2-4 Items.

Figure 1A

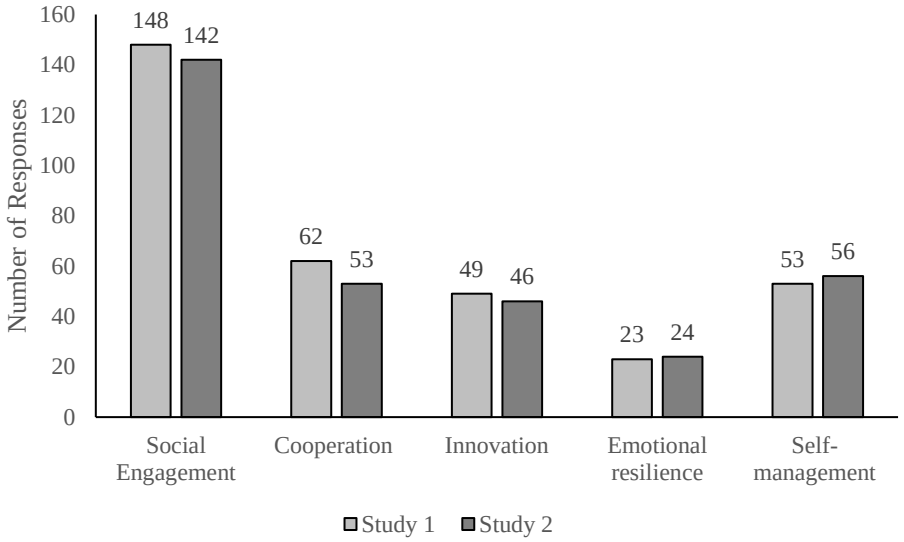
Goals to Change Knowledge and Skills



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.

Figure 2A

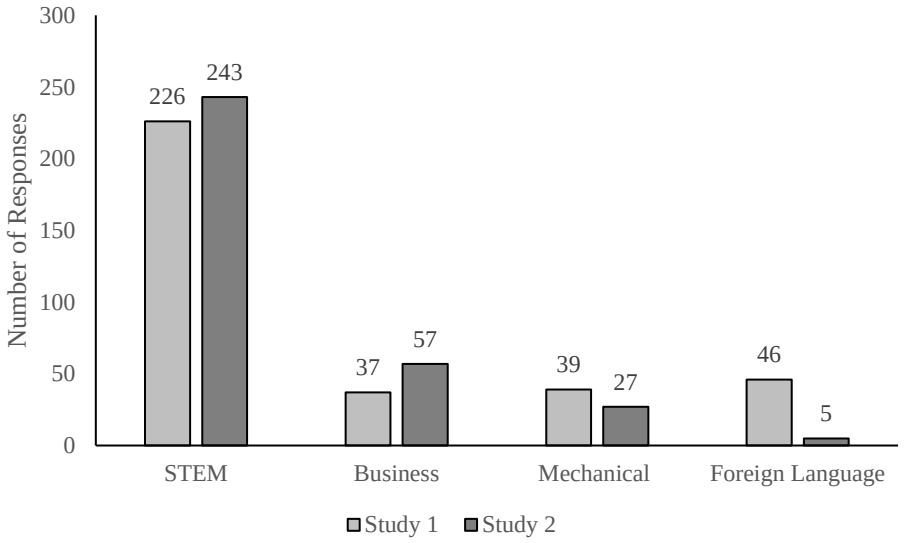
Social, Emotional, and Behavioral Skill Change Goals



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.

Figure 3A

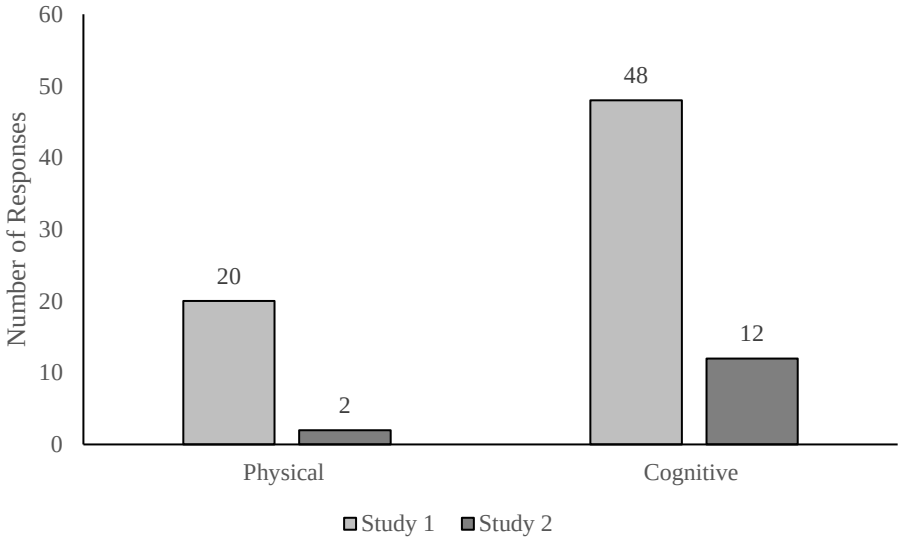
Knowledge and Technical Skill Change Goals



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.

Figure 4A

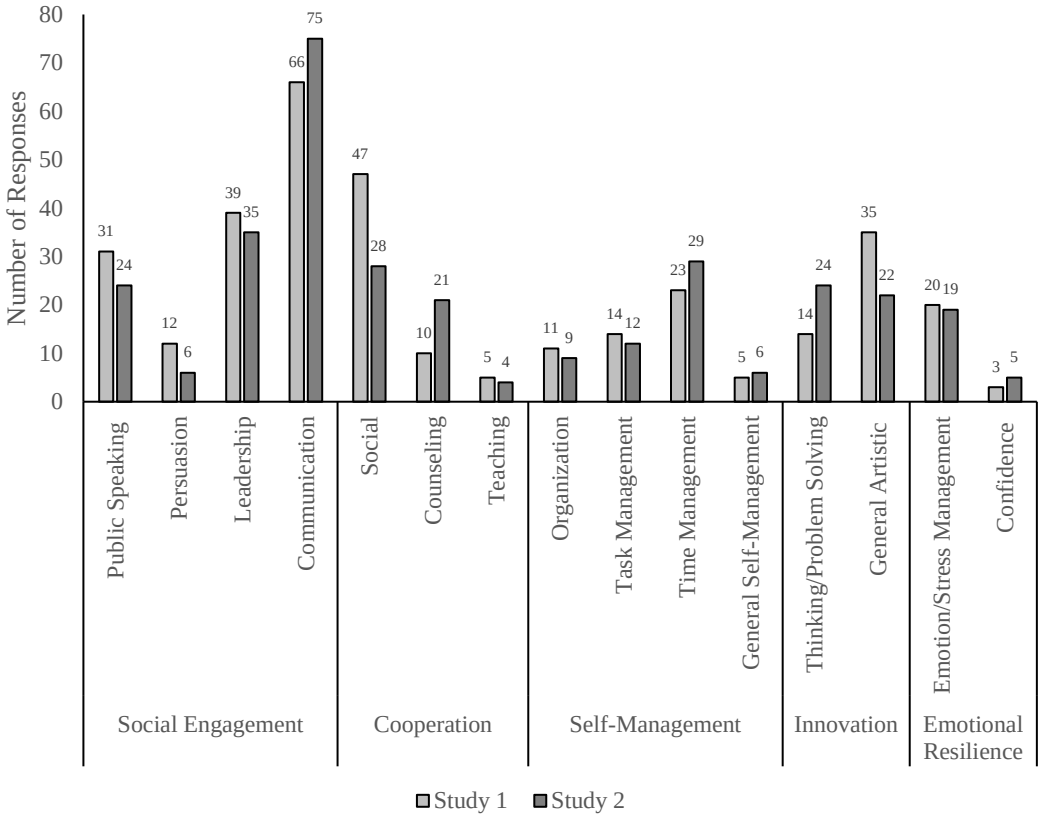
Abilities Change Goals



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.

Figure 5A

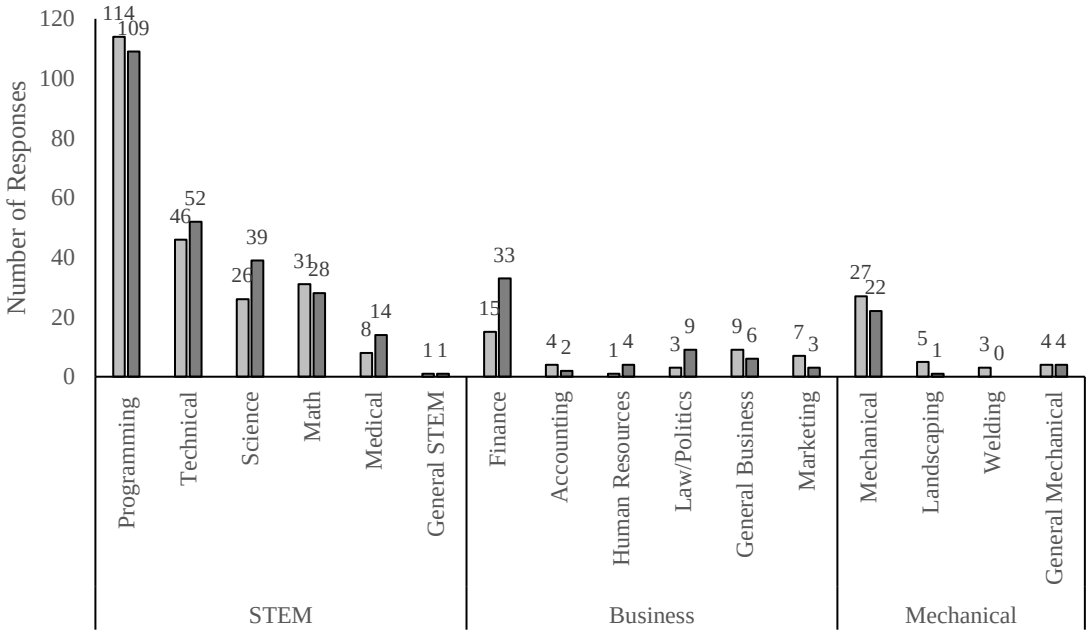
Social, Emotional, and Behavioral Skill Change Goals Narrower Categories



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.

Figure 6A

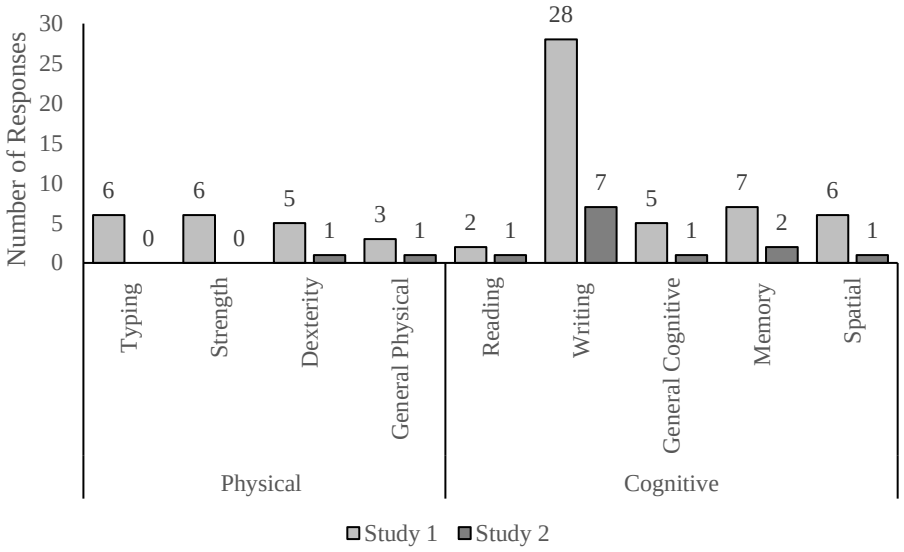
Knowledge and Technical Skill Change Goals Narrower Categories



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates. Foreign Language is also classified as a Knowledge and Technical Skill. For Sample 1, 46 people cited this as a skill change goal. For Sample 2, 5 people cited this as a skill change goal.

Figure 7A

Abilities Change Goals Narrower Categories



Note. N= 753 for Sample 1: Prolific. N= 667 for Sample 2: College Graduates.