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ORIGINAL ARTICLE

Development of Sustainable Work-styles for Individuals and Team Challenges (SWITCH) as a Tool for Measuring and Promoting Work Motivation; Theoretical Definition, Reliability, and Validity

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ABSTRACT

By working, people maintain their motivation to work and gain a sense of daily fulfillment and self-understanding. the aim of this study is to clarify how employees' interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles. The data from 1,693 subjects out of 1,946 were analyzed. Cronbach's coefficient was used for reliability verification. Content validity and construct validity were also used to verify the validity of the scale. Among the participants, 97.7% were women. As a result of the analysis, the reliability coefficient for the entire scale was 0.967. The structural equation models showed that the fit of the model is good with RMSEA of 0.067, GFI of 0.926, and CFI of 0.927. Regarding the indicator variables in the path diagram, the indicator for "Relationships with co-worker" had a moderate correlation with "Work environment". there was a weak causal relationship between "Personality", "Concept formation", "Interest", and "Motivation" in "Relationships with co-workers". Despite these weak causal relationships, the goodness of fit of the model in this study met the criterion value, indicating that it was conceptually valid. This research emphasizes evaluating how employee satisfaction is triggered and how it can lead to the achievement of work goals.

Keywords: Sustainable work-style for individuals and team challenge, work motivation, reliability, validity, structural equation models

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1. Introduction

Motivation in general comes from a wide range of personal or social factors, such as financial compensation, recognition by the colleagues or superiors, or satisfaction coming from personal achievements¹⁾. According to the 2014 public opinion survey on people's lives conducted by the Cabinet Office, when asked what the purpose of working was, 51.0% of respondents answered, "I work because I want money". 21.3% of respondents answered, "Work to find purpose in my life," and 14.7% answered, "I work to fulfill my duties as a member of society"²⁾. In addition, rewarding work serves as a precedent for individual self-actualization and organizational outcomes³⁾. It has been reported that the more specific and difficult the goal is, the higher the sense of accomplishment at work compared to situations where there is no goal or where the goal is abstract⁴⁾. Additionally, it has been reported that achieving the goals of a team increases the sense of accomplishment even more than when achieved as an individual and creates unity in the organization⁵⁾.

On the other hand, it has been reported that interest and motivation are significantly involved in the sense of accomplishment. It has been reported that Interest influence the direction, motivation, and persistence of goal-oriented behavior and that Interest may predict goal achievement in the workplace⁶⁾. Interest directs one's goals toward a specific area and causes one to maintain effort and persistence to achieve the goal⁷⁾. Motivation is the intensity of the desire to achieve a particular goal, regardless of how pleasant or unpleasant the experience of actually achieving it is. The motivational factor of reward, the feeling of "want", and the hedonic element of consuming it, the feeling of "liking", maintain remarkable evolutionary consistency in both human and animal brains^{6,8)}. However, it is not yet clear what triggers a person in a particular situation or with a specific goal to take action and how intense or frequent that action is. Basically, what motivates people is the degree to which they have control over others, external objects, and themselves, which is reported to be the amount of effective interaction⁹⁾. For some social psychologists and personality psychologists, motivation is related to mental expressions called goals, and goals are reported to generate activation and directional factors of motivation¹⁰⁾.

There are various theories about the factors that influence interest and motivation, but it is still unclear. From a developmental perspective, it has been reported that interest is caused by the interaction between individual characteristics, such as increased knowledge and positive emotions, and the learning situation and learning content. Furthermore, it has been reported that curiosity caused by Interest has a strong relationship with employees' intrinsic motivation towards work¹¹⁾. When employees view work as an enjoyable experience, they are more likely to engage in spontaneous and deep learning about the development of work-related knowledge¹²⁾. Conversely, Interest and motivation are important factors that influence an individual's exploration behavior and learning orientation¹³⁾. It has been reported that Interest and motivation are related to individual differences in employees' curiosity about work, goals and aspirations in life and cognitive style¹³⁾. Motivation is also known to be influenced by genetic factors, and it has been reported that the magnitude of genetic and environmental influences is also related to the direction of achievement goals¹⁴⁾. Although the influence of Interest in predicting educational and career choices, performance, and success has been reported, the mechanisms by which Interest influence these factors are not yet clear⁶⁾. Understanding cause and effect in the development of Interest stabilizes the early stages of life^{6,15)}. If it becomes clear how an individual's Interest and motivation are connected to the performance of their work, it is expected that this will lead to further self-awareness and growth in interpersonal relationships¹⁶⁾.

Motivation has been reported to be essential for employees' sustainable work styles, and many previous studies in the

fields of organizational behavior, management, and psychology have defined interest and motivation¹⁷⁾. Regarding the work motivation, it has been reported that work intensity, direction, and persistence are related. Persistence refers to how long a person continues to try so that they are motivated enough to work long enough to achieve their goals^{17,18)}. However, it has been reported that an individual's persistence is influenced not only by his or her personality but also by factors such as gender, age, income level, type of work, and organizational level^{19,20)}. Because of the importance of motivation, numerous theories have been developed but there is still no general evaluation method for motivational theories. Until now several scales have been developed to evaluate sustainable work styles using motivation, but most of them evaluate internal motivation or extrinsic motivation¹⁷⁾.

On the other hand, multidimensional motivation scales have been developed that assess autonomous motivation, which represents a combination of intrinsic motivation and controlled regulation, and external regulation, both material and social²¹⁾. However, none of these measures evaluates motivation for work by considering an individual's physical and mental condition, characteristics, and feelings acquired through experience and learning based on those characteristics. Throughout his or her life, they form unique concepts through interactions and experiences with other people. The formation of concepts begins in childhood and develops throughout life, taking in information through experiences of touch, smell, sight, hearing, and taste²²⁾. Motivation is related to learning experiences, which directly and indirectly influence outcomes²³⁻²⁵⁾. To date, no scale has been developed to evaluate work motivation that considers personal characteristics such as conceptual formation and personality. Therefore, the aim of this study is to clarify how employees' Interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles.

2. Methods

2.1. Participants

Participants were sales and manager staff of a sole proprietorship who had contact with company A in Japan. Of the data of 1,946 employees collected in this survey (response rate 94.0%), only data with no missing values which mean is data that completed all the answers to all items were extracted, and the data of 1,693 workers were included in statistical analysis. The study information provided on the first page of the questionnaire emphasized the participants had the right to pull out from the study at any time. All participants read the consent form and responded only if they agreed. All methods were implemented following the Declaration of Helsinki. The average time taken by patients to complete the questionnaire was approximately 30 minutes.

2.2. Reliability testing

Regarding the internal consistency reliability testing of the Sustainable Work-styles for Individuals and Team Challenges (SWITCH) questionnaire, Cronbach's alpha coefficient was carried out because the questionnaire's responses were dichotomous in nature. The reliability coefficient result was interpreted as follows: values ≤ 0 indicated no agreement, 0.01-0.20 as none to slight, 0.21-0.40 as fair, 0.41-0.60 as moderate, 0.61-0.80 as substantial, and 0.81-1.00 as almost perfect agreement²⁶⁾.

2.3. Content validity

To validate the content validity of the constructs, A few expert panels were invited to review the items regarding item content representativeness of the constructs, clarity, relevance, and format. A panel of experts being made up of two categories: professional experts ²⁷⁾. Six professional university experts involved with the expertise in Quality of Life, educational measurement, and scale development. All the professional experts consist of senior lecturers, lecturers, or researcher at the university.

2.4. Construct validity testing

Confirmatory factor analysis (CFA) was used to assess construct validity by evaluating the similarity of the dimensions and factor loadings between domains. CFA is a statistical technique used to verify the factor structure of a set of observed variables. There is a suggested approach to CFA proceeds through the following process: a) review the relevant theory and research literature to support model specification, b) specify a model, c) determine model identification, d) collect data, e) conduct preliminary descriptive statistical analysis, f) estimate parameters in the model, g) assess model fit, and h) present and interpret the results ²⁸⁾. Structural equation models (SEM) are the validation process, which is to test construct validity research because this is a marriage of regression, path analysis, and latent variable modeling (often called factor analysis) (Structural equation modeling and test validation). The goodness of fit of the SEM model was assessed by four types of fit indices: chi-square statistic, root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), and comparative fit index (CFI) in this study. The ratio of the chi-square statistic to the respective degrees of freedom (χ^2/df) is preferred. Generally, chi-square is used as an absolute fit index, with a low chi-square value relative to the degrees of freedom (and higher p-value) indicating better model fit ^{29,30)}. The RMSEA is less than 0.08, and other fit indices such as GFI and CFI are greater than 0.90 ³¹⁾.

2.5. Statistical analysis

The sample size calculation was based on Confirmation Factor Analysis, as we expected, and including at least more than 200 participants was accurate for models with moderate misspecifications by Monte Carlo study ³²⁾. Hoe (2008) and Singh et al. (2016) reported that minimum sample sizes in absolute sample size was any $n > 200$ offers adequate statistical power for data analysis ^{33,34)}. The data collected from the self-reported questionnaire was analyzed by structural equation modeling (SEM). The analyses were performed using SPSS 22.0 and AMOS 23.0 (IBM, NY, USA). All statistical tests were two-sided, and $p < 0.05$ was considered statistically significant. Continuous variables conforming to a normal distribution are shown as the mean and standard deviation, and those not conforming to a normal distribution are expressed as the median (Interquartile range). Categorical variables are expressed as the number of cases (Percentage).

3. Results

3.1. Draft of the questionnaire

Based on the previous research mentioned in the table 1 to table 7, we devised a theoretical hypothesis by which employees' Interest and motivation led to the achievement of goals in the workplace in this study (Figure 1). External stimuli such as music, movies, reading, sports, and information from others are the triggers that trigger his or her SWITCH. The way in which various stimuli are received differs depending on the individual's conceptual formation, which is

composed of visual, auditory, experience, language, and numbers, as well as their individuality, which consists of physical and mental health, attentiveness, and behavioral characteristics. These potential causes lead to people’s Interest involve emotional and cognitive aspects and motivation. The emotional dimension includes the experience of emotions such as enjoyment and excitement. The cognitive dimension includes the intellectual desire to acquire new knowledge. Emotional aspects can also lead to cognitive aspects. Interest and motivation lead to achieving goals at work. Motivation is also an essential driving force for accomplishing work tasks. However, motivational influencing factors are not only intrinsic but also external. It is the employee’s work environment and interpersonal relationships with co-workers. External factors can have an impact on intrinsic motivation and job performance (Figure 1).

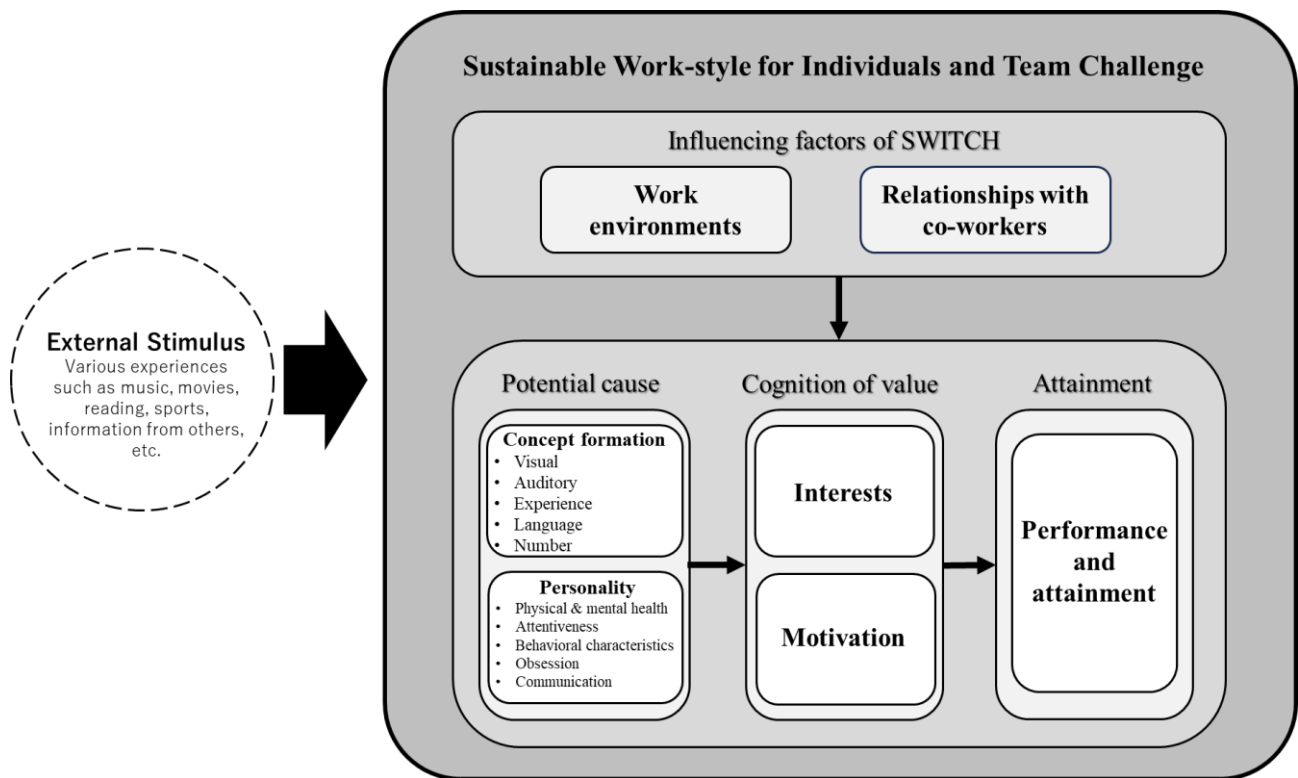


Figure 1. Theoretical hypothesis of SWITCH

3.2. Rational for all sub-domain of SWITCH

3.2.1. The sub-domain of “Work environment” and “Relationships with co-workers”

The International Classification of Functions, Disabilities and Health (ICF) classifies environmental factors related to an individual’s life functions into three categories: “Physical environment”, “Human attitudes”, and “Social institutions and services”³⁵). In this study, those three categories were defined as “Human resource maintenances”, “Materials resource maintenance”, and “Welfare benefits” as the sub-domain of “Work environments” (Table 1).

Table 1. Definitions, item examples and evidence for “Work environments” subdomain

Human resource maintenances	
Definition	Adjustments to personnel assignments, environmental settings, etc., made by the company for the purpose of ensuring that employees perform their work properly.
Items	<ul style="list-style-type: none"> • The work environment is conducive to consulting with a supervisor • The environment is conducive to communication with colleagues • Recruitment is being done properly <p style="text-align: right;">Total 6 items</p>
Evidence	<ul style="list-style-type: none"> • Masahide O. “The Quality of Working Life” studies: their present states, problems, and needed future directions. <i>Studies in sociology, psychology and education</i>, 1991, 33, 45-53. • Akada T. Nursery Teacher’s Stress Scale (NTSS): Reliability and Validity. <i>The Japanese Journal of Psychology</i>, 2010, 81(2), 158-166. • Manabe E et al. Correlation between Sense of Coherence and Satisfaction and Work Environment and Nursing Clinical Skills among Nurses at University Hospitals. <i>Journal of Japan Society of Nursing Research</i>, 2012, 35, 19-25. • Kulkarni P.P. A Literature Review on Training & Development and Quality of Work Life. <i>International Refereed Research Journal</i>, 2013, IV(2), 136-143.
Materials resources maintenances	
Definition	Adjustment of the physical environment of the workplace, such as lighting, air conditioning, sanitation, etc., by the company for the purpose of improving the work efficiency of employees.
Items	<ul style="list-style-type: none"> • Air conditioning environment can be regulated through the use of heating and cooling equipment, etc • The brightness of the room can be adjusted by utilizing indirect lighting, etc • Space for individual work, exists in the workplace <p style="text-align: right;">Total 5 items</p>
Evidence	<ul style="list-style-type: none"> • The Japan Institute for Labour Policy and Training (2012) Research on Job Structure: Numerical Analysis of Occupations and Study from Occupational Mobility (in Japanese). • Shoji T et al. A Study on the Task Performance on the Different Thermal Conditions. <i>Specific Research Reports of the National Institute of Industrial Safety</i>, 2003, 28, 49-61.
Welfare benefits	
Definition	Benefits provided by the company for the purpose of improving the economic and social conditions and lives of employees.
Items	<ul style="list-style-type: none"> • Services related to housing are provided • Services related to health and medical are provided • Services related to life support are provided <p style="text-align: right;">Total 6 items</p>
Evidence	<ul style="list-style-type: none"> • Ohta S. An Economic Approach to Corporate Benefits. <i>The Japanese Journal of Labour Studies</i>, 2007, 564, 20-31 (in Japanese). • Matsuda Y. Study on today’s changes in company’s employee welfare: On the basis of researches for Japanese companies. <i>The Journal of the Association of Economics Okayama Economic Review</i>, 2004, 36(3), 75-89 (in Japanese).

Regarding the sub-domain of “Relationships with co-worker”, we have established “Awareness of diversity” and “Building trusting relationships”. It has been reported that the negative impact on motivation is reduced because the employee’s sense of belonging is directed towards his/her organization³⁶⁾. A survey on nurses have shown that relationships in the workplace have a positive impact on emotional organizational commitments³⁷⁾. In the “Relationship with co-workers” in this study, it was predicted that improving human relations in the workplace would increase the sense of belonging to the organization and maintain motivation. Therefore, based on the subjectivity of the evaluator, “Awareness of diversity” and “Building trusting relationships” were set to evaluate the degree to which colleagues are involved in the workplace (Table 2).

Table 2. Definitions, item examples and evidence for “Relationships with co-workers” subdomain

Awareness of diversity	
Definition	Attitude of those who work together in the workplace toward diverse others with different experiences and backgrounds, trying to understand the differences in their opinions and positions.
Items	<ul style="list-style-type: none"> • Are the people around you trying to understand the situation from your perspective? • Are people around you trying to understand your feelings from your perspective? • Are people around you trying to understand different opinions? <p style="text-align: right;">Total 5 items</p>
Evidence	<ul style="list-style-type: none"> • Watanabe N. A Study of Mental Health in Work Organization Based on ERG Theory. Bulletin of the School of Education. The Department of Education Psychology, 1982, 29, 263-277. • Hiramatsu T. What the Business Communication is. Kumamoto Journal of Culture and Humanities, 2007, 95, 85-119. • Suzuki Y et al. Development of the Multidimensional Empathy Scale (MES): Focusing on the Distinction Between Self-and Other-Orientation. The Japanese Journal of Educational Psychology, 2008, 56(4), 487-497.
Building trusting relationships	
Definition	Attitudes of people who work together in the workplace toward the values of others.
Items	<ul style="list-style-type: none"> • Are people around you listening to what you are saying? • Do people around you relate to you in a way that makes you feel safe? • Do people around you respect your ideas? <p style="text-align: right;">Total 3 items</p>
Evidence	<ul style="list-style-type: none"> • Watanabe N. A Study of Mental Health in Work Organization Based on ERG Theory. Bulletin of the School of Education. The Department of Education Psychology, 1982, 29, 263-277. • Hiramatsu T. What the Business Communication is. Kumamoto Journal of Culture and Humanities, 2007, 95, 85-119. • Suzuki Y et al. Development of the Multidimensional Empathy Scale (MES): Focusing on the Distinction Between Self-and Other-Orientation. The Japanese Journal of Educational Psychology, 2008, 56(4), 487-497.

3.2.2. The sub-domain of “Concept formation” and “Personality”

As a result of the content validity, five sub-domains of “Concept formation” were established in this study: “Visual concept”, “Auditory concept”, “Physical concept”, “Verbal concept” and “Numerical concept”. People act and choose based on what they see, what they feel, and believe; meanings and values are part and parcel of our actions³⁸⁾. Concept formation begins in infancy, though their senses of touch, smell, sight, hearing, and taste children take in information. When infants look around their environment they gain a sense of size, weight, and shape. They learn that many things are heavier than they can lift through their experiences³⁹⁾. Early literacy and mathematical conceptual skills have a long-term impact on quality of life, and studies of adults have linked core abilities with employability and wages⁴⁰⁻⁴²⁾. Bryan et al. reports that the relatively small amount of age-related variance in verbal fluency suggests that verbal fluency performance is well maintained with increasing age. Moreover, initial letter fluency performance seems to rely more on participants’ verbal knowledge than on speed of processing, and excluded letter fluency performance seems to rely more on speed of processing than on verbal knowledge⁴³⁾. Therefore, we decided to evaluate the concepts related to vision and hearing, the concepts related to using the body, the concepts related to the quality and quantity of objects, and finally the concepts related to vocabulary (Table 3-1,2).

Table 3-1. Definitions, item examples and evidence for “Concept formation” subdomain

Visual concept	
Definition	The effects of visually related concepts such as color and shape perception on the work.
Items	<ul style="list-style-type: none"> • Can remember other people’s faces • Able to understand and respond to situations based on people's words, actions, and facial expressions • Able to act on information from maps, photos, illustrations, and other images <p style="text-align: right;">Total 10 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students’ Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Auditory concept	
Definition	The effects of Auditory-related Concepts, such as listening to sounds and noticing changes in sound, on the work.
Items	<ul style="list-style-type: none"> • Able to identify the direction of the sound • Able to hear the difference in intensity of sound • Able to hear the difference in tempo of sound <p style="text-align: right;">Total 8 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Experience concept	
Definition	The Effects of concepts related to touch, smell, posture, and movement on work.
Items	<ul style="list-style-type: none"> • Able to notice differences in hardness by touching things • Touching things to notice differences in weight • Able to notice differences in shape from the contours of objects touched <p style="text-align: right;">Total 11 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.

Table 3-2. Definitions, item examples and evidence for “Concept formation” subdomain

Language concept	
Definition	The effects of language-related concepts, such as the use of situational language and the accurate conveyance of information in words, on the job.
Items	<ul style="list-style-type: none"> • Understand people's relationships based on the content of their conversations • Able to describe in words the location of people and objects • Able to explain the time flow of things in words <p style="text-align: right;">Total 15 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant's Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Number concept	
Definition	The effects of mathematical thinking, processing of information, and other number-related concepts on the work.
Items	<ul style="list-style-type: none"> • Able to count and grasp the quantity and number of objects • Able to read the numbers as soon as they are seen • Able to quickly solve for numbers mentioned in conversation <p style="text-align: right;">Total 13 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant's Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.

In the “Personality” domain, five sub-domains were established: “Physical and mental health”, “Attentiveness”, “Behavioral characteristics”, “Obsession” and “Communication”. Personal factors play an essential part in effecting health problems and the impact of disability on inclusion in society. According to one report, which systematically categorizes personal factors based on the ICF, personal factors are classified by physical factors related to body function, mental factors related to psychological stability, emotional status, and openness to new experiences such as willingness to change, cognitive factors related to attention, behavior patterns, and social skills ⁴⁴). In addition, it has been reported that people potentially have two aspects, impulsiveness, and compulsiveness and that these aspects are independent but positively correlated with each other ⁴⁵). Personality characteristics also appear to have a significant impact on the problems of turnover and absenteeism in worker. The meta-analytic study report that personal traits do have an impact on individuals' turnover intentions and behaviors ^{46,47}). This study was set up to evaluate the characteristics of an individual's behavior, in addition to the health conditions necessary to continue working, so that motivation and its relationship to the environment could be assessed (Table 4).

Table 4. Definitions, item examples and evidence for “Personality” subdomain

Physical and mental health	
Definition	The effects of physical and mental health on work.
Items	<ul style="list-style-type: none"> • Feel sluggish and tired on a daily basis and have difficulty getting rid of fatigue • Feeling depressed or melancholy at times • Sometimes the little things make me angry and frustrated
Total 9 items	
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.
Attentiveness	
Definition	The effects of concentration and the environment for concentration on work.
Items	<ul style="list-style-type: none"> • Trying to concentrate on work, but sometimes distracted by ambient noise • Forgetting appointments or forgetting things • Sometimes lack of attention to detail or making simple mistakes
Total 7 items	
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.
Behavioral characteristics	
Definition	The effects of controlling one's own behavior and the environment on work.
Items	<ul style="list-style-type: none"> • Unable to sit still and fidget • In situations where you have to sit for long time, such as in a meeting, and feel the need to leave the seat • Sometimes when calm behavior is required, it is not possible to do so
Total 6 items	
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.

3.2.3. The sub-domain of “Interest” and “Motivation”

Motivational factors are intrinsically related to work. There are several reports that the overall success of the enterprise is affected by the performance of properly motivated employees. According to Hitka et al. (2021), An interest in the level of employee motivation and employee satisfaction is becoming of vital importance⁴⁸⁻⁵⁰. As a macro theory explaining human motivation, self-determination theory (SDT) has been widely applied to investigate individuals controlled and autonomous motivation at work. On the other hand, Feelings of interest are broad and are not restricted to feelings of curiosity, whereas feelings of curiosity are largely associated with the feelings of interest and may transition into feelings of interest. People’s exploration/examination behavior for specific information is depicted as a key factor that links feeling of curiosity and of interest. When knowledge exploration reaches its goal—the knowledge gaps have been satiated—positive emotion follows⁵¹. Curiosity has its root in human motivation and makes people seek out knowledge, meaningfulness, understanding and sense-making, and thus profoundly influences individuals’ self-regulation and the formation of cognitive capabilities⁵². Curiosity appears to be an indication of an employee’s job motivation⁵³.

Therefore, in this study, the domain of interest was set up in Social Cognitive Career Theory (SCCT) as a factor that leads to behavioral goals. It was set as a factor leading to motivation. Individual interest is defined as being caused by

deficient needs, and items were set up to assess needs for comfort, safety, and socialization (Table 5). Regarding the domain of “Motivation”, the factors of exploration, persistence, and enhancement were set as evaluation items as triggers for achieving sustainable work styles (Table 6). According to Maslow’s hierarchy of needs theory, when the basic human needs (physiological, safety, and group) are satisfied, the need for approval and self-actualization arise as higher-order needs. Exploration and persistence were evaluated as a means of self-actualization. And together with the evaluation of the need for approval, were set as evaluation domains of motivation.

Table 5. Definitions, item examples and evidence for “Interest” subdomain

Interest	
Definition	Interest and curiosity about external stimuli, places, and people.
Items	<ul style="list-style-type: none"> • Comfort of the working space is needed • Comfort for the wearer is needed • Want to know how reliable things are
Total 8 items	
Evidence	<ul style="list-style-type: none"> • Maslow A. <i>Motivation and Personality</i>. 1954. New York : Harper & Row. • Hane T. The Concept and Aspects of Comfort. <i>The Japanese Journal of Ergonomics</i>, 1993, 29(2), 49-57. • Murray HA et al. <i>Explorations in Personality (70th edn)</i>. 2007. Oxford: Oxford University Press.

Table 6. Definitions, item examples and evidence for “Motivation” subdomain

Motivation	
Definition	Motivation to try new things, to work persistently, to gain social recognition, etc.
Items	<ul style="list-style-type: none"> • Able to see difficult situations as an opportunity for personal growth • Have something that keeps it fun and keeps it going • Want to be admired by others
Total 9 items	
Evidence	<ul style="list-style-type: none"> • Maslow A. <i>Motivation and Personality</i>. 1954. New York : Harper & Row. • Shimazu A et al. Work engagement in Japan: Validation of the Japanese version of Utrecht Work Engagement Scale. <i>Applied Psychology: An International Review</i>, 2008, 57, 510-523. • Saito J et al. Development of the Values Clarification Questionnaire and Confirmation of Its Reliability and Validity. <i>Japanese Journal of Behavior Therapy</i>, 2017, 43(1), 15-26. • Kashdan TB et al. The five-dimensional curiosity scale: Capturing the bandwidth of curiosity and identifying four unique subgroups of curious people. <i>Journal of Research in Personality</i>, 2018, 73, 130-149.

3.2.4. The sub-domain of “Performance and attainment”

In this study, three subdomains were established in the “Performance and attainment” domain: “Effort”, “Achievement”, and “Social evaluation”. Intrinsically motivated employees work on tasks because in turn should accentuate their task-directed effort. Achievement strivings is associated with work performance through its influence on concentration⁵⁴⁾ and the rewards have a significant positive impact on employee performance⁵⁵⁾. As indicated in SCCT, the consequences of an individual’s actions become experiences when they are feedback and form a person’s cognition, including motivation⁵⁶⁾. Therefore, we assessed job accomplishment as a result of work behavior and social evaluation as its feedback (Table 7).

Table 7. Definitions, item examples and evidence for “Performance and attainment” subdomain

Effort	
Definition	Actions taken to achieve goals.
Items	<ul style="list-style-type: none"> • Specific goals were set to achieve the objectives • Communicated with others to achieve goals • Scheduling was done to achieve goals
	Total 4 items
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.
Achievement	
Definition	Subjective evaluation of the experience of achieving the objective.
Items	<ul style="list-style-type: none"> • The results were close to the goals set by myself • Communication with those around us led to results • Scheduling led to results
	Total 4 items
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.
Social evaluation	
Definition	Recognition and rewards from others for efforts and achievements.
Items	<ul style="list-style-type: none"> • The financial rewards were commensurate with the effort and achievement • Received deserved recognition for efforts and achievements from superiors • Received deserved recognition for efforts and achievements from colleagues
	Total 4 items
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.

The SWITCH is a self-report questionnaire consist of 143-item and 7-domain. Respondents use a 5-point Likert-type scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) to respond to the items. Of the 143 items, none were reversed. Participants assess how well each statement described their typical feelings toward themselves. Higher scores on the scale indicate higher levels of working sustainably.

3.2. Demographic Characteristics

Table 8 shows the demographic characteristics of the participants. Among the participants, 97.7% were women. In terms of age range, participants in their 40-49 years were the most common (33.0%). The participant with the lowest age range was the 80-89 years (0.2%). Regarding the occupation, sales staff was the most common (85.8%). The number of years of services was 8.2 years.

Table 8. Demographic characteristics of the participants

Sex, n (%)			
	Female	1654	(97.7)
	Male	31	(1.8)
	No answer	8	(0.5)
Age range, n (%)			
	20-29 years	217	(12.8)
	30-39 years	512	(30.2)
	40-49 years	559	(33.0)
	50-59 years	284	(16.8)
	60-69 years	78	(4.6)
	70-79 years	31	(1.8)
	80-89 years	4	(0.2)
	No answer	8	(0.5)
Occupation, n (%)			
	Sales staff	1452	(85.8)
	Management staff	169	(10.0)
	Other	41	(2.4)
	No answer	31	(1.8)
Years of service, mean (SD)		8.2	(8.8)

SD; standard deviation

3.3. Reliability

As a result of reliability using Cronbach's α coefficient, the reliability coefficient for the entire scale was 0.967. Regarding each domain, the reliability coefficients were 0.968 for concept formation, 0.911 for personality, 0.778 for interest, 0.837 for motivation, 0.915 for performance and attainment, 0.881 for work environment, and 0.926 for relationships with co-workers. Additionally, reliability coefficients greater than 0.700 were found in all subdomains.

Table 9. The results of reliability

Domains	Subdomains	Cronbach's alpha
Concept formation		.968
	Visual concept	.851
	Auditory concept	.874
	Experience concept	.866
	Language concept	.939
	Number concept	.934
Personality		.911
	Physical and mental health	.823
	Attentiveness	.808
	Behavioral characteristics	.834
	Obsession	.766
	Communication	.729
Interest		.778
Motivation		.837
Performance and attainment		.915
	Effort	.884
	Achievement	.880
	Social evaluation	.838
Work environments		.881
	Human resource maintenances	.890
	Materials resource maintenances	.810
	Welfare benefits	.828
Relationships with co-workers		.926
	Awareness of diversity	.893
	Building trusting relationships	.915
Total		.967

4. Construct validity

As a result of analysis using structural equation modeling, the model in Figure 2 showed the best fit of each index. The SEM showed that the fit of the model is good with RMSEA of 0.067, GFI of 0.926, and CFI of 0.927. On the other hand, the chi-square value is 8.486. The SEM analysis revealed the relationship between each domain. A very strong and positive relationship was found between "Concept formation" and "Visual concept" (path coefficient = 0.79, $p < 0.001$), "Auditory concept" (path coefficient = 0.83, $p < 0.001$), "Experience concept" (path coefficient = 0.78, $p < 0.001$), "Language concept" (path coefficient = 0.85, $p < 0.001$), and "Number concept" (path coefficient = 0.74, $p < 0.001$). There are moderate and positive relationship found between "Relationship with co-worker" and "Personality" (path coefficient = 0.40, $p < 0.001$). However, the "Personality" was very strong and positive relationship with "Concept formation" (path coefficient = 0.84, p

< 0.001). Regarding the “Relationship with co-worker”, not only “Awareness of diversity” but also “Building trusting relationship” was very strongly correlated (path coefficient = 0.86 and 0.84, all of $p < 0.001$). However, the “Concept formation” was weak correlated with “Relationship with co-worker” (path coefficient = 0.29, $p < 0.001$). Regarding the “Personality”, not only “Attentiveness” but also “Communication” was strong correlated (path coefficient = 0.78 and 0.77, all of $p < 0.001$) while “Physical and mental health”, “Behavioral characteristics” and “Obsession” was moderately correlated (path coefficient = 0.56, 0.67 and 0.57, all of $p < 0.001$) (Figure 2).

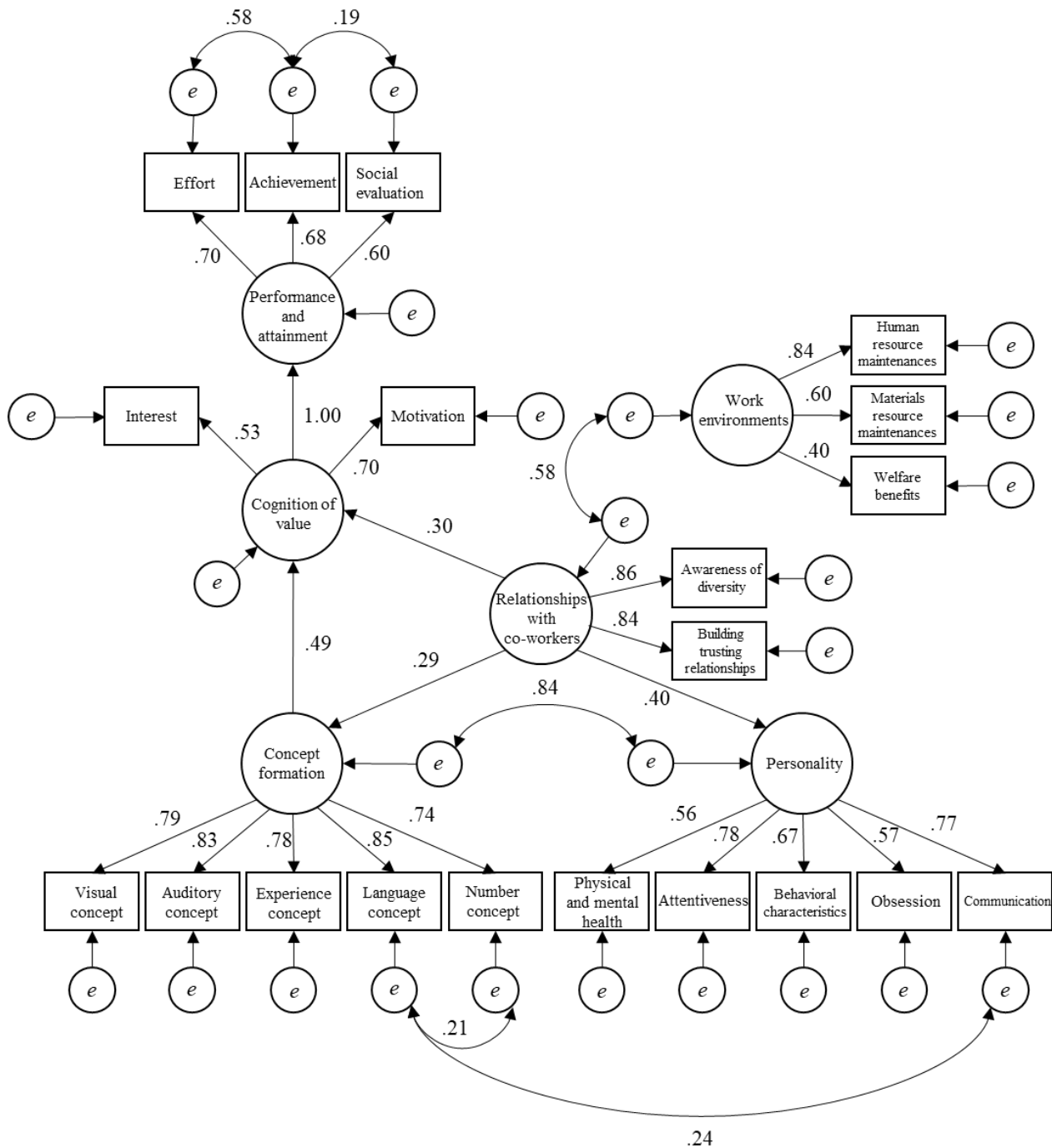


Figure 2. The results of construct validity

5. Discussions

This study aims to clarify how employees' Interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles. The SWITCH questionnaire to collect the data on sales and management staff mainly. When the reliability of the path diagram created based on the theoretical background was verified, the Cronbach alpha coefficient was more than 0.9 overall, and more than 0.7 in all domains. In addition, in the verification of the construct validity, all indicators of RMSEA, CFI and GFI met the goodness-of-fit criteria, and the its validity as an evaluation scale was verified.

In this study, regarding the indicator variables in the path diagram, the indicator for “Relationships with co-worker” had a moderate correlation with “Work environment”. The work environment supports individuals' career growth, learning, and development, and colleagues and supervisors are reported to be the primary sources of development assistance and support for individuals⁵⁷⁾. According to Shahidan et al. also reported that peer relationships promote a healthy and positive work environment that can contribute to a healthy life in the social community⁵⁸⁾. Our study found a relationship between interpersonal relationships with co-workers and the work environment, a result consistent with these previous studies^{57,58)}. Relationships with co-workers will help to understand the characteristics of individual employees and meet their work style needs, and they will also enable positive feedback by allowing appropriate evaluation of work accomplishments³⁷⁾. The SWITCH-based evaluation will provide clues for understanding and improving the state of the environment and human relations within the organization.

On the other hand, there was a weak causal relationship between “Personality”, “Concept formation”, “Interest”, and “Motivation” in “Relationships with co-workers”. Relationships with non-formal colleagues in the workplace are reported to be important for supporting career development and sharing the organizational and job-related knowledge needed to perform tasks⁵⁹⁾. It has been reported that team performance is higher than individual performance in jobs that require a wider range of knowledge, judgment, and opinions⁶⁰⁾. This is thought to be because cooperation and teamwork with colleagues are given priority over showing off one's individuality. In addition, regarding the relationship between “Relationships with co-workers” and “Interest” and “Motivation”, it cannot be said that “Interest” and “Motivation” is necessarily related to interactions with others in this study. The phenomenon of intrinsic motivation was first recognized in experimental studies of animal behavior, where many organisms exhibit exploratory, playful, and curious behavior on their own, even in the absence of reinforcement or reward relationships^{61,62)}. In addition, it is said that humans naturally simply enjoy activities that have worked well in the past and tend to continue those actions for their own sake⁶³⁾. Intrinsic motivation and the resulting behavior may not necessarily be caused by relationships with others. However, despite the weak causal relationships between these domains and “Relationship with co-worker”, the goodness of fit of the model in this study met the criterion value, indicating that it was conceptually valid. Moreover, most of the subjects of this study are sales staff who are self-employed and have a unique work environment as they are free to decide their working hours.

Another interesting thing is that moderate or higher causal relationships were observed between “Concept formation”, “Personality”, “Interests”, and “Motivation”, and very strong correlations were observed between concept formation and personality in particular. Through this scale, it is possible to understand the status of an individual's past learning experience and to understand how an individual's aptitude matches the job, regardless of the specific organization or job type. This can also be expected to be used to consider the training necessary to improve an individual's career. In conclusion, the SWITCH can be used in a valid and reliable way so as to determine the sustainable work styles for employees, including

sales staff and manager staff, by clarifying how their interests and motivations lead to achieving their goals. In order for a scale to be of high quality and beneficial, it should be used in various research attempts and for different samples on different occasions, and validity and reliability investigations should be conducted.

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