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Examination of a personality factor which influences the individual differences in athletic burnout

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The purpose of this study is to understand the effect of the melancholic type of personality (in German *Typus Melancholicus*; TM) on the dynamics which causes athletic burnout through the examination of the hypothesis stating that the types of stressors which relate to the burnout symptom are different depending on whether athletes have TM or not. For the purpose, we carried out a questionnaire investigation involving 960 (604 male, 356 female) Japanese college athletes in 2006 and 2007. The questionnaire was composed of a Depression-Related Personality Scale (DRP), a Daily and Competitive Stressor Scale (DCSS), and an Athletic Burnout Questionnaire. In the analysis, we elucidated TM and non-TM groups based on DRP scores and compared the values of the DCSS-ABQ correlations between the two groups. The results supported our hypothesis. Furthermore, this study led to a new finding beyond our hypothesis: the feature of the stress-burnout relation is also different, depending on whether the athletes have the personality traits of “perfection in work (PW) and/or “devotion to others (DO)”, derived from TM. Therefore, it can be said that the relations between stressors and burnout differ among the different personality traits based on TM.

The relationship between achievement motivation and achievement behavior among Japanese university athletes: an approach using goal orientation theory

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The purpose of this study is to examine whether dispositional goal orientation (task orientation and ego orientation) has effects on the relationship between achievement motivation and achievement behavior among highly competitive university athletes in Japan. In 2007, 168 highly competitive track and field athletes from Japanese universities completed a questionnaire composed of a Task and Ego Orientation in Sport Questionnaire (TEOSQ), an achievement motivation scale and an achievement behavior scale. For the analysis, the subjects were classified into 4 groups (high orientation, task orientation, ego orientation and low orientation) on the basis of z-scores of task and ego orientation. Two-way factorial ANOVA was chosen to examine the effect of goal orientation on achieve-

ment motivation and achievement behavior. Moreover, correlation analysis was carried out to examine the relationship between achievement motivation and achievement behavior among the above-mentioned 4 groups. The results show significant main effects of task and ego orientation on some factors of achievement motivation. There were no significant main effects of task and ego orientation on achievement behavior. Moreover, the results of correlation analysis showed different significant correlations between achievement motivation and achievement behavior in each group. Therefore, it is valid to consider that goal orientation is one of the psychological factors that have effects on the relationship between achievement motivation and achievement behavior among highly competitive university athletes in Japan.

A human ergological approach to career transition for professional athletes

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As competitive as the labor market of the Japanese companies can be, all too often employees are given a variety of working styles. However, what if, in order to stand a better chance of gaining competitiveness, the appearance of a new working style and career change were boosted? This study proposes a new concept in the career transition of professional athletes from the perspective of human ergology and physical education as a booster to Japanese society, in order to help solving the problem of second career issues. Traditionally, many professional athletes in Japan have been forced to retire at a relatively younger age each year. It is now more important than ever to reconsider the issues of their second career and their working styles as social role models. In general, research concerning career transition has been conducted in the fields of business management, sociology and psychology, and only recently in physical education. Human ergology is aimed at applying the acquired knowledge to our actual living in order to improve the human well-being and the quality of daily work and life. That is to say, both physical/biological functions and mental/psychological functions should be considered in the context of human ergology to deal with career transition in the case of professional athletes. In conclusion, the proximity characteristics of human ergology and physical education are important viewpoints.

Considerations on recycling in universities

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The *Containers and Packaging Recycling Law* has been enforced in 2000, and the recycle business is advancing in various fields in Japan. In the field of plastic recycling, there is an excellent method that consists of returning plastic into plastics raw material (pellets), which can be reused many times. However, it is necessary to improve collection methods and to increase the citizens' awareness regarding recycling. There are many types of containers that can be recycled. Among these, the food containers produced by Yokota Tohoku (the so-called "ReRePacks") are selected and transformed into pellets by people with disabilities at a vocational aid center. Thus, the recycling of the "ReRePack" food containers leads to better payments at the work place and helps protect the environment. Presently, the collection rate is not very high even though these packs are used as lunch containers at Takasaki City University of Economics. I conducted a questionnaire survey on December 10, 2007 during the "Interpersonal relationship theory" lesson, in order to grasp the users' state of mind regarding recycling. The respondents were 270 persons (174 men and 96 women). The

survey showed that people who throw away the used containers are those who do not know the mechanism of recycling. I suggest that people's awareness regarding the recycling process should be increased, by flyers or public activities, in order to raise the collection rate. Also, more efficient collection bins for recyclable waste can be created by paying attention to people's behavior.

Standing exercise machine for spinal injuries

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A machine for maintaining the standing position and for walking exercise (involving dorsi- and plantar flexion of the foot joint) has been developed for the treatment of spinal injuries. This machine is moved by the user's legs or arms. Leg volume is compared during standing and walking exercise. The leg volume decreases during exercise compared to the standing time. We consider that the walking exercise helps decrease the blood accumulated in the leg during passive exercise such as standing.

Age-related static traction force and dynamic characteristics of starting grass mower

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The rate of elderly persons is high in Japan and many elderly engage in agriculture in the rural areas. Because of the narrow rice fields and the slopes on which fields are commonly cultivated in the rural areas (the so called *satoyama*), farmers cannot use large-scale agricultural machineries. In addition, when a farmer becomes old, he becomes unable to properly handle agricultural machineries, even of small size. It is necessary to develop agricultural machineries that are safe, light, and easy to manipulate in order to solve this problem. In this paper, the change of traction force due to aging was measured, and the dynamic characteristics of two types of grass mower (a normal and a power-assisted type) when the engine is started were measured. The average of traction force in women was of about 18kg for under 65-year-old subjects, and of about 15kg for subjects over 65 years old. These values also correspond to 60% of men. Two peaks of force were observed when starting the grass mower engine. The maximum force in the power-assisted type corresponds to that of about 50% of the force required in the normal type. Importantly, power-assisted grass mower engines were easily started by women having 15kg or less of traction force.

A new tool for caregivers assisting toilet use

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The purpose of this study is to make a new tool for caregivers to decrease their muscular load when assisting those in need of care to use the toilet. We planned to analyze the series of movements during toilet assistance, in order to estimate each load and try to make a new device. In this paper we present our tentative results. The characteristics of caregiving during toilet use, from the caregiver's viewpoint, are as follows: Aging brings decrease of muscular strength in all people. That is, the problem of toilet care is everyone's problem; The frequency of toilet use increases in older people, espe-

cially at night; Toilet use is a very private matter. For this reason, the care during toilet use becomes a mental load not only for the patient, but also for the caregiver; Relieving nature near the bedside is a trigger to remain permanently bedridden. Smooth toilet use is the key to avoid it and to keep the quality of life. The characteristics of this study are the adoption of the caregiver's standpoint and the aim to decrease the need of care giving, which has not been so frequently and intensively considered until now. Within our experiment, we set the conditions of simulating toilet behavior as follows to estimate the caregiver's load and to link it to the invention of a new device or tool: The subject is assumed to have a right side paralysis and a total decrease of fitness (with aphasia and injury of the brain); The caregiver stands by the patient's paralyzed side; The environment is the toilet with enough space for care giving activities. The series of movements is as follows: stand up from the bed - walk - (door opened by the caregiver) - undress - sit on the toilet - relieve nature - stand up - dress back - (door opened by the caregiver) - walk - sit. These are tentative results and the study is to be continued.

Examining working memory and mental models in the elderly

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Several tasks were performed in order to examine the working memory and mental models of the elderly. The tasks are as follows.

- (1) When a white button is pushed, a number of coins appear on a plate based on the number of times the button is pushed. So, when pushing twice, two coins appear on the plate.
- (2) When a black button is pushed, the coins on the plate are moved into a black box.
- (3) When the black button is pushed twice, the coins in the black box are moved into the plate.

After elderly participants were given time to memorize the above-mentioned rules, they were asked five questions, such as "Tell the number of coins in the black box when the white button is pushed twice and the black button is pushed once". After finishing all tasks, the participants were asked the rules. As the next task, the participants were asked to adjust time, as indicated by the tester, after being taught how to operate a digital clock. As results of the experiment, the following aspects became clear: simple structures, short time operations and visualization of the operation flow are needed in order to easily construct a mental model and to decrease the load on working memory.

Suggestion for a Structured Task Analysis Method

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The inspection method is used well as a usability evaluation. However, the result of the inspection method currently used is verbal data that cannot be analyzed. Therefore, we suggest a new method to obtain quantitative data which we will call Structured Task Analysis. This method is based on 3P Task Analysis. In this method, the analyst uses a 4x4 matrix by every subtask. This matrix is formed of 16 cells, horizontal items are operating steps and vertical items are points of usability evaluation. Operating steps are "setting the goal", "action specification", "execution", "evaluation", and they are based on the 7-step model of human-machine interaction (D. A. Norman, 1986). The points of usability evaluation are "consistency", "simplicity", "universality", "support", which are based on 10 questions of the System Usability Scale. The result of this method is a matrix in which every cell has binary data (1 or 0), so that the analyst can analyze the result with various statistical methods, such as correspondence analysis, cluster analysis, formal concept analysis, etc.

Working postures of office equipment maintenance persons

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In recent times, the services industry has become very popular and maintenance work has become essential. In this paper we present an analysis of the work done by maintenance personnel. The purpose of this study is to point out the features and problems of maintenance work. We videotaped the posture of a serviceman working on a photocopier and extracted his work posture at each 1-minute interval. The work postures were classified into several categories. Among all types, the kneeling posture appears most frequently. To investigate which body part was most used, we used an abridgement data method with the help of Boolean algebra and Formal Concept analysis. The result showed that one arm and the trunk were the most important body parts. We were able to point out the features and problems of maintenance work, and we found a new perspective of analysis through data abridgement in Boolean algebra and Formal Concept analysis.

Ergological accident analysis on crossing collisions using image-recording-type drive recorders: Evaluation of visibility at urban intersections for preventive safety

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In Japan, a quarter-million crossing collisions are accounting for one-fourth of the total accidents and more than half of them occurred at urban uncontrolled intersections. Our previous studies revealed that their risks depended on the quality of visual environment at intersections and 80% of right/left-ward ranges of view were insufficient. Therefore, this study aims to clarify the actual process of crossing collisions and the effects of visual environment on these. Ergological accident analysis dealing with 10,572 events recorded by drive recorders installed in 200 taxicabs revealed that the distribution of types and frequency of near accidents (1,452 cases, 13.5%) and accidents (22 cases, 0.2%); rear-end collision (28.4%), crossing collision (19.4%) etc. was reflecting the macro statistical data of nationwide road accidents reported by the National Police Agency. Furthermore, 76% of near accidents and crossing collisions occurred at intersections and 42% at uncontrolled intersections without corner cutoffs or convex traffic mirrors. A case study confirmed clearly the effects of corner cutoff for drivers to mutually detect crossing vehicles at an early timing and to avoid crossing collisions. In conclusion, accidents are tightly associated with the quality of the visual environment, and the visibility improvement by corner cutoff should be given a high priority. Minimum requirements for intersection visibility are proposed to prevent crossing collisions at urban intersection.

A study on skill transfer and education in the non-ferrous metal casting manufacturing

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This study is aimed to clarify the detrimental factors of the present situation on skill transfer and

education in the non-ferrous metal casting manufacture. Skilled workers' ability was grasped to implement skill education smoothly and to develop a system redesign. In the foundry investigated, workers aged over fifty-five years old accounted for 3/4 of the total. We measured the working environment (temperature, humidity, and noise) and the work loads (working hours and work posture), and the aged workers' and young workers' skill levels were confirmed. As results, this investigation has revealed four problems regarding the skill transfer and education: (1) skilled workers showed high fatigue; (2) it is difficult to get on-the-job training due to work environment problems; (3) skilled workers are reluctant to teaching young workers because of their artisan spirit; and (4) it is necessary to secure skilled aged workers. In the system redesign, the following three measures were taken in order to implement skill education smoothly: (1) reduction of acquisition levels by work improvement; (2) grasp of skill levels by skill management; and (3) improvement of the working environment to educate smoothly. Thus, skill education became easy to do by using KAIZEN. However, the skilled workers' load was increased because of the improvement of communication skills and the change in motivation. Therefore, all employees should make efforts to respect the aged workers' skills and to build a better working relationship. Also, it is necessary to work out the difference of opinions between skilled workers and young workers.

Japan-Indonesia Joint Workshops on Lesson Study

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We have held annual Japan-Indonesia Joint Workshops on Lesson Study supported by the Ministry of Education in Indonesia since 2004. The purpose of these Joint Workshops was to discuss effective professional development through lesson study. The first Workshop was held in Bandung, the second in Surabaya, the third in Padang, and the fourth in Solo. An arithmetic lesson and an adapted physical education lesson were conducted once by Japanese teachers and once by Indonesian teachers, and joint Japan-Indonesia lessons in arithmetic and adapted physical education were also held once each. Participants consisting of teachers, school masters, university lecturers, university students, and parents, observed these classroom lessons. After each classroom lesson, they discussed what they had just observed at a participatory review meeting. The school masters' group in Padang at the meeting recognized the lesson study as a good model easily adjustable according to the Indonesian school culture. In each questionnaire survey undertaken in the four cities, more than 90% of the respondents answered that the lesson study was effective in improving the quality of the teachers working in schools for children with intellectual disabilities. It is hoped that the advantages of the lesson study will be widely recognized in the special schools throughout Indonesia.

To what extent do girls have opportunities to come in contact with babies?

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Presently, opportunities to train girls to become good mothers in our society have remarkably decreased because of the following reasons; 1) The number of families having children is decreasing. 2) Children do not have many siblings. As a result, girls feel uneasy about having babies and becoming mothers in the future. Accordingly, we sent out questionnaires to investigate this tendency in detail. The question was, specifically, "How many opportunities to come in contact with babies have you had so far?" This was sent to 487 students in the 1st year at Japan Women's College of Physical

Education. The questions (Q1-Q3) and answers (rates) were as follows: Q1CP(A) Persons that have the opportunity to come in daily contact with a baby aged up to 1 month: 13.6%. (B) Persons that have had no chance to hold a baby aged up to 1 month: 29.8%. Q2 (A) Persons that have the opportunity to come in daily contact with a baby aged between 2-12 months: 17.9%. (B) Persons that have had no chance to hold a baby aged between 2-12 months: 13.1%. Q3 (A) Persons that have the opportunity to come in daily contact with a child aged between 2-5 years: 22.6%. (B) Persons that have had no chance to come in contact with a child aged between 2-5 years: 4.9%. These rates show that more girls have opportunities to come in contact with infants when the infants get older. We also sent out the following questionnaire: "What did you feel about this video?" to the subjects after having asked them to watch a video showing the growth of infants, between the age of 1 month and 28 months. After that, we noted their feedback and analyzed information from the report of their impressions. The most frequent reactions were: "They are cute", "I am very impressed". It is likely that this experiment stimulated them to have tender feelings towards child care.

Developing a School Support System for the Adaptation of Elementary and Junior High School Students to the School Scene

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In the educational scene of Japanese schools, developing a therapeutic and educational way of supporting students with slight developmental disorders and a support system are an imperative. The purpose of this study is to develop a school support system to promote adaptation for adolescent students to the school scene, with the help of university students who aim to become school teachers. In order to achieve this, we organized orientations for university students as school supporters, constant meetings with elementary and junior high school teachers and we developed a prototype school support system. Next, we examined the developed school support system. Moreover, considering the precedent study proving that group activity with physical exercise and sports has positive effects on self-efficacy, a peer support program containing the above-mentioned exercises was carried out. In conclusion, these practices were significantly meaningful because the developed school support system supported not only the school scene which is facing with a lot of educational problems, but also motivated university students willing to become school teachers to learn more, and created an opportunity for them to experience a way of dealing with students with non-adaptive behavior ahead of time.

The origin and maintenance mechanism of high percentage in right-handedness

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Handedness is generally defined as which hand is used for more precise movement. Footedness and other dominances are also recognized as almost the same. However, in the case of cutting with scissors, the skilled hand holds the scissors while the other hand holds the object tightly, meaning that the other hand also has a function. Therefore, handedness might be recognized as the differentiation of hands or the division of labor in hands. Handedness is intrinsic based on the differentiation of

brain hemispheres (for example, the speech center is localized in left hemisphere). However, the environment including the cultural set that surrounds the person affects his/her handedness of humans, which is extrinsic. This is the problem of handedness in an individual. A characteristic of handedness is the ratio between right-handed and left-handed persons; the ratio of right-handed individuals in a population is almost 90 %, with variations between sexes, races or generations. Why has right-handedness become dominant (more frequent)? We do not have an exact scientific answer for that, but we do have some indications that might help the explanation. We introduced these indications here. There are several hand print figures left on cave walls, dated in the upper-Paleolithic, ca. 30-10 thousand years ago. They show the dominance of right-handedness then, the percentage of right-handedness being estimated at about 90%. Many researches show almost the same rate in recent populations, which means that the phenomenon is conservative. The characteristic is considered to be related to the origin of Hominids, because other primates never show it. Billard, Faurie and Raymond (2005) have proposed the maintenance mechanism, using the factors of the frequency and advantage of left-handedness and right-handedness. They also proposed that the existence of left-handedness is kept in balance between its disadvantage and advantage based on its scarcity.

Hand dominance in anthropoids

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The data on hand dominance in anthropoid apes is useful for the study of the development and functional differentiation of the human central nervous system. Until now, some studies on the dominant hand in chimpanzees and gorillas have often called attention, but they provide only data from a restricted group of animals. The problems of hand dominance in anthropoids have not been sufficiently investigated. In this study, the frequency of use of the dominant hand in orangutans was examined. About 300 pictures of orangutans were collected from the Internet and 112 examples, which showed different postures and positioning of the right and left hands, were chosen to be analyzed. One orangutan using a stick as a tool was right-handed. Another one, which held a bottle in the left hand, and peeled off the label with the right hand, was judged as right-handed. Among the 69 examples where animals were using their hands to eat and carry or hold twigs, 48% showed right-hand dominance. Matsumura (2007) determined that 49% of 69 chimpanzees and 72% of 68 gorillas were right-hand dominant by using the same method as in the present study. The rate of right-handedness obtained in orangutans showed a similar tendency to that of chimpanzees although smaller than that of gorillas. Gorillas spend more time in terrestrial environment taking a sitting position with the trunk erect and both hands free than chimpanzees or orangutans do. Humans, terrestrial bipedal walkers with erect trunks and both hands free show a 90% right-hand dominance. Such posture feature and positional behavior in the terrestrial environment may have generated the hand dominance. Further understanding of the functional difference between right and left hand and the role of the dominant hand is expected by analyzing behavior directly observed in the field and at the zoo, in addition to the picture data.

Revisiting ISO6385: 2004 and other STDs, and their implementation

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In the past two decades, a corporate recruiting scheme has offered more jobs with limited term employment than jobs with an unlimited term. The limited term system helped increase the degree of freedom for employees to choose a job matching their working style, but it also brought unfair payment and unequal treatment between the two. To resolve part of these problems, this study revisited the ISO ergonomics principles for solutions that could satisfy both employers and employees. As a result, the present study re-learned the following important points: 1) the standard users include the manager, workers, and professionals; 2) the 17 terms and definitions are useful for the basis of good communication; 3) the content of “designing work systems” is essential for the people participating in a work system; 4) it is stated to optimize the performance and effectiveness of the work system by an “evaluation of the design of a work system”. These points, along with others, contribute to the managers’ and workers’ well-being. An effective implementation of these standards, however, requires further efforts to prepare installation manuals and the like, so that everybody participating in the designing can communicate thoroughly. Otherwise, the standards are hardly applied for the improvement of the work system. They should be made available for public use.

Common features of the methods to facilitate participatory low-cost improvements in small-scale workplaces

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Recent reports on participatory low-cost improvement programs in small-scale workplaces are reviewed to know the common features of practical methods to facilitate these improvements. The review covers (i) participatory action-oriented training programs in small workplaces in manufacturing, health care and services for reducing health risks, (ii) WISE (work improvement in small enterprises) courses in small enterprises and (iii) WIND (work improvement in neighbourhood development) workshops for farmers. These training programs are widely conducted in Japan and other countries in Asia. Trainers in the reviewed programs commonly act as facilitators who play multiple roles in helping managers, workers and farmers take initiative and achieve immediate improvements. Trainers help participants take subsequent group work steps of setting goals, proposing practicable improvements and implementing selected improvements. In each of these steps, trainers rely on action-oriented methods using group work tools, including action checklists and low-cost action guides. The participatory steps are more successfully facilitated when the trainers support (a) collection and presentation of local good practices, (b) focusing on multiple low-cost improvements reflecting basic principles of ergonomics and occupational hygiene, and (c) stepwise progress in accordance with local conditions. This can lead to concrete results that have real impacts on reducing health risks. The locally adjusted design of these tools is the crucial factor common in the observed participatory steps. It is of particular interest that the emphasis placed on local good practices can facilitate this design. The use of locally adjusted training tools aimed at stepwise progress is recommended as a practical means of facilitating group dynamics towards effectively achieving improvements at small workplaces.

Survey on the determinants of mental health in child care institution workers

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It is well known that symptoms of job burnout are prevalent in the care staff working in child welfare institutions. Job burnout has been described as the inability to cope with emotional stress at work or as the excessive use of energy and resources leading to feelings of failure and exhaustion. It is supposed that child welfare institutions are a highly stressful work environment. Therefore, this study was conducted to clarify the determinants of mental health in the care staff working in child welfare institutions, using a self-rating questionnaire (Brief Job Stress Questionnaire). The questionnaire, which was developed to assess stress and job-related stressors consisted of 57 questions concerning psychological stress, physical stress, and social support. The subjects were 138 persons in total, aged 20-50, who worked in child welfare institutions. The study found that the psychological stress was significantly correlated with physical stress. The factors significantly associated with psychological stress were low job suitability, high job demand, and being dissatisfied with their life, according to multiple regression analysis. The factors significantly associated with physical stress were high physical work load, low job skill, high job demand, being dissatisfied with their life.

A study on the development of simple questionnaires on care worker's preferences and feeling of workload

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The purpose of this study is to develop simple questionnaires to clarify 1) how the work situation influences the feeling of workload and the care workers' weakness, by grasping their work preferences, and 2) how the situation or the workers' background experience and skills can ease the workload and weakness in order to eliminate the workers' stress. The results could indicate checkpoints to create a comfortable working environment, or for the practical activity of KAIZEN. A psychological method named SDM (Sensitive Differentiation Method, variation of Semantic Differential Method) was mainly used in this study. As a result, this original research collected 309 free keywords regarding preference of care work from 26 workers, through the interview approach, and categorized them to make testing questionnaires (comprising 8 categories: 1. experience, 2. frequency, 3. difficulty, 4. mental workload, 5. physical workload, 6. worthwhile, 7. variation, 8. special feeling of load on body parts). In the testing research, 26 respondents were collected and some similarities were recognized by using correspondence analysis. At last, cluster analysis extracted 8 categories for simple questionnaire elements as follows: 1. physical workload, 2. communication conditions, 3. simplicity and complexity, 4. time length, 5. existence of risk (risky condition), 6. amount of skills, 7. worthwhile and satisfaction, 8. variation of work formation. In the future, a practical test using the newly categorized elements will need to be verified.