Education, research activities and life experience: the course of my 45 years

Junko Kataoka

Japan Women’s College of Physical Education

As an introduction and an example of how a person’s life can relate to a symposium on “women in work, in society and in life activities”, I will present a brief overview of my 45 years of involvement in education and research from 1964 to 2009 is presented. Professionally, my life consists of academic research, writing and publication, presentations at conferences, and educational and teaching activities at the university. At the same time, I have spent considerable time with my family, raising three children, looking after my aging parents-in-law, nursing them as they grew older and sadly passed away, looking after my husband as he and I grew older, and dealing constantly with all these changes in my life. These responsibilities are not unfamiliar to us or uncommon in society today, and each of them is too heavy a burden for women. Nowadays, many women are expected to be promoted to an important position in fields such as politics, business, and science. However, Japanese society is not yet fully developed for women to work professionally as they are also held responsible for their married and family life, such as taking care of children and older people. For example, the number of Diet women in the House of Representatives and Councilors is forty four. Japan ranks only 133 out of 187 countries in this matter, according to the newspaper Nikkei, 14 May 2009. This result shows that women’s activities and position in Japan are lagging behind when compared to other countries and that women’s opinions and activities are not always welcomed in contemporary Japanese society because of our traditional culture and beliefs. In Japan, even today, talking about hardships like domestic chores, child care and nursing is regarded as a weakness in a professional context. It is better not to mention them. Women have to continue to work with these so-called weaknesses or resign from their jobs. Social changes must take place so that these responsibilities fall not on the individual, but on society as a whole. Child care and nursing care for old people need to be more available. It seems that we need social reforms to change our collective awareness of these problems. My last 45 years are the story of the past, but women today still have the same problems. We need to find a remedy, a solution to these social problems. At this dynamic conference, we have to examine ways not to limit or dilute women’s professional abilities, talent, and the energy in a broad outlook from various angles, and encourage their very valuable professional contributions.
Professionalism and American women: Elizabeth Blackwell (1821-1910) and succeeding female doctors

Junko Araki
Aoyama Gakuin Women’s Junior College

Professionalization is one keyword that can be used to describe American society in the 19th century. For women, it meant that they were no longer able to enter the medical profession, which in the past had been considered mostly a feminine art. “Science” was an integral part of the drive toward professionalization in medicine. Elizabeth Blackwell became the first woman to overcome such alienation in spite of many hardships. Her motives were moral, which was, at that time, the “science” behind the medicine and of course an important character of femininity. Female doctors of subsequent generations differed from her. One reason for this was the advancement in medical knowledge; for example, the realization that germs, and not morals, played the major role in diseases. In this world of modern medicine, women still had to struggle for what they wanted. Only gradually did they become accepted into the Academy of Medicine and prestigious medical schools as professors. In addition, female faculty began to realize they had to speak up in order to live comfortably in a male-dominated academic community. In this way, women in medicine have established their social status through the change of “scientific” knowledge and with awareness of their own femininity.

Issues of women working in a population shrinking and aging society: a comparative study with gender perspectives

Yasuko Wachi
Faculty of Comparative Gender Studies, Graduate School of Humanities, Josai International University

This study deals with the change of needs for the certified female workers in the senior care services. According to the 2006 White Paper on Aging Society of Japan, it is projected that by 2040, 25% of the total population will be over age 75, and 43% will be over age 65. By 2039, the population of those under 15 will be less than ten million; by 2055, it will be less than 7.5 million. It is clear that the issue is the shrinking workforce in Japan. The increase in the number of certified female care workers in the workforce has mostly been in the urban area. Because of a high attrition rate, money leaving the market within three years, Japan has an acute need for care service providers. As major reasons for leaving the market, low pay and social evaluation, visiting home care workers’ difficulties and institutional care workers’ difficulties are revealed. The problem of early attrition should be addressed by improving the pay system, environmental conditions and raising social awareness. A need exists for an educational program for training the 18 year-old students in order to meet this urgent social need for a qualified and stable supply of care service providers in Japan. Women from the Southeast Asian countries, i.e. Malaysia, Indonesia and the Philippines, are moving in to work as care personnel. In China, women from rural areas are moving into the cities as major care service providers. In Norway, cross-border women workers are an important part of the care service providers, and the re-education of them in language and socio-cultural knowledge is vital due to the various evaluation levels. Therefore, the emphasis of this study is placed on the analysis of the socio-economic background for current situations and the facts of the ongoing education, clarifying the needs for women in higher education, as well as analyzing gender aspects of the globalization of the social welfare services for senior care in search of new viewpoints for 21st century women.
Academic performance characteristics of students who excel in physical education

Jun Iwatake
Ishikawa National College of Technology

The purpose of this study was to clarify the relationship between the results of physical education class and the results of the academic performance in the first grade of a high school. The subjects were 156 schoolboys and 46 schoolgirls. The results of physical education class were calculated from performance in track and field, swimming, volleyball and basketball. The results of the science course subjects were calculated from those of mathematics, chemistry and physics. The results of the liberal arts course subjects were calculated from those for Japanese, English and history. The result of this study showed that the students who excelled science course subjects excelled in physical education. Physical education and science course subjects share the same problem-solving methods in which logical patterns must be applied. Physical education has the potential to accelerate the development of logical thinking. The findings of this study are considered useful for application to physical education class.

A study on career maturity of Japan football league players

Mami Inoue¹, Motoki Mizuno¹,²
¹Juntendo University School of Sports and Health Science
²Juntendo University Graduate School of Sports and Health Science

In this study, we investigated the career maturity of Japanese football players. The interest of this study was to consider the career maturity and skills of Japan Football League (JFL) players. Therefore, we carried out interview surveys about the timing of career transition. The result indicated that as they passed the period of transition their skills were improved. Consequently, one of the important implications is to implement some career support early in their professional career which will allow for concentration on a present competitive activity without a career anxiety. In addition, such a career approach will contribute to the construction of a successful second career.

One-side dominance in humans: functional characteristics of the upper and lower extremities in soccer players

Akiyoshi Matsumura¹, Kyoko Takeuchi², Yoshihiro Nakamura¹, Nobuo Kikuhara³, Yutaka Takahashi¹, Kazuo Maie¹ and Morihiko Okada²
¹Department of Biology, National Defense Medical College
²Teikyo Heisei University
³Department of Mathematics, National Defense Medical College
⁴Department of Education, Saitama University
⁵Life Science Museum, Otsuma Women’s University

Not much study has been conducted on functional differentiation of the right or left side dominance in the upper and lower extremities in view of adaptation by exercise or movement. Questionnaires were designed and distributed for comparative analysis on the relations between soccer skills and one-side dominance in exercising, moving or keeping postures. The subjects are male college students of S University; 20 students belonging to a university soccer club who started soccer practice around 5 years of age (the advanced soccer experience group) and 103 students of the same age group without any current soccer practice. The latter group was divided into two groups; 26 with
some soccer practice experience in middle or high schools (the medium experience group) and 77 with no soccer experience, the control group. In the questionnaire, 11-scale ratings were given on one-side dominance about 30 items; 12 items of the upper extremities, 13 item of the lower extremities and 5 items of the head. On these data, correlations among the ratings were examined and multivariate analysis was carried out. In the advanced soccer experience group, the correlations between the dominant hand and the dominant leg were smaller than in the control group. The correlations in the medium soccer experience group were somewhere between the advanced group and the control group, showing larger variations. This result indicates that the more skilled in soccer, the smaller one-side dominance becomes in the players’ upper and lower extremities functions. In soccer practice, some practical function is gained to control right or left side dominance giving more refined adjustability. The result of multivariate analysis supported this conclusion.

What is the competitive stress for the Japanese university athletes? Elucidation of the negative spillover with performing both roles of a student and an athlete

Yasuyuki Yamada1, Kodai Oka2, Yujiro Kawata3, Motoki Mizuno1,3 and Masataka Hirosawa1,3
1 Juntendo University School of Health and Sports Science
2 Mizuno Corporation
3 Juntendo University Graduate School of Health and Sports Science

As university athletes perform the multiple roles of a “student” and an “athlete,” many parts of their competitive stress may be explained from the perspective of “negative spillover” (NSP). This is because, in the occupational field, NSP is the undesirable form of the interface between multiple roles. Hence, in order to establish a new perspective to intervene between the competitive stresses among university athletes, this study aimed to clarify the existence of NSP between the roles of a student and an athlete (Study 1) and its effects on their mental health (Study 2). In study 1, we collected free descriptions about competitive stressors from 67 Japanese university athletes. Among these samples, 38 samples described some kind of NSP. We then created 16 NSP items based on their descriptions. In study 2, we carried out a questionnaire investigation of 254 university athletes using the NSP items and a depression scale (SDS). We found four factors from NSP items; athlete-to-student psychological NSP (A-S-PsNSP), athlete-to-student physical NSP (A-S-PhNSP), student-to-athlete psychological NSP (S-A-PsNSP), and student-to-athlete physical NSP (S-A-PhNSP). Moreover, the S-A-PsNSP and S-A-PhNSP correlated with depression significantly (r>0.20, p<0.001). These results indicated that university athletes actually suffered from NSP. Therefore, it is expected that NSP will become a new perspective to understand the competitive stress among university athletes.

A case study on team building training on university athletes: recognition between self’s and other’s points of view

Yasuyuki Hochi1, Mami Inoue1, Motoki Mizuno1,2
1 Juntendo University Graduate School of Sports and Health Science,
2 Juntendo University School of Sports and Health Science

The purpose of this study is to clarify the gap between self-recognition and recognition by the others in every member of a team by using the Life Position Check Sheet. In this study, TPI test was carried out for a university decathlon team in advance and an intervention was actually made by using the Team Building (TB) technique with the theoretical approach of transactional analysis. As a result of the comparison between the gap of self-recognition and recognition by the others, all of the members made improvement on at least two items after the intervention. The average of all items
indicating the gap improved after the intervention by TB for three or four members. Also the average of the gap of all the members improved. Summarizing these results, this study indicated that the intervention using TB decreases the gap between self-recognition and recognition by the others for each member.

A study on the undermining effect among sports university students

Kazusa Oki¹, Kentaro Inaba², Motoki Mizuno¹² and Masataka Hirosawa¹²
¹Graduate School of Health and Sports Science, Juntendo University
²School of Health and Sports Science, Juntendo University

When people received rewards for working on an interesting activity, they tended to display less interest in and willingness to work on that activity after termination of the rewards compared with people who had worked on the activity without receiving rewards. This phenomenon is labeled as the undermining effect (Deci and Ryan, 1980). Although many studies focussing on the undermining effect have been conducted in the educational and industrial fields, this effect has not been well examined in the sports domain. We examined whether this undermining effect arises among sports university students. 35 students (17 males and 18 females) were asked to do a jigsaw puzzle under the following three experimental conditions (within-subjects design): (1) with no information about financial rewards (control group), (2) giving financial rewards and (3) not giving financial rewards. We carried out a questionnaire composed of the intrinsic motivation scale, using the three above-mentioned experimental conditions. For the analysis, we compared the scores of intrinsic motivation in the three conditions using ANOVA. The score of the intrinsic motivation in condition (3) was not significantly lower than that in the other conditions. Therefore, in this study there was no undermining effect among sports university students. The results were discussed in terms of the participants, the difficulty of the task and the amount of reward.

Relationship between goal orientation and mental maturity among university track and field athletes in Japan

Yujiro Kawata¹, Yasuyuki Yamada², Motoki Mizuno¹², Masataka Hirosawa¹²
¹Juntendo University Graduate School of Health and Sports Science, Chiba, Japan
²Juntendo University School of Health and Sports Science, Chiba, Japan

It is believed that change in personality such as increase of the mental maturity level occurs among athletes through their athletic experiences. However, there are not enough evidence to verify it. In addition, it is not well examined what psychological factors play an important role in personality change among athletes. This study examined: (1) relationship between the years of experience with sports and psychological maturity, and (2) relationship between goal orientation (task orientation and ego orientation) and psychological maturity. We conducted a survey on university track and field athletes in Japan. Subjects were asked of their age and to fill out a Task and Ego Orientation in Sport Questionnaire, and their mental maturity as an athlete was evaluated. The results revealed that the number of years as athlete was significantly related to mental maturity among male athletes, while no significant relationship was found among female athletes. On the other hand, task orientation indicated a relation to mental maturity in both male and female athletes. These results were discussed from the perspectives of psychological development.
Listing the basic problems of bed-fence-covers in hospitals for preventing accidents based on the investigation into the actual conditions: for developing a safer bed-fence cover for elderly patients

Megumi Matsuoka¹, Teuko Konishi¹, Mitsuko Toyoda¹ and Kazuo Maie²
¹Asao General Hospital of Rehabilitation
²Life Science Museum, Otsuma Women’s University

The basic problems of bed-fence-covers in hospitals were listed for preventing accidents, based on the investigation into actual conditions in a hospital in Kawasaki City; The Asao General Hospital of Rehabilitation. There were many elderly patients with dementia, higher brain dysfunction and/or psychosis in the hospital. They sometimes fall into the gaps of the bed-fence, resulting in serious accidents. It is not only because of the structure of the bed-fence, but also the characteristics of the patients. Therefore the authors listed the problems concerning the accidents to recognize them. As to their physical conditions, they could not move by themselves because of paralysis or a decrease in fitness, they could not feel when they were pinched by the gaps because of a decrease in sense, and they moved irregularly and violently without their intention. As to their mental conditions, they exhibited dangerous behaviour because of dementia, they could not control their behavior because of higher brain dysfunctions, and they could not control their feelings and moved violently because of mental disorders. The authors intend to develop a safer bed-fence cover to prevent these accidents for elderly patients.

A trial product of a new safety belt for wheelchair users and its evaluation, based on the actual investigation of falling accidents related to wheelchairs in a hospital

Teuko Konishi¹, Megumi Matsuoka¹, Mitsuko Toyoda¹ and Kazuo Maie²
¹Asao General Hospital of Rehabilitation
²Life Science Museum, Otsuma Women’s University

Elderly patients, especially when they cannot keep a stable sitting posture, get hurt seriously by falls. Preventing falling accidents is one of the most important issues for the elderly to keep their ADL. We investigated the actual falling accidents related to wheelchairs which occurred in a hospital, Asao General Hospital of Rehabilitation, and tried to make a new type of safety belts for elderly wheelchair users based on this investigation. The trial product was evaluated by the care providers. The total number of falling accidents in the hospital amounted to 226 cases. It was observed that the patients removed their belts by themselves which was the most important point of the accidents. The evaluators of new belts were 91 care providers. The evaluation items included the convenience of fastening and removing the belts, the ability to hold the patient on the wheelchair, the safeness and ability to prevent a fall from the wheelchair and the appearance of the currently used belts compared to the new belts. A hygienic aspect and the utility of a pocket were also included. The new belts got better marks than the currently used belts, but we intend to improve the trial product (new belt) to be safer, more effective and more comfortable, based on the evaluation.
Examining the nurses utilization of the medical records after acquiring an electronic medical record system: a look at medical record usage and work flow pattern classified by work experience

Masayo Yamamura, Chihiro Takezawa, Yuki Mizuno, Fumiko Matsuda, Etsuko Takahashi, Toru Yoshikawa and Tetsuo Misawa

1 Chiba Institute of Technology
2 Tokyo Healthcare University
3 Toyo Gakuen University
4 The Institute for Science of Labour
5 Yokkaichi Nursing Medical Care University

Although information technology has increasingly become involved in medical institutions, the hospital examined in this study has not completely replaced its electronic medical record system. With the objective of understanding the actual usage of the electronic medical record system (EMRS) and the paper medical record system (PMRS), we conducted measurements based on observations of activities and traffic flow. The EMRS was used to both gather and record data, while the PMRS was mainly used for recording. We surmised that the same data is both “recorded” using the PMRS and “input” into the EMRS. We also found that the usage pattern of medical records differs according to years of experience. Regarding traffic flow, nurses with 1-2 years of experience moved around often for frequent quick and simple tasks, and performed data entry after their shift. Nurses with 3-5 years of experience recorded their collected data after performing treatments and examinations, and manage their schedule by organizing their tasks. Taking this into account, support for educating junior nurses regarding the organization of their tasks, and new arrangements in planning their tasks are needed.

Questionnaire survey targeting bicycle use by senior citizens

Teruo Uetake, Masahiro Shimoda, Morito Yamamoto, Sonoko Saeki, Masahiro Hayashi, Ryoko Miyakata, Kaori Yoshitake and Hirotaka Tanabe

Faculty of Agriculture, Tokyo University of Agriculture and Technology

Senior citizens frequently cause the traffic accident while riding a bicycle. Unfortunately the ratio of fatal bicyclist accidents involving senior citizens is very high. The Road Traffic Law was revised to reduce the number of bicyclist accidents involving senior citizens was implemented from June, 2008. However, the result of statistics on the number of accidents shows that the law is ineffective. In this research, the questionnaire survey on the bicycle use was conducted, targeting senior citizens (65 years old and older) to find a more effective measure to prevent such accidents. In the questionnaire, the targets were asked how they felt about a bicyclist from three different points of view: a pedestrian, a car driver, and a bicyclist. The result was interesting. Many are not troubled when a bicyclist rings bell as he/she passed them. They themselves used a bell or used their own voice as a warning signal as they passed pedestrians. As a pedestrian and a car driver, many were cautious about direction of the bicyclist’s sight. Also, more than a half of the targets had fallen while riding a bicycle.
Effect of design, approach angle and road condition on switching between a street to a sidewalk

Masahiro Hayashi, Sonoko Saeki, Ryoko Miyakata, Kaori Yoshitake, Hirotaka Tanabe, Morito Yamamoto, Masahiro Shimoda and Teruo Uetake
Faculty of Agriculture, Tokyo University of Agriculture and Technology

Many bicyclists fall down as they try to make a switch from a street to a sidewalk. Such a fall often causes a serious accident. In this research, we examined the influence of three factors; the design of the street-sidewalk boundary, the angle of approach taken by a bicycle, and condition of the road. For this experiment, four different designs were used: 50mm high, made of concrete (current standard design in Japan); 50mm high, made of concrete covered with metal; 20mm high, made of plastic; and 10mm high, made of rubber. Six approach angles were set, 15, 30, 45, 60, 75 and 90 degrees. Road conditions were dry or wet. It was revealed that about 50% of subjects were not able to run over the height difference of 50mm, made of concrete design corresponding to the present standard in Japan, when they took 15 degree of approach in dry road condition; no one could do so in wet condition. On the other hand, all were able to run over the height differences of 10mm made of rubber design regardless of the angle of approach or the road condition.

The relation of serum leptin concentration to body composition, physiological measurements and metabolic syndrome in postmenopausal women

Hongli Wang¹, Seung-Wook Choi², Tae-Young Kim³, Jae-Moon Lee⁴ and Masahiro Yamasaki⁵
¹Shenyang sport university
²Sungshin Women’s University
³Hankuk University of Foreign Studies
⁴Kyung Hee University
⁵Hiroshima University

We investigated the associations of serum leptin with body composition, blood and clinical measurements, physical work capacity, and metabolic syndrome in thirty postmenopausal women. Factor analysis extracted five factors, accounting for 78.37% of the total variance. Features of the important factors were: leptin and body fat; muscle mass and physical work capacity; and blood pressure and atherosclerosis. In backward linear regression analysis (R²=0.75, P<0.001), serum leptin positively correlated with body mass index (BMI) (P<0.001), systolic blood pressure (P<0.01) and insulin (P=0.06), and negatively correlated with the physical work capacity of 75% heart rate max (P<0.001) and diastolic blood pressure (P<0.01). The increase in leptin was related to the increase in metabolic syndrome components (waist circumference, blood glucose, blood pressure, triglycerides, HDL-cholesterol,) (P<0.01), and leptin of the subjects with more than three metabolic components was higher compared to those with less than one component (P<0.01). Subjects with a high leptin level (>8.6ng/ml) had a higher risk in developing metabolic syndrome than those with a low level (≤8.6ng/ml) (odds ratio=6.00; 95%CI: 1.17–30.73; P<0.05). But, these associations were attenuated and showed no statistical significance after adjustment for BMI. In conclusion, leptin could be predicted from BMI, physical work capacity, blood pressure, and insulin, and the effect of high leptin on increasing a risk of metabolic syndrome was dependent on BMI in postmenopausal women.
Classification of bending angles in direct posture observations

Ganga Kumudini1 and Tetsuya Hasegawa2
1 Kinki University Graduate School
2 Kinki University

Evaluation of different postural angles and the risks of injury associated with various posture angles have been at the foundation of many studies, sometimes with conflicting results. Furthermore, the use of different methods of angle classifications makes comparison of the results and drawing sound conclusions impossible. Although reliability was high in OWAS, its rough angles classification limits its use in many studies. Therefore, the main aim of this paper was to review a new bending angle classification capable of measuring the bending of the back, twisted/not twisted condition and neck direction in direct posture observation methods. Postural angles were evaluated using a slide show of different combinations of postures showing the bending of the back (0, 15, 30, 45, 60, 75, 90 and over 90 degrees), twisting of the trunk (twisted/not twisted) and neck directions (neutral/side-ways). These were observed by six male observers in a series of experiments and their responses were evaluated. In addition, how the viewing position affected the observers’ correct responses was discussed. Study results revealed that deciding bending angles in direct posture observations required simple, understandable and not too precise classifications and that it was influenced by angle classification, twisted/not twisted situations, and viewing positions.

Simulation of heat production and perspiration

Kazuhiko Yamasaki1, Chie Saito1, Moe Kitta1 and Akiko Maeda2
1 Jissen Women’s University
2 Nagano Prefectural College

We made two models to simulate the heat production and perspiration of the human body in order to evaluate the comfortableness of clothes and tents. Model A was a standing type and was able to put on clothes such as a T-shirt, fleece jacket and rainwear. It consisted of a water vessel, filament lamps, a cylinder with a diameter of 9cm (the aluminum net was surrounded by towel), power cables and transformers. Model B was made for the evaluation of the livability of the tent. It consisted of a water vessel, a filament lamp, an aluminum net, a towel and power cables. In 15 °C below zero, the freezing point, the evaporation rate of model A was 25g/h for 50W and 85g/h for 150W under the condition of wearing clothes, while that of model B was 19g/h for 38W. We measured the amount of condensation by the use of two models and it was shown that the permeable cloth was better than non-permeable cloth for comfort.

Evaluation of healing

Kazuyoshi Sakamoto and Kazuyuki Mito
The University of Electro-Communications

The healing effect of playing with a “pet robot”, a bird awl, was observed and evaluated psychologically and physiologically. Ten subjective items with five levels were used for the psychological evaluation, and LF/HF value due to heart rate variability was applied physiologically. The LF/HF values before playing were classified into one of two states according to the value: the values of LF/HF under 2 and more than 2 were defined as the relax state and stress state, respectively. The change of LF/HF values before and after playing indicated the change of stress state or relax state. It
was found that a healing effect was detected as a decrease of LF/HF in stress state before playing.

**Examining the organization and method by employees’ participation in the backyard of a supermarket**

Toshihisa Doi, Yuki Goto and Toshiki Yamaoka  
*Faculty of Systems Engineering, Wakayama University*

This paper is about the organization and methods of a supermarket. The organization and methods of the supermarket were carried out for the goal of productivity increase based on an ergonomic method. This method was especially conducted with employees applying participatory ergonomics. Also, this improvement was aimed at the high-efficiency of work and the acquisition of know-how. The work improvement research was conducted from three standpoints: the employees’ feelings, the work-related tasks and the work flow line. Some problems related to these standpoints were extracted. The survey of the employees’ feeling was done by means of a questionnaire and interviews, the survey of the work-related tasks used a five-point task analysis, and the survey of the work flow line used link analysis. Also, the employees were urged to participate in those improvements through properly planned meetings. Then, some improvement ideas (layout changes, standardization of work and installation of complaints boxes, etc.) were implemented. As a result, the improvement was verified in terms of the movement of wagons and employees, reduction in useless movements, information sharing and communication among employees, etc. It can be presumed that employees’ participation had a good influence on importing the organization and methods.

**Offering nutrition calculation software designed for usage at meals**

Jun-ya Ohashi  
*Kinki University*

There are many people who should diet as a medical treatment. It is necessary, for precise diet execution, to determine the contents of meals at cooking. Organizing complete meals and measurement of foods at cooking is troublesome. This trouble becomes a strong barrier to starting a diet. Measurement of foods and calculation of nutrition at meal times is proposed as an easy way to start dieting. This diet method allows food selection at meals and enables the sharing of foods on a dish. This is expected to increase the satisfaction of meals. Software for nutrition calculation is developed for usage at meal times to support the diet. It is designed to run on a small PC, which is important to save space and not disturb the dining table while using the PC. It works on a personal digital assistance (Zaurus, Sharp Corporation, Japan) and Microsoft Windows. The consumed amount of each food, nutrition of each food in a unit, and the total nutrition of a meal and the day are arranged to be shown together on a small screen. This information during meals is expected to help increase knowledge and an interest in foods and nutrition although the measurement and data input during meals is a bothersome activity. This diet method is suited to be applied especially at the introduction period of a diet.
Revisiting ergonomic ISO-standards and their implementation: Part 3

Yoshio T. Ikeda¹ and Yoichi Masuzawa²
¹College of Business Administration, Aichi Institute of Technology
²Faculty of Social Systems Science, Chiba Institute of Technology

The present study attempts to build a new model for human resources management (HRM) which could satisfy the concerns and interests of both employers and employees in an organization. To achieve this goal, the study commenced with revisiting ISO 6385 as the base for its development. The first report identified the following important points for securing participation of all the parties relating to work system redesigning, the 17 useful terms and definitions for the basis of good communication and the optimization of the performance and effectiveness of the work system. The second report discussed the capability of the Ecological Task Analysis (ETA) as a tool to develop an implementation scheme. The applicability of some other ISO standards referred to by ISO 6385 for achieving this effort was also examined. It was also confirmed that the approach was appropriate to develop a model for a future HRM system. However, some other approach or research tools were needed to integrate jobs and/or departmental job relations. They could be the cognitive task analysis, macro-ergonomics concept and information transmission theory besides ETA. It requires more time to provide practitioners with some sort of relevant implementation manual.

Examination of factors which influences using the straps in trains

Motoo Nishioka¹, Tatsuo Ishibashi² and Kenji Tanaka³
¹Graduate School of Human Life Science, Osaka City University
²Department of Medical Social Work Studies, School of Human Services, Hokusho University
³XYMAX corporation

In trains barrier-free and universal design specifications are advanced in Japan according to the law for promoting barrier-free transport and facilities for the elderly and the disabled such as the New Barrier-free Act. This research project focuses on straps in a train. First, we carried out research on train straps in railroad coaches. We looked for problems associated with how straps were installed and used. Second, we experimented with keeping a standing posture while using straps. Then we got the physical and psychological data. The final purpose was to find the appropriate shapes and arrangements of straps in train coaches that enabled not only elderly people but also young people to use them more conveniently. We believe that the above-mentioned research results serve as basic data regarding the use of straps.

Psychological and physiological effects of the start time of PC software

Kazuyuki Mito and Kazuyoshi Sakamoto
The University of Electro-Communications

The influence of psychological and physiological functions was investigated by examining the speed of the start time of PC software. One male subject volunteered for this study. He activated software with different start times by a mouse click and responded with his feelings about each start time by the psychological method. Also, sweat production on the right thumb was observed for a physiological response. The start times had 9 conditions, from 1 to 25 seconds in steps of 3 seconds. The three different start screens were used: no-message, a splash window, and a progress bar. In the psychological function, the start screen with either the splash window or the progress bar was effective
during the waiting time for PC software. A significant response of sweat production was not observed in this experiment.

**Suggestion of the usability-task analysis that can extract user requirements efficiently**

Mamie Shinoda¹, Toshiki Yamaoka², Akio Fujiwara¹, Rie Tsutsui²  
¹ Graduate School of Systems Engineering, Wakayama University  
² Faculty of Systems Engineering, Wakayama University

A new usability-task analysis was proposed for extracting user requirements and usability evaluation. Four male and four female students of age 20 to 22 years participated in this study. Participants described both good and bad points of each of the tasks, evaluated each task with a scale between 1 to 5, and noted the reasons from both good and bad points of view. After the evaluation of each task was over, comprehensive evaluation was conducted on every task again. This study used the multiple regression analysis, the Quine-McCluskey method and the formal concept analysis to analyze data of the task analysis quantitatively. Importance of evaluating each task was demanded by the multiple regression analysis. It was demanded to know whether the combination of which tasks led to high evaluation by Quine-McCluskey. Relations of each task and user requirements and importance of user requirements were demanded by the formal concept analysis. The result clearly shows that the multiple regression analysis, the Quine-McCluskey method and the formal concept analysis used in usability-task analysis are useful methods for extracting user requirements and evaluation.

**Proposal of method of qualitative investigation for design concept construction**

Miki Kumekawa  
Kaisei High School

This research proposed the technique for design concept construction based on a qualitative investigation. At first, the design concept was defined by literature research and the structural model was proposed. As a result, the action, value, and means were extracted as factors for composing the design concept. Next, the design concept construction techniques used by the interview survey and the observational research were proposed. The effectiveness of the technique used by the interview survey was verified by the elderly people's grooming act design, and the effectiveness of the technique used by the observational research was verified by designing a new coffee shop. As a result, new design concepts were proposed.

**Comparison of Aomori with Okinawa about children’s sleeping and eating manners**

Hiroko Iwata  
Department of Life and Culture, Seirei Women’s Junior College

A questionnaire survey was conducted both in Aomori and Okinawa prefectures to compare the sleeping and eating manners of children. The subjects of this study were 574 children belonging to three to nine-year-old classes. The elementary school children in Aomori showed a tendency to go to bed early and get up early. On the other hand the elementary school children in Okinawa stayed up late at night. In both prefectures, most of the elementary school children went to bed earlier than the nursery school children. The sleeping time of the elementary school children in Okinawa was significantly shorter than that of children in Aomori (p<0.01). Although the sleeping manners were differ-
ent between the two prefectures, the eating manners were similar. Less than fifty percent of the children could eat enough of both breakfast and supper by the age of seven in both prefectures. The relationship between the time to get up in the morning and eating manners for breakfast and supper was independent for nursery school children, but it was not independent for elementary school children. The relationship between the sleeping time and the eating manners was independent among all the age groups of both prefectures.

Consideration of dependency on cellular phones seen at the usage frequency and time per day

Mayumi Sato\(^1\) and Takiko Sekine\(^2\)
\(^1\)Jissen Women’s University
\(^2\)Sagami Women’s University

We did a questionnaire survey concerning the cellular phone usage conditions for students (135 girls and 54 boys) of a university, a junior college and special schools in Japan. The contents of the questions were time of use, frequency of use per day and duration times. The cellular phone dependency assessed by the frequency of use and the time used during a day was considered. We set the level of the dependency based on the use frequency and time used. Dependency 1, 2, and 3 were made to correspond to the frequency (30 times a day, 20 times a day or 10 times a day or less) and time standards (3 hours a day, 2 hours a day or 1 hour or less). The number of pertinent people in each dependency was the highest in dependency 1, and decreased down to dependency 3. A boundary existed in the dependency scale 3-4 (corresponding to frequency 30-40 and time 3-4) where the men and women had an increase to the level of dependency, and it was thought to be an addicted dependency. The men and women with a frequency of 40 or more accounted for about 10%. It will be necessary to distinguish whether the group with high dependency will display an excessive dependency in the future.

A proposal on an observation method and a data analysis method

Toshiki Yamaoka
Faculty of Systems Engineering, Wakayama University

An observation method and a data analysis method were proposed. The observation method consists of a direct observation and an indirect observation. In the direct observation, observers look at users or objects (system) directly and note the differences of the user’s behaviour or objects when compared with their ordinary situation. In an indirect observation, the behaviours of a user or objects are recorded by recording devices like a video camera without any observers present and are analyzed later. The proposed observations in the study are as follows: (1) Observation from the viewpoint of user trace actions, or the characteristics of the product or operation panel; (2) Observation with the viewpoint focusing on users and the interaction between users and machine; (3) Observation of the organizational aspect of the Human Machine Interface. Collected observation data is analyzed by following methods; analysis is made based on the matrix of observation data in two stages. (1) Examine the relationship among collected observation data (The quantification 3, ISM, DEMATEL, Association rule, correspondence analysis (+ cluster analysis) and Formal Concept Analysis are useful methods for examining the relationship among collected observation data); (2) Examine the relationship between users and objects (system) (Correspondence analysis (+ cluster analysis), formal Concept Analysis and Quine-MacCluskey method (Boolean Algebra) can examine the relationship between users and objects or system).
Design elements of comprehensible warning pictograms for children

Naofumi Yamamoto and Akira Okada
Graduate School of Human Life Science, Osaka City University

Warning pictograms can be more effective for children than text-based warning signs because they lack reading skills. However, little research has been conducted into the design of comprehensible warning pictograms for child safety in the use of home appliances, public equipment, etc. We attempted, therefore, to investigate the design elements of warning pictograms that influence comprehensibility and propose guidelines for the design of pictograms for children. Two series of experiments were performed. Forty-three children, aged 3–5 years, and 12 young adults participated in experiment 1. They were asked about the meanings of 10 or 12 warning pictograms, designed according to authorized standards, showing photographs of the actual scene in which each pictogram was used. Results indicated that the understanding rate of hazard identification by these pictograms in children was lower than that in adults. In general, children tended to fail to identify pictograms including unknown or abstract elements. An additional 15 children, aged 4–5 years, participated in experiment 2, in which they were asked about the meanings of 8 redesigned pictograms. The understanding rates for all of these pictograms were higher than those for the pictograms with the same meanings used in experiment 1. These results indicated appropriate design elements for comprehensible warning pictograms for children.

Analysis of traffic accidents of taxis as an application for transportation safety management making use of an image-recording-type drive recorder

Sadao Horino, Midori Mori and Noboru Kubo
Kanagawa University

While the frequency and the number of fatalities/injuries from traffic accidents have been decreasing since 2006, they are still a serious concern. Furthermore, the frequency of traffic accidents caused by professionals such as taxi, bus and truck drivers are higher than that by general drivers. It is very important to take effective measures, although the reasons behind such a high accident rate is not certain. Image-recording-type drive recorders were developed to meet the demands and are now increasingly being adopted by taxi companies. When a sudden braking, accelerating or steering incident occurs with more than 0.4G acceleration, a drive recorder records the facts-based-process of an accident or a near accident. Driver-oriented analysis with large quantities of data obtained from 200 taxis in Tokyo revealed that they were very useful for accident/near accident analysis and their prevention as well. For instance, our study revealed that bicycles, rather than taxis, were the main causes of the incidents. In addition, a recent study dealing with huge amounts of data has shown that the common backgrounds such as traffic environmental factors behind a frequent pattern of accidents/near accidents can be found. Thus specific data collected from the video can be utilized as effective materials for safety management as well as for safety education.