

Score changes of University Personality Inventory  
according to academic year progression  
— Score changes of hearing impaired  
students after entrance —

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**Abstract:** We have been systematically conducting a University Personality Inventory (UPI) survey of our students since 1989 in order to assess their mental health status. Informed consent was obtained from all participating subjects. We observed a significant difference in average UPI scores between the hearing impaired and normal and visually impaired students, indicating that the hearing impaired group had a higher degree of mental health. Thus, comparing these three groups with respect to mental health, we found that the hearing impaired group differed significantly from the other two groups, whereas the visually impaired group was similar to the normal control group. However, these results were based on the UPI scores measured at entrance to the college. When we recognize that the UPI score may reflect mental adaptation to a new environment after college entrance, it is important to investigate changes of UPI score with respect to progression of a student from one academic year to the next. In this study, we investigated changes in the UPI score in hearing impaired students with academic year progression.

**Key Words:** mental health, UPI, hearing impaired, academic year progression

## 1. INTRODUCTION

Tsukuba College of Technology is the first three-year national college established as an institute of higher education for the visually and hearing impaired. Our college has two main objectives: to help the visually impaired become more self supportive and productive members of society by training them for meaningful careers, and to contribute to the progressive education of the disabled by developing educational methods suitable for them through modern science and technology. Tsukuba College of Technology has two divisions. The division for the visually impaired comprises acupuncture/moxibustion, physical therapy, and computer science departments, with a total of 40 new students admitted annually. The division for the hearing impaired comprises design, mechanical engineering, architectural engineering, and computer science & electronics departments, with a total of 50 new students admitted annually (Table 1). In total, 90 new students are admitted to Tsukuba College of Technology every year. Graduates of the departments of acupuncture/moxibustion and physical therapy are expected to become medical professionals in their respective fields.

Table 1. Tsukuba College of Technology

Division for the hearing impaired	Admissions	
	Single year	Total
Departments		
Design	10	30
Mechanical engineering	10	30
Architectural engineering	10	30
Information science and electronics	20	60
Subtotal	50	150
Division for the visually impaired	Admissions	
	Single year	Total
Departments		
Acupuncture/Moxibustion	20	60
Physical therapy	10	30
Computer science	10	30
Subtotal	40	120
Total	90	270

Graduates of other departments are expected to find careers in industry. Our college has a cooperative relationship with the National Technical Institute for the Deaf, part of the Rochester Institute of Technology in the United States.

We have been conducting a University Personality Inventory (UPI<sup>[1]</sup>) every spring since 1989, after we obtained an informed consent agreement from each student admitted. On the basis of the results, we are studying systematically each characteristic of the mental health status of the visual and hearing impaired students at our college. The UPI is a questionnaire developed to check the mental health of university students.<sup>[2]-[5]</sup> It consists of two parts: a "health questionnaire," and an answer sheet. The "health questionnaire" section of the UPI contains 60 simple questions numbered from 1 to 60. For example, Question 1 is: "I have a poor appetite," Question 10 is: "I prefer not to meet people," Question 25 is: "I sometimes want to die," Question 26 is: "Things seem unreal to me," and Question 60 is: "I am easily hurt by others." At our college, Braille editions are provided for totally blind students and those whose vision is severely impaired.

## 2. Background of the research

Our previous investigations<sup>[6]-[10]</sup> showed UPI scores of hearing impaired students were significantly lower than those of the normal control group. These results are noteworthy, because they indicate that the hearing impaired group had a higher degree of mental health, which means they feel less mental stress than the control group. Although both visual impairment and hearing impairment are considered as impairment of sensory organs, they are basically different from each other and thus, their state of mental health status should also differ. Considering the UPI scores among the visually impaired, hearing impaired and control groups, we may conclude that the hearing impaired group was significantly different, while the control and visually impaired groups showed more similar characteristics.

The decrease in the amount of self-reported mental stress in the hearing impaired students has both a positive and negative interpretation. From a positive viewpoint, we may say that most of the hearing impaired students understand and accept their impairment, and attempt to maintain an optimistic outlook instead of worrying excessively. In this respect, we could say the world of the hearing impaired is a kind of cheerful, outward looking world. On the other hand, their apparent freedom from mental stress might be only superficial, for the possibility exists that the sensory deprivation due to their impairment prevents them from properly identifying their mental and physical state, resulting in a high perceived degree of mental health. This may be a mechanism similar to that of alexithymia, which can lead to psychosomatic illness in people who cannot show their feelings or emotions through language. It may also be said that the mental development of hearing impaired students is slower than that of the non-impaired, because they obtain less information due to their impaired ability to communicate. Therefore, they may not consider their abnormal state of mind and body or failure to make and keep friends as problems.<sup>[11],[12]</sup>

Also, we cannot deny the possibility that the hearing impaired do not understand the meaning of the questions sufficiently, because their language development is slower than the non-impaired. If their lower UPI score is due to the possibility that they do not experience mental stress because of their sheltered environment, the UPI score may increase due to the increase of mental stress after they face a new environment in their second and the third year of college. Therefore, it is important to investigate changes in UPI score of the hearing impaired after college entrance. In this study, we investigated changes in the UPI score of the hearing impaired students with progression of the academic year.

### **3. Subjects and methods**

#### *3.1 Subjects*

The subjects were hearing impaired students 18 and 19 years of age at entrance. Their entrance years were 1995, 1996, and 1997 and the survey was done in May of each year. We excluded the students who repeated a year, took time off from school, or left school. Thus, we chose the students who moved up progressively from the first year to the third year. As the result, the number of subjects that entered in the years 1995, 1996, and 1997 were 46, 46, and 48, respectively (Table 2).

#### *3.2 Methods*

For the students that entered in 1995, the mean value of the UPI score was calculated for the first, second and third years. The same calculation was done for the students that entered in 1996 and 1997. Then, we compared the average UPI scores for the first, second and third years using the statistical method of paired comparisons. Informed consent was obtained from participating subjects.

### **4. Results**

#### *4.1 Score changes of UPI with respect to the academic year progression (Table 3)*

The mean value of the UPI score for students that entered in 1995 was 12.1, 9.7 and 9.0 for the first, second and third years, respectively. The mean value of the UPI score for students that entered in 1996 was 14.8, 11.3 and 10.2 for the first, second

and third years, respectively. The mean value of the UPI score for students that entered in 1997 was 14.2, 14.1 and 11.9 for the first, second and third years, respectively. As students progressed from one academic year to the next, there was a trend for the UPI score to decline. There was a significant difference between the first and second academic years and between the first and third years for students that entered in 1995. For students that entered in 1996, there was a significant difference between the first and third academic years. There was also a significant difference between the second and third academic years for students that entered in 1997. It was unexpected that the UPI score had tendency to decline with academic year progression.

#### 4.2 Comparison in terms of the schools that graduated students (Table 4)

We tried to analyze the UPI results with respect to the different schools that graduated students. We examined the UPI score with respect to academic year progression in students from Deaf schools and normal schools, respectively. First, the UPI score of the hearing impaired students was compared to the normal students.

Table 2. Subjects

Entrance year of 1995	18 years old	19 years old	Total
Male	31	2	33
Female	12	1	13
Total	43	3	46
Entrance year of 1996	18 years old	19 years old	Total
Male	21	9	30
Female	16	0	16
Total	37	9	46
Entrance year of 1997	18 years old	19 years old	Total
Male	27	9	36
Female	7	0	12
Total	34	9	48

Table 3. UPI scores of the hearing impaired students

Entrance year of 1995	UPI score (M±SD)	Significance (p<0.05)
The first year (1995)	12.1±8.3	*1 *2
The second year (1996)	9.7±6.3	*1
The third year (1997)	9.0±7.0	*2
Entrance year of 1996	UPI score (M±SD)	
The first year (1996)	14.8±12.4	*3
The second year (1997)	11.3±7.2	
The third year (1998)	10.2±8.2	*3
Entrance year of 1997	UPI score (M±SD)	
The first year (1997)	14.2±9.1	*4
The second year (1998)	14.1±12.0	
The third year (1999)	11.9±10.7	*4

There was no significant difference in the UPI scores between the two groups at each academic year of entrance from 1995 to 1997.

#### 4.3 Score changes of UPI of the hearing impaired students that graduated from normal schools with respect to academic year progression (Table 5)

There were no significant differences among UPI score changes of hearing impaired students that graduated from normal schools with respect to academic year progression beyond each entrance year.

#### 4.4 Score changes of UPI of the hearing impaired students that graduated from Deaf schools with respect to academic year progression (Table 6)

The UPI score of the students that graduated from Deaf schools showed a declining trend as students progressed from one year to the next. Some of the UPI mean values showed statistically significant differences. From these results, the trend for the UPI score to drop with respect to the academic year progression was more

Table 4. UPI scores of normal schools and Deaf schools with progression of the academic year

Entrance year of 1995	Normal schools (M±SD)	Deaf schools (M±SD)	Significance (p<0.05)
The first year (1995)	11.2±10.2	12.6±7.0	N.S.
The second year (1996)	8.8±6.9	10.2±5.9	N.S.
The third year (1997)	8.7±8.0	9.3±6.3	N.S.
Entrance year of 1996	Normal schools (M±SD)	Deaf schools(M±SD)	Significance (p<0.05)
The first year (1996)	11.9±10.4	16.8±13.4	N.S.
The second year (1997)	10.7±7.2	11.7±7.3	N.S.
The third year (1998)	10.8±10.1	9.7±6.7	N.S.
Entrance year of 1997	Normal schools (M±SD)	Deaf schools(M±SD)	Significance (p<0.05)
The first year (1997)	13.3±9.1	15.2±9.2	N.S.
The second year (1998)	15.2±13.4	12.9±10.3	N.S.
The third year (1999)	13.3±12.6	10.4±8.0	N.S.

Table 5. UPI scores of normal schools with progression of the academic year

Entrance year of 1995	Normal schools (M±SD)	Significance (p<0.05)
The first year (1995)	11.2±10.2	N.S.
The second year (1996)	8.8±6.9	N.S.
The third year (1997)	8.7±8.0	N.S.
Entrance year of 1996	Normal schools (M±SD)	Significance (p<0.05)
The first year (1996)	11.9±10.4	N.S.
The second year (1997)	10.7±7.2	N.S.
The third year (1998)	10.8±10.1	N.S.
Entrance year of 1997	Normal schools (M±SD)	Significance (p<0.05)
The first year (1997)	13.3±9.1	N.S.
The second year (1998)	15.2±13.4	N.S.
The third year (1999)	13.3±12.6	N.S.

Table 6. UPI scores of Deaf schools with progression of the academic year

Entrance year of	Normal schools (M±SD)	Significance (p<0.05)
The first year (1995)	12.6±7.0	*1 *1 p<0.05, one side
The second year (1996)	10.2±5.9	
The third year (1997)	9.3±6.3	*1
Entrance year of 1996	Normal schools (M±SD)	Significance (p<0.05)
The first year (1996)	16.8±13.4	*2, *3 *2 p<0.05, one side
The second year (1997)	11.7±7.3	*2
The third year (1998)	9.7±6.7	*3 *3 p<0.01, one side
Entrance year of 1997	Normal schools (M±SD)	Significance (p<0.05)
The first year (1997)	15.2±9.2	*4 *4 p<0.05, one side
The second year (1998)	12.9±10.3	
The third year (1999)	10.4±8.0	*4

conspicuous for students that graduated from Deaf schools than for students that graduated from normal schools.

## 5. Discussion

We investigated the trend for the UPI score of hearing impaired students to decrease with progression from one academic year to the next. First of all, we will address the environment of our college and the support system for the hearing impaired students.

### *Regarding University/dormitory life:*

The students of our college do not get much stress from so-called city life. The range of their daily life experience is limited to mainly the dormitory and peripheral convenience stores, where they can go on foot or by bicycle. Hence, they are not exposed to the usual societal influences. Especially, the graduates of Deaf school (high school), who have already experienced dormitory life, say that they do not have a sense of incongruity when they enter college. Their human relations other than their teachers have a tendency to be limited to their classmates. Students who get along well with each other, hope to enter the same unit of the dormitory, and their hope is easily realized. This means that the positive human relations of the group continue during the day and at night. The interchange of the men and women in the dormitory is entrusted to the awareness of everyone, and not limited. The unity of the hearing impaired students is very firm; the graduates of Deaf school have a feeling of solidarity.

### *Regarding education/employment:*

The students in our college do not have a hard time mentally and do not spend much time job hunting in comparison with typical college students because their employment rate is almost 100% as of now. The teachers are quick to grasp the condition of the students even if it is bad even if it is good, because of a small class size, and information is easy to disseminate among the students. The goal of the hearing impaired students is to pass the final examination and not to obtain certification, although visually impaired students intend to get certificates in

acupuncture and moxibustion mentor, or physical therapy. Considering these situations, which are different from normal colleges, hearing impaired students are supposed to enjoy college life without much mental stress, and thus it is surprising that the UPI score falls off with academic year progression. However, in the survey that used the 30-item Japanese version of the General Health Questionnaire, the mental health of hearing impaired persons was lower compared with persons who were not physically handicapped, but higher than persons with neurosis.<sup>[13]</sup> Such a report suggests to us that the environment and societal influences may play a crucial role in the amount of mental stress that is experienced by the hearing impaired. The trend that the UPI score falls off in accordance with academic year progression is more conspicuous in Deaf school graduates than in normal school graduates. On the other hand, a change of the UPI score was not observed in the graduates of normal schools. The exact reason for this difference is not clear and will be investigated in a future study. To achieve this aim, we plan to measure the UPI score at yearly intervals in students after they have graduated from our college.

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