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Research Article

The Development of the Life-Worldly Communication Scale (LWCS) for Elderly Persons in Geriatric Facilities

Yasuko Fukaya^{1*}, Ritsuko Wakabayashi¹, Kanako Yamakuma¹, Takanori Kitamura², Mai Yamanoi³, Keiko Omoto¹, Mizuki Numa¹, Aleksandar Djordjevic⁴

¹Kanto Gakuin University, Yokohama, Japan

²Tokai University, Tokyo, Japan

³Tokyo Healthcare University, Tokyo, Japan

⁴Independent Researcher, Republic of Serbia

***Corresponding author:** Yasuko Fukaya, Professor, Kanto Gakuin University Nursing, 1-50-1 Mitsuura-Higashi Kanazawa-ku, Yokohama, Kanagawa 236-8503, Japan. Tel: +819088556969; Email: yafukaya@kanto-gakuin.ac.jp

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Abstract

Life-worldly (Type II) communication, as opposed to Task-related (Type 1) communication, of elderly people may significantly affect their quality of life and their mental activity. Aim of this research was to create a Life Worldly Communication Scale (LWCS) for elderly people requiring nursing care at geriatric facilities, and to verify its reliability and validity. Participants were 41 elderly persons in geriatric facilities. We investigated the reliability with the internal consistency (Cronbach's alpha) and the stability (test-retest) of LWCS. We ascertained the validity of LWCS by (a) investigating its construct validity, (b) investigating its criterion-related validity, and (c) investigating the scale's concurrent validity. As a result of these analyses, it was revealed that the internal consistency of Cronbach's alpha = .87, indicating that there was sufficient consistency. The reproducibility in examinations was $r = 0.56$ ($p=0.00$), according to tests and retests. The theoretical construct of LWCS was supported by the factor analysis. Criterion-related validity of LWCS was confirmed by a significant correlation between LWCS and actual Type II utterance duration ($r = .53$, $p = .000$). Concurrent validity of LWCS was not proved.

Introduction

Rogers [1] defines that communication is a process of forming and sharing information between each other for mutual understanding among the persons involved. Thus, assuming that communication spreads across the full width of action exchanges between persons, it is understood that nursing profession is engaged in various types of communication while providing the service. Communication with patients, their family and other staff members make it possible to achieve all nursing works, including grasp of health and living condition of various patients, provision of information on medical care and nursing of patients, informed consent for

nursing goal and care plan for the patients, provision of care to the patients, evaluation of nursing, rapport building, etc. Therefore, the importance of communication for nursing has been always advocated by a number of nursing theorists and researchers [2-5].

Studies on the importance of communication in nursing for elderly persons have indicated that communication plays a significant role in construction, maintenance and development of the relationship between elderly persons and caregivers [6,7]. In particular, communication was necessary and indispensable for elderly persons in facilities in order to maintain their social life's [8]. Vivian [9] have revealed that patient's perceptions of how to

communicate with nurses are related to satisfaction and compliance of patients, and greatly influence the patients' outcome as a result. In community nursing, it was pointed out that communication, interaction, and relationship between nurses and patients affect the quality of local nursing services [10]. In this way, communication has a great influence on the Quality of Life (QOL) of elderly persons living under limited conditions [11,12,13].

However, despite the indication of the importance of communication for elderly persons, a number of problems have been pointed out regarding the communication between elderly persons and caregivers in the actual nursing scenes. The first problem is lack of quantity of communication. Armstrong-Esther [14,15,16] have pointed out that nurses frequently refer to the importance of social interaction with elderly persons, but in fact, they do not perform enough social interaction with patients. She has pointed out that nurses' priority for communication is extremely low in the actual nursing scenes. The second problem is about quality of communication. Hewison [17] suggests that nurses exercise authority over patients in verbal communication. Moreover, she also points out that both nurses and patients recognize this exercise of authority as a normal and necessary process, and such a power relation obstructs open communication for both. From a similar viewpoint, problems such as restrictive and one-sided conversation [18,19] have been pointed out, and lack of social exchanges [20] in elderly facilities has also been shown. Also, in recent years, Deborah [21] pointed out that the clients neglected the mechanical behavior of nurses, while they were trying to carry out their tasks. She also showed that the clients expected a human relationship, that means, nurses should not only see the disease, but also, they should see the patients as human beings.

The third problem relates to researching approach in study of communication between patients and nurses. Caris-Verhallen [22] has pointed out that most prior studies have not analysed elderly persons' contribution to communication as mutual action. Fleischer [23] has also indicated that most of the conventional literature on communication and interaction between nurses and patients mainly focuses on ideal communication of nurses, not on communication as it actually occurs as an interaction between patients and nurses. Furthermore, most of the prior studies have investigated communication between nurses and elderly persons solely in specific nursing scenes such as morning care and feeding, and have not investigated the entire span of communication between nurses and elderly persons in a whole day. Therefore, in one of our previous studies, the authors tape-recorded and transcribed all verbal communication that happened between elderly persons and caregivers in one day (9AM -5PM) so as to grasp how communication between elderly persons and caregivers in facilities actually occur, and identified duration and types of conversations between them. Conversation Analysis was employed to clarify characteristics of the interactions [24-27].

The result revealed that average utterance duration of the elderly persons who requires nursing care in elderly facilities was only four minutes per day, which was extremely short. It has been recognized that the way in which elderly persons communicate with caregivers significantly influence utterance duration of the elderly persons. We found two different types of communication between elderly persons and caregivers. The one is "Task-oriented communication (hereinafter called "Type I communication"), which relates to the process of nursing and care, and consisted of approximately 80% of communication in facilities. The other type of communication is "Life-worldly communication (hereinafter called "Type II communication"), which concerns psycho-social conversations usually performed in social life, and its rate was extremely low. We also found that Type II communication significantly tends to promote the utterance of elderly persons much more than Type I does.

As a characteristic of Type I communication, the communication is structured with caregivers' specific practice as a goal, and therefore, the conversation is predominantly led by the members of the staff. As a result, the utterance of elderly persons occurred only as a response to a question or an instruction. In other words, the utterances by elderly persons is severely controlled and restricted by the speech of the facility staff members, and as a result the elderly persons are not given opportunities to produce self-initiated utterances, obeying the care-related instructions of the staff. This seemed to explain, thus, the reason why Type I communication accounted for 80% of the whole communication that occurred in elderly facilities. On the other hand, it has been found that, in Type II communication, a caregiver offers a variety of topics that relate to the life-world of elderly persons, and thus, the elderly person is considered to be a teller of his/her life-world to the caregiver, who listens closely to the elderly person's narratives, by showing interest, concern and agreement, and in this way the conversation opportunity for the elderly persons was significantly expanded. In other words, elderly persons, who are given the appropriate opportunity, are able to speak on their own initiative about their life-worldly matters.

The extremely low quantity and duration of elderly persons' utterance in facilities would create a risk of threatening the elderly persons' quality of life and dignity as a person. Moreover, lack of Type II communication may decrease mental activities and cause dementia in elderly persons. In these respects, therefore, it is felt acutely necessary to conduct empirical studies on them, and to create a scale for the Type II communication, which would enable simple and accurate measurement and grasp of Type II communication, not only in facilities but also in hospitals and home care. This may also greatly contribute to evaluation and improvement of communication skills of caregivers and evaluation of quality of facilities. Furthermore, if relationship between Type II communication and mental activity of elderly persons is

verified, earlier individual intervention and systematic measures to suppress disuse and deterioration of cognitive function, would be made possible. Therefore, in this study, the authors aim is the development of a scale for measuring communication between elderly persons and caregivers in geriatric facilities. Furthermore, since this scale is intended to measure quantity of Type II communication, its constructive concept consists of the following two components, both of which we obtained in our previous studies: Topic that constitutes Type II communication (Type II communication by elderly persons in facilities) and caregivers' attitudes toward communication that influenced the duration of Type II communication.

Study Objective

To create a Life worldly (Type II) Communication Scale (Hereinafter abbreviated as LWCS) for elderly people requiring nursing care at geriatric facilities, and to verify its reliability and validity.

Definitions

Utterance

Any utterance spoken by elderly persons, either self-initiated or in response to speech of others. Utterance is categorised into the following two types:

Task-oriented communication (Type I communication)

Communication between elderly persons and caregivers about various nursing and caregiver tasks to enable the residents' activities of daily living.

Life-worldly communication (Type II communication)

Communication between elderly persons and caregivers about family, work and social events that occur in normal social life.

Study Method

Preparation of Tentative LWCS

In previous research, we qualitatively extracted the components of type II communication, with content analysis, of entire speech content of the elderly recorded during 1 day. Therefore, question items were created based on the speech contents of elderly people included in each component. In addition, we used the Interaction analysis to identify factors affecting the utterance duration of elderly people. Since this scale is aimed at measuring type II communication duration, question items were created from the above two factors. In this scale, 16 question items were selected comprising of: 9 questions on component elements of Type II speech extracted qualitatively from our previous studies (past life experience, family topics, friend/acquaintance topics, societal

matters, mental states, greetings, weather, and familiar living), and 7 questions related to interactions with staff that promote elderly persons spontaneity, or Type II speech (speech spontaneity, topic participant wanted to discuss, something participant wanted to say, speech encouragement, active listening, providing topics, attention to the elderly). The number of question items was made as small as possible, so as not to be a burden for the elderly. For each item, we created a 4-point Likert scale ranging from 0 (Did not speak at all) to 4 (Spoke a lot).

Pre-Test

We gave a pre-test to 6 elderly persons, and used it to assess how easy the questions were to understand and answer. Some revisions were made as a result. We also asked the respondents whether the number of questions was appropriate, and they indicated that they did not feel overburdened.

Survey Content

(1) Survey of basic attributes of elderly persons: Researchers used medical records to gather data on sex, age, ADL state (Functional independence measure: FIM), and degree of cognitive impairment (Hasegawa dementia scale: HDS-R). The reliability and validity of these scales (FIM and HDR-S) have been verified [28].

(2) Measurement of the communication duration: All of the communication that occurred during one day (9AM-5PM), between 41 survey participants and facility staff members, was recorded by IC recorder.

(3) Measurement of Quality of life (QOL): The revised version of Philadelphia Geriatric Centre (PGC) Morale Scale was used as the scale to measure the subjective well-being of the elderly, and its reliability and validity have been verified [29]. This scale is used as a measurement scale of QOL for elderly people.

(4) Measurement of Depression: NIMH Centre for Epidemiologic Studies Scale (CES-D) was used as the scale to measure depression of the elderly. CES-D was applied to various people and its reliability and validity were verified [30].

(5) Measurement of Temporary-version Type II communication question scale and re-test.

Study Participants

(1) A total of 41 elderly persons who matched the elderly person selection criteria outlined below participated. Participants were institutionalised in Kanagawa Prefecture, at 3 medical Sanatoriums (17 participants), and at 4 **nursing homes** for elderly persons (24 participants). There were 19 men (46.3%) and 22 women (53.7%). The average age was 84.77 years (SD = 6.95). 28 participants (68.3%) were not suffering from dementia (HDSR score \geq 21), and 13 participants (31.7%) were suffering from

dementia ($HDSR \leq 20$). 13 participants (31.7%) were suffering from depression (CESD score ≥ 16). ADL states: 18 participants (43.9%) were ambulatory, and 23 participants (56.1%) were wheelchair-bound.

(2) Elderly person selection criteria: ① aged 65 or older requiring institutionalisation, and ② having the ability to give consent. The following were excluded as participants: Those ① with severe hearing impairment, ② with severe speaking disorder, and ③ in an unstable physical condition.

Analysis Method

(1) Counting of Type II utterance duration and Type II utterance frequency Verbatim record that has been created from the recorded contents of the communication, was differentiated into Type I and Type II utterance, using a “Classification list of the speech type of the elderly person” made by the previous research. Type II utterance duration and Type II utterance frequency were then calculated. Three researchers categorised conversations corresponding to all communication types. When conversations were categorised differently by the researchers, the appropriate category was determined by discussing the context of the conversations. To measure the number of utterance frequency, one sentence was counted as one frequency. To enable time comparisons, utterance duration was calculated from written transcripts by counting two Japanese kana characters as one second.

(2) Investigation of Type II communication scale reliability/validity

We investigated the reliability of LWCS by (a) establishing the questions using factor analysis, (b) investigating the scale’s internal consistency using Cronbach’s alpha (a reliability coefficient), and (c) investigating its stability using the test-retest correlation coefficient.

We ascertained the validity of LWCS by (a) investigating its construct validity using principal component analysis, (b) investigating its criterion-related validity using the correlation between LWCS and Type II utterance duration/frequency, and (c) investigating the scale’s concurrent validity using its correlation with PGC Morale Scale and CES-D. IBM SPSS Statistics 22.0 was used for the analysis.

Ethical Considerations

The study objective, study method, study participation time, and anticipated benefits/drawbacks were explained to the participants and their families. We ensured that study participation was voluntary and explained that there were no disadvantages for not participating in the study. Issues such as ensuring privacy were explained using study request forms and all participants were required to submit consent forms from both themselves and their family. The study was approved by Tokai University’s ethics review committee.

Results

Item Analyses

We conducted item analyses designed to create a consistent scale with a high discriminatory power. The item analyses were: a normality test, check of response skewness, check of correlations between items, and item-total correlation test. To analyse the question items, we used the Shapiro-Wilk normality test to confirm that the responses to all 16 questions had normal distributions. We found deviations in the response score distributions of 3 questions: ‘Friend/acquaintance topics’, ‘societal matters’, and ‘greetings’. Since our scale is designed to be applicable to both at-home and institutional care settings, these question items were not excluded because they may affect Type II communication duration in home care.

We performed a cross-correlation analysis of the question items to check their categorisation, and found a fairly high correlation between the items: ‘topic participant wanted to discuss’ and ‘something participant wanted to say’ ($r = 0.75, p = 0.000$). Since these two questions are similar in nature and difficult to distinguish, we removed the question ‘something participant wanted to say’. None of the other question items had notably high correlations or low discriminatory power. We used an item-total correlation test to check the correlation between each item and the total score of 15 items. We adopted all 15 items as question items because each question item showed the significant correlation of at least $r = 0.61$ or more to the total score.

Descriptive Statistics

Our scale has a possible score range of 0 to 60 points; the score range for the 41 study participants was 0 to 32 points, averaging 14.60 (SD = 9.07). The type II utterance duration ranged from the minimum value of 1 second, to the maximum value of 1865 seconds, and the average was 288.79 seconds: 4.81 minutes (SD 454.99). 65.4% of elderly people were showing the average or below the average, when it comes to Type II speech duration. The type II utterance frequency ranged from the minimum value of 1 time, to the maximum value of 325 times, and the average was 54.46 times (SD 80.63).

Reliability Investigation

To investigate the reliability of our scale, we used Cronbach’s alpha reliability coefficient to check the scale’s internal consistency, and the test-retest correlation coefficient to analyse its stability. The 15 question items had a Cronbach’s alpha of 0.87. We ascertained the reproducibility of each item (1) from the correlation between test-retest, and (2) kappa statistic of each item. Using a three-week interval between test and retest, we obtained a result of $r = 0.56$ ($p = 0.000$), indicating a moderate level of stability.

Validity Investigation

Construct Validity: The construct validity of the scale was analysed by factor analysis with the Varimax rotation of the principle factor method. KMO and Bartlett’s tests were conducted to examine the validity of specimens for factor analysis. As a result, since the KMO value was 0.74, it was judged that this sample can perform factor analysis without problems (Table 1).

Table1: KMO and Bartlett's test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.74
Bartlett's sphericity test	Approx Chi-square	266.54
	df	105.00
	Sig	.00

As a result, 4 common factors were extracted with an eigenvalue of 1 or more. Initial eigenvalues were 5.38 for the first factor, 1.88 for the second factor, 1.36 for the third factor, 1.24 for the factor 4 (Table 2). As shown in the Scree plot, the eigenvalues after the second factor sharply decreased, as compared to the first factor’s eigenvalues (Figure 1). However, when compared with the decline rate of eigenvalues after Factor 5, it was judged that LWCS was a four factor structure. The cumulative contribution rate of these four factors after Balimax rotation was 55.60%.

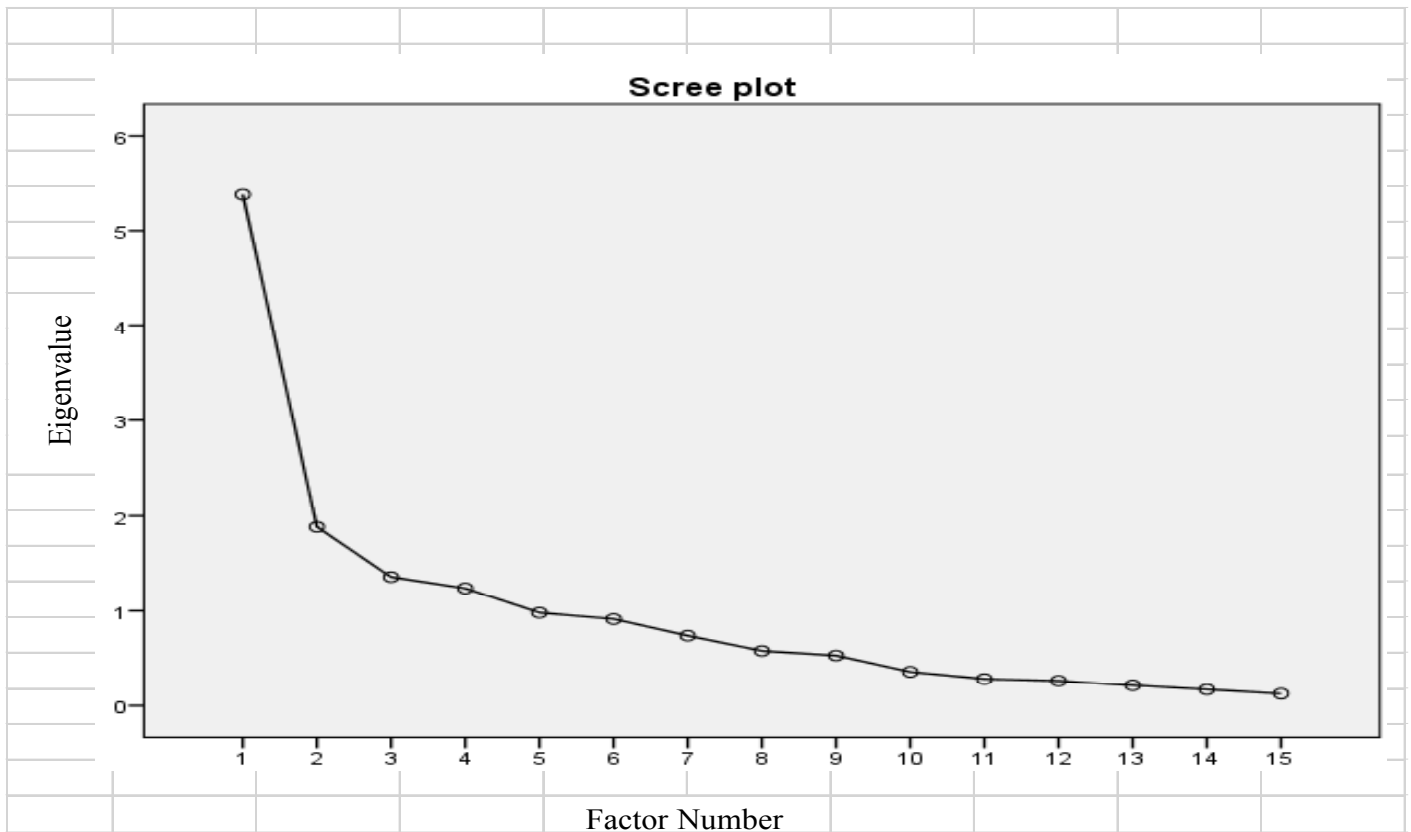


Figure1: Scree plot of eigen values

Table2 : Total Variance Explained of LWCS

Factor	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumrative %	Total	% of variance	Cumrative %	Total	% of variance	Cumrative %
1	5.38	35.87	35.87	4.98	33.17	33.17	2.73	18.17	18.17
2	1.88	12.56	48.43	1.47	9.78	42.95	2.27	15.15	33.32
3	1.36	9.04	57.47	1.02	6.83	49.78	1.88	12.53	45.85
4	1.24	8.25	65.72	.87	5.82	55.60	1.46	9.75	55.60
5	.98	6.53	72.24						
6	.91	6.09	78.33						
7	.74	4.91	83.24						
8	.58	3.85	87.09						
9	.53	3.52	90.61						
10	.36	2.37	92.98						
11	.28	1.87	94.85						
12	.26	1.74	96.59						
13	.22	1.43	98.03						
14	.17	1.14	99.16						
15	.13	.84	100.00						

Extraction Method : Principal Component Analysis,
Rotation Method: Varimax with Kaiser Normalization.

Table 3 shows what kind of question items are composed out of four common factors. The four common factors were named based on the interpretation of the meaning of the question items contained in each factor. These factors were (1) speech encouragement by the staff, (2) the topic of daily life, (3) spontaneity of the elderly, (4) trigger conversation. The first factor (speech encouragement by staff) had a contribution rate of 33.17%, while the second and subsequent factors had dramatically lower contribution rates of between 5.81 and 9.78%. We hypothesised that our scale would consist of two elements: (1) ‘everyday conversational topics’ and (2) ‘speech encouragement by the staff’), but factor analysis indicated a five-factor structure. However, since factors 2,3 and 4 could be classed as the subcategories of ‘everyday conversational topics’, our hypothesis is not contradicted by the results, and we therefore decided to use the 15 described items for our Type II communication scale.

	Component			
	1	2	3	4
QOCE3-2 Promotion of utterances	.84	-.02	.34	.19
QOCE3-4 The interest in the resident	.71	.31	.04	.29
QOCE3-3 Providing topics	.69	.28	-.03	.10
QOCE1-1 Past life experience	.58	.16	.08	-.08
QOCE3-1 Active listening	.56	-.11	.51	.31
QOCE1-3 Family topic	.27	.64	.20	.07
QOCE1-6 Psychological state	.07	.61	.24	.43
QOCE1-9 Immediate daily life	-.01	.57	.20	.07
QOCE1-4 Friend/acquaintance	.09	.53	.07	.14
QOCE1-5 Recent societal event	.24	.52	.08	-.02
QOCE1-2 Meals	.27	.35	.30	.08
QOCE2-2 Participant wanted to discuss	.12	.34	.81	.05
QOCE2-1 Spontaneity	.07	.32	.69	.03
QOCE1-8 Weather	.14	.22	.02	.92
QOCE1-7 Greetings	.37	.13	.37	.41
Eigenvalue	2.73	2.27	1.88	1.46
Pct of Var	18.17	15.15	12.53	9.75
Extraction Method: Principal Factor Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				

Criterion-Related Validity and Concurrent Validity: Criterion-related validity of LWCS was examined by observing the correlation between LWCS and actual type II utterance duration and type II utterance frequency. As a result, we observed that there is a significant correlation between LWCS and type II utterance duration ($r = .53, p = .000$). We also found significant correlation between LWCS and type II speech frequency ($r = .52, p = .000$) (Table4).

Investigation Item	Pearson's correlation coefficient	p value
Duration of Type II utterance	0.53	***
less than 5 minutes	0.28	
5 minutes or more	0.58	*
Frequency of Type II utterance	0.52	***
PGC	-0.16	
CES-D	0.17	
<i>Note.</i> *** = $p < .001$ * = $p < .05$		

The average type II utterance duration was as short as 4.81 minutes, and 65.4% of the elderly people were below the average of utterance duration. Therefore, we classified Type II utterance duration into (1) “Less than 5 minutes” category, and (2) “More than 5 minutes” category, and examined the relevance using LWCS. As a result, there was no significant correlation between LWCS and Type II utterance duration in elderly people of category 1, that is, with Type II speech duration of less than 5 minutes ($r = .28, p = .11$).

However, a significant correlation was found between LWCS and type II utterance duration in elderly people of category 2, that is, with type II speech duration of 5 minutes or more ($r = .58$, $p = .02$). This showed that elderly people in category 1 (with type II utterance duration of less than 5 minutes) decreased the relevance between type II utterance duration and LWCS. From the above, the criterion-related validity of LWCS was confirmed by observing the correlation between LWCS and type II utterance duration, and correlation between LWCS and type II speech frequency.

The concurrent validity of LWCS was examined by observing the correlation between LWCS and PGC-Morale Scale, and correlation between LWCS and CES-D, but no significant correlations were found in either case. Therefore, concurrent validity of LWCS was not proved (Table4).

Discussion

Reliability of LWCS was assessed from internal consistency among the items and reproducibility (stability) of the scale, and it revealed the internal consistency of Cronbach 'alpha = .87 for 15 items, indicating that there was sufficient consistency. The reproducibility was $r = 0.56$ ($p=0.000$) in examinations by tests and retests, indicating moderate correlation. Although clear criteria were not shown for adequacy of the retest reliability coefficient, it is regarded that the retest reliability coefficient of around .70 is generally enough for scientific studies [31]. The retest reliability coefficient in this study hasn't reached it. However, in elderly facilities, living programs such as recreation and events vary from day to day, so there may be differences in the communication environment between elderly people and care providers. For this reason, the retest reliability coefficient of LWCS was considered to be a reasonable result.

Adequacy of LWCS was assessed from three sides, construct validity, criterion-related validity and concurrent validity. It was assumed that the theoretical construct of LWCS was comprised of two components, "Topic that constitutes Type II communication" and "Caregiver's attitude to promote utterance of elderly persons", extracted from the previous study. The result of examination on the construct validity by a factor analysis extracted four elements, (1) speech encouragement by the staff, (2) the topic of daily life, (3) spontaneity of the elderly, (4) trigger conversation. However, the first factor "Speech encouragement by the staff" corresponded to "Caregiver's attitude to promote utterance of elderly persons" in theoretical components. The contents of factors 2 to 4 were included in "Topic that constitutes Type II communication". Since the cumulative contribution ratio by these four factors was 55.60%, adequacy of the theoretical construct of LWCS was supported by the factor analysis.

Moreover, from the eigenvalues of each factors, the first factor, "Urging speech by care providers", proved to have the

strongest influence on type II speech duration. This indicates that the elderly people's communication in facilities depends on the care provider's attitude towards communication. Therefore, it is important to maintain relationship so that caregivers can offer topics about the life-world of elderly persons, show their interest and concern about the story of the elderly persons and listen to the story, and to let the elderly persons continue talking.

In development of LWCS, the criterion-related validity was given the most importance. This is because the main purpose of this scale is to be able to easily and efficiently measure the type II speech duration of elderly people. Therefore, the criterion-related validity was assessed from the relationship between LWCS and Type II utterance duration, and relationship between LWCS and frequency of Type II utterance of elderly persons. The result revealed that there were significant correlations between LWCS and Type II utterance duration of elderly persons with $r = .53$ ($p = .000$), and between LWCS and the frequency of Type II utterance with $r = .52$ ($p = .000$), indicating that there is criterion-related validity in LWCS.

However, the average Type II utterance duration of the elderly persons was as short as 4.81 minutes. Therefore, another assessment was performed for the above relationship of LWCS and Type II utterance duration of elderly persons, with the average Type II utterance duration categorized into (1) "Less than 5 minutes" and (2) "More than 5 minutes". The result revealed that the correlation was $r = .58$ ($p = .02$) for the elderly persons of category (2) "More than 5 minutes", which is higher than the results of all elderly persons, while that of category (1) "Less than 5 minutes" did not show significant correlation.

What does this result suggest? Hewison [17] pointed out that nurses exercise authority over communication between patients and nurses, and both of them recognize this exercise of authority as a normal status. Furthermore, Drew [32] and Shattell [33] reported that patients take caregivers attitude as the one that excludes them, and feel that they are treated as objects. Fukaya [24] revealed that most of "Nurse-Senior" communication in elderly facilities is Type I communication. It has also been elucidated that caregivers recognize Type II communication as idle talk, not communication required for nursing specialists [25]. In this way, communication that is different from the one in everyday life is performed in hospitals and elderly facilities. It is possible that this form of communication is natural for elderly persons, as it is also natural for nurses, and elderly people may not expect type II communication to nurses. Also, the elderly persons, whose duration of Type II communication is less than 5 minutes, might be not able to identify if their communication is Type I or Type II.

One of concurrent validities of LWCS was assessed from the relationship between LWCS and QOL (PGC Morale Scale). Wang [13] pointed out that communication between elderly people

and staff members in the geriatric facility affected the QOL of elderly people. KIM [34] also showed that there is a significant relationship between the social support of the elderly and the PGC morale scale. Therefore, we assumed that Type II communication time and PGC morale scale are also significantly related. However, significant correlations were not recognized between these standards. Possible reasons are as follows: One is the problem of adequacy of the measurement scale (PGC morale scale) employed. PGC morale scale is designed to measure the subjective sense of well-being of the elderly persons. It has also been pointed out that the constructive concept of subjective well-being needs to be considered based on the two axes, (1) perception or emotion and (2) short term or long term [35]. Therefore we used this scale as effective for short-term measurements of perception and emotion. However, PGC moral scale measures happiness over several days, it may differ from the happiness on the day the survey by LWCS was conducted.

Moreover, Gudykunst [36] has pointed out that communication style is culturally influenced by individualism or collectivism. In collective culture, implicit messages and indirect messages whose meanings are embedded in people and sociocultural contexts are used more often in communication than in individualistic culture. Uchida [37] has indicated that the concept of happiness in the North-American culture relates to personal success, while that in Japan mainly relates to "Harmony in interpersonal relation". Type II communication is developed in relationship with caregivers. Therefore, in order to capture the well-being brought by communication, it is necessary to measure well-being based on what kind of culture persons lived in, we presume.

Another concurrent validity of LWCS was assessed based on its relationship with CES-D. We could not prove the concurrent validity in the relation between LWCS and CES-D, because in this study, 65% of the subjects had Type II communication of less than 5 minutes, and therefore, it is possible that Type II communication itself was not recognized. However, reasons why no relationships were seen between these scales have not been clarified.

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