

ORIGINAL ARTICLE

**Metaphor, Nurse's Vehicle to Carry Caring Mind  
An Analysis from Nursing Records**

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ABSTRACT

Nursing textbooks advice students to use literal expression expressions, which are considered to be objective. However, we recognize many metaphorical expressions are used by Japanese nurses. We surveyed database of Japanese Nursing Practice Example Accumulation Center (Kawashima, Retrieved 2012/4/14). The database included a large number of texts to explain nurses' activities.

Concepts developed in cognitive linguistics were used to excavate metaphors, then text mining was applied to sample metaphors systematically. The sampled metaphors were classified by types of source domain. Although it is needless to say that statements about emotions include metaphors, it was found that nurses use many metaphors in statements about facts. Nurses expressions, which include metaphors, are often understated, but the survey of the metaphors revealed that inclusion of the metaphor is expression of caring mind by nurses.

**Keywords:** Nurse record; Metaphor.

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### **Nursing and metaphorical studies :**

History of metaphor goes back to Aristoteles who referred to metaphors and their rhetorical effects in *Poetics* (Matsumoto & Oka, 1997). The rhetoric as one of Seven Liberal Arts was considered to be indispensable for educated person in the Middle Ages in Europe. However, the study of rhetoric went into decline with the advent of Modern Society and was forgotten in modern philosophy or in linguistics for a while. George Lakoff and Mark Johnson (1980), who were taking lead of cognitive linguistics, again shed lights over the metaphor in their work, **Metaphors We Live By**.

Influence of Lakoff & Johnson's work was not limited to linguistics. Rather the work provided new aspects in many sciences including nursing research. Frogatt (1998) reported importance of metaphors in emotional works by nurses. Wursbach (1999) analyzed historical change of nursing ethics by reviewing metaphors in nursing activities. Jo & An (2012) surveyed young Koreans regarding death metaphors. Metaphorical study is observed to be important field especially in holistic nursing. Hartrick & Schreiber (1998) said, "Exploring nursing metaphors can provide opportunities to develop new understandings of nursing and to challenge metaphorical images that may be constraining and /or obscuring significant elements of holistic nursing practice."

It is quite natural to use metaphors for our emotional communications. The metaphor is an effective tool to express our delicate feelings. Lankton & Lankton (1986) demonstrated the metaphorical expressions are effective in family therapy. Metaphors are also effective media to communicate emotions which may include contradictory judgments and to amalgamate conflicting images.

Most of metaphor studies in nursing passed over cognitive side of metaphors although Wursbach (ibid.) cited Black (1955) that metaphors are not merely emotive, but also cognitive. The metaphor studies have possibilities to improve whole nursing science beyond nursing ethics and holistic nursing, but had not been pursued enough

#### **Examples of metaphors in Japanese nursing:**

Japanese nurses use many metaphors during their clinical services. The metaphors are so natural and tied into nurses' modes of thought. The nurses are not conscious of the metaphors which are buried in language conventions.

Japanese nurses do not say, "Patient dies." Rather they say, "Saigo (mortal moment) wo (particle) mukaeru (salute)." "Saigo" means the mortal moment. "wo" is a particle used to indicate part of speech. The Japanese verb: "mukaeru" is usually used in a situation such as saluting a guest coming from a long distance. The Japanese metaphorical expression is literally translated as "Patient's mortal moment is saluted."

"Me (eye) wo (particle) hanashite (not contacted) iru (be) ida (while) ni (particle) bakkan (decannulation) ga (particle) okotta (happened)." This example is translated as "While I was looking away from patient, decannulation happened." "hanasu" is a verb which means increase of distance between two physical objects. Literal meaning of the expression is eye attached at needle is separated from the needle. Surface of needle must be attached with the surface of eye. It is not possible to contact needle, which is at patient's arm, with eye itself. The needle is an object located at the end of eye line.

A textbook of nursing record (Nin, 2006) introduces appropriate expressions for students to learn. "Family hopes patient would accept cancer treatment." In Japanese expression, "Kazoku (family) wa (particle) kanja (patient) ga (particle) gan (cancer) no (particle) chiryou (treatment) wo (particle) ukeru (accept) kibou (hope) wo (particle) idaku (hug)." Here, expression "idaku" is translated as hug in English. It is not possible to hug "kibou" which is an abstract entity. By using metaphorical expressions "hug", nurses' sincerity to expect recovery is expressed.

#### **Japanese culture and metaphors**

Japanese people use many metaphors in daily and cultural contexts. Japanese people express daily scenes by Haiku poetic style. The followings are examples of the old Haiku poem.

#### **English translation of Haiku (Metaphorical Japanese expression)**

*Ask for water from the neighbour  
Morning glory  
climbing up the well-bucket.*

By Chiyojo Kaga (Lived from 1703 to 1775)

**Non-metaphorical expression.** Vine of morning glory winds around the rope of well-bucket was not able to cut the vine. So I asked the neighbor for water.

**Connotation of Japanese / explanation of metaphor.**

The term: "climb" is used for a person. Vegetable does not climb. However, by using the "climb" metaphorically, respect and tenderness to living creature is expressed.

**English translation of Haiku (Metaphorical Japanese expression)**

What stillness!  
 The voices of the cicadas  
 Penetrate the rocks.  
 By Bashou Matsuo (Lived from 1716 to 1784)

**Non-metaphorical expression.** The area is very still except the sounds made by cicades.

**Connotation of Japanese / explanation of metaphor.**

Sound does not penetrate rocks. But by saying "penetrate", the stillness of area and voices of the cicadas monopolizing the area are stressed.

Poetic style is observed in history for at least over 1500 years. Modern writers are not exceptions. Haruki Murakami, who is a very popular novelist these days, is known for metaphors. The following is an example from his novel.

**Metaphorical Japanese expression (English translation).** Spaghettis were very shifty. They, any time soon, glide through brim of pan.

By Haruki Murakami (1949 to present)

**Non-metaphorical expression.** Spaghetti moves at the brim of pan.

**Connotation of Japanese / explanation of metaphor.**

Spaghetti, which is a food material, should not be shifty. By "glide through", active move of the Spaghetti is represented.

Novels, which include large number of metaphorical expressions, are read by Japanese without sense of discomfort. Japanese artistic expressions are often inseparable from the metaphor. For Japanese, it is difficult to recognize their use of metaphor since the metaphorical expressions are so natural. Until the epoch making work by George Lakoff and Mark Johnson (ibid.), people did not recognize metaphors which tied into cognitive processes. So are Japanese.

**Methodologies of metaphorical study by cognitive linguistics**

Van den Hoven & Herrlits (1997) advised, "Although some expressions can only be interpreted as

metaphors, sometimes words or sentences themselves do not provide sufficient information as to whether they should be interpreted literally or metaphorically."

Since the metaphors are so natural for Japanese and this study tackles cognitive aspects of metaphors which are buried into our cognitive process itself. Methodologies are needed to mine the metaphorical expressions otherwise most of the metaphors will be passed over. In this study, cognitive linguistics and its frame of analyses (Yamanashi, 2000, 2004; Nabeshima, 2011; Lee, 2011; Kövecses, 2000; Kövecses, 2010) are used to identify the metaphors.

**Kinds of metaphor.** In nursing metaphor study (Frogatt, ibid.; Wursbach, ibid.; Jo & An, ibid.; Hartrick & Schreiber, ibid.), metaphors are bound in one group. Purpose of these previous researches were to extract and compile metaphors which were related to emotion or psychological activities. These metaphors have simile like characteristics and their identifications are relatively easy. This study uses subdivisions of metaphor: metaphor (narrow sense), metonymy, synecdoche and Simile according to the cognitive linguistics. These subdivisions of the metaphor are used to excavate metaphors concealed in regular expressions.

**Metaphor** (narrow sense) is a literary figure of speech that describes a subject by asserting that it is, on some point of comparison, the same as another otherwise unrelated object. (Wikipedia, retrieved 2012/6/5)

**Metonymy** is a figure of speech consisting of the use of the name of one thing for that of another of which it is an attribute or with which it is associated (as "crown" in "lands belonging to the crown")

**Synecdoche** is a figure of speech by which a part is put for the whole (as fifty sail for fifty ships), the whole for a part (as society for high society), the species for the genus (as cutthroat for assassin), the genus for the species (as a creature for a man), or the name of the material for the thing made (as boards for stage) (Webster's Dictionary)

**Simile** is a figure of speech that directly compares two different things, usually employing the words "like" or "as". (Wikipedia, retrieved 2012/06/07)

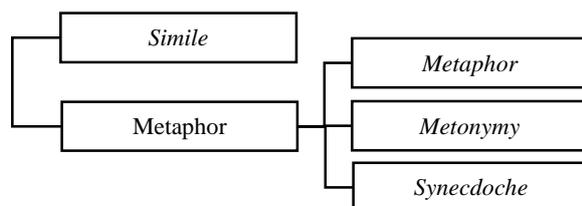


Fig 1. Kinds of Metaphor

**Prototype, Metaphor, and Schema.** Structure of metaphoric expression is explained by the next Figure 2. Suppose that there is literal expression: "Information got out." This expression designates a fact that information got out. This literal expression is pedestrian. Then this literal expression is switched over to metaphorical expression. By switching over to the literal expression into metaphorical expression, narrator becomes to be able to use semantic and pragmatic representational structure of the metaphor.

Prototype is an expression, which has originally nothing to do with the literal expression although some of characteristics of the prototype and literal expression are analogous. To compose a metaphor is to become aware of the analogies between the original literal expression and the prototype, then to apply representational structure of the prototype to the literal expression. Scheme is meta level description of metaphorical expression commonly observed at both prototype

and metaphor. (See Fig2. Area of Langacker's Categorical Triangle.)

In case of the example of Fig. 2, there was relationship between source domain of the prototype: "liquid" and domain of literal expression: "information." However, the "liquid" and the "information" possess some analogous characteristics. Designation mechanism of prototype was borrowed for the original literal expression and the metaphor was composed. Prototype: "liquid" had convention to relate to verbs: "leak", "flow", and "reduce" but the term: "information", which was used at literal expression, did not have convention to relate to verbs such as "leak", "flow", and "reduce". By applying designation mechanism of the prototype, metaphors are composed and the "information" becomes to be able to relate to: "leak", "flow", and "reduce". Thus metaphorical expressions: "Information leaks.", "Information flows.", and "information reduces." are composed.

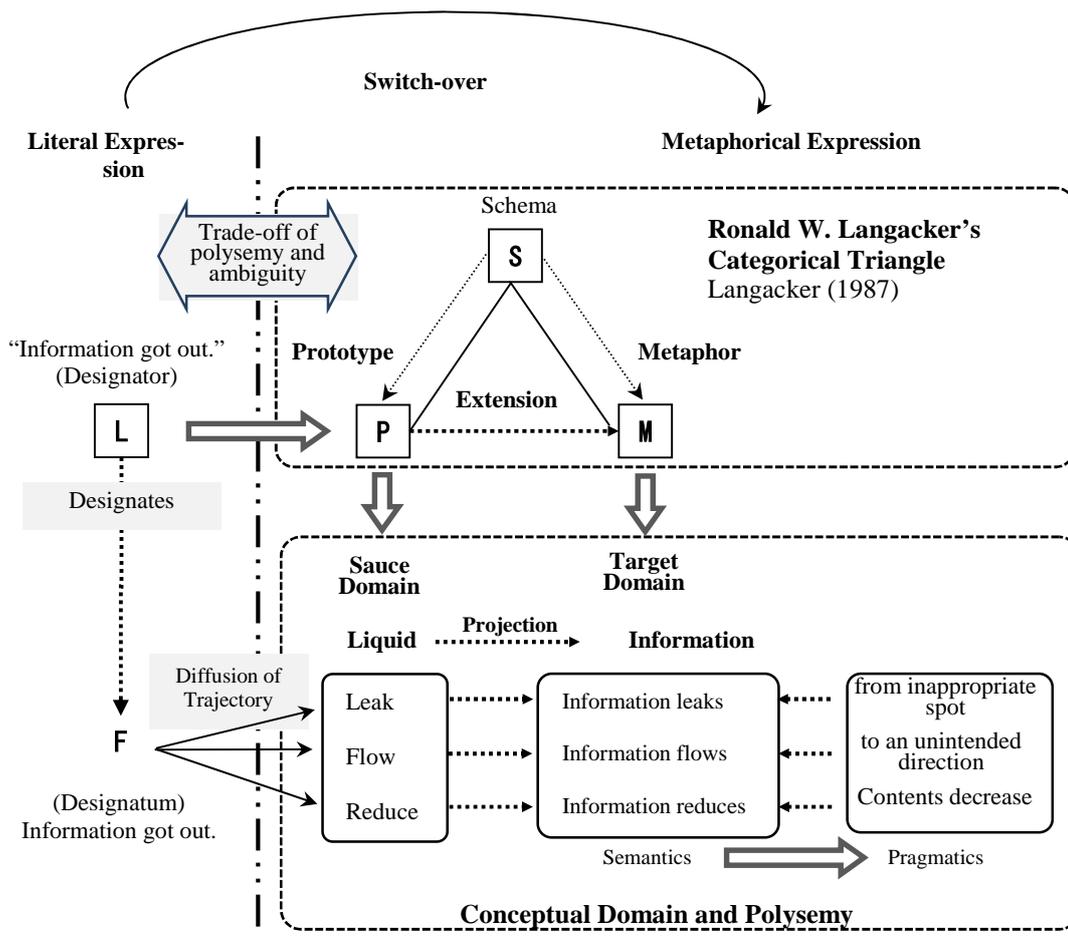


Fig 2. Metaphorical System

**Source Domain & Target Domain.** Source domain provides a reference map of designation mechanism for metaphor. Target domain is a conceptual domain projected according to the map provided by the source domain.

In case of Fig. 2, source domain provides a map to relate predicate verbs: “leak”, “flow”, “reduce” with subject: “liquid”. The target domain, which is projected from the source domain, relates these predicate verbs: “leak”, “flow”, “reduce” with the subject: “information” according to the map provided. (See Fig. 2 Area of Conceptual Domain and Polysemy).

Typically the source domain is composed of more concrete or physical concepts and the target domain is composed of more abstract concepts. Metaphor is a way of understanding abstract situation through tangible and physical experiences (Lee, *ibid.*). Most of constituent elements of the target domain, which is too abstract or novel to understand, are not preexisting (Wikipedia, retrieved 2012/6/1). The metaphor makes these not preexisting concept to exist and understandable.

A nurse who works between medical doctor and patient, in other words, between a person with medical knowledge and that without medical knowledge, acquired a habit to transfer abstract or not preexisting concepts to concrete or physical concepts. Geraldine W. van Rijn-van Tongeren (1997) indicated, “it is almost impossible not to use metaphors when we talk about abstract concepts.” A nurse, who uses metaphor, translates not preexisting abstract concepts into concrete or physical concepts understandable by patients. Nurse plays “a sturdy bridge between two islands” (Hartrick & Schreiber, 1998), more specifically bridge between medical professions and patients.

**Polysemy and metaphor.** The literal expression is supposed to maintain one to one correspondence between designator and designatum. However, by moving literal expression (Fig. 2. Left side) to metaphorical expression (Fig. 2. right side), range of inference expands. Trajectory of the literal expression is diffused to multiple directions by applying mapping structure of source domain to target domain. Thus metaphor acquires polysemy.

The literal expression, which originally did not have inference system like trajectories of source domain, borrows the inference system and metaphor becomes to be able to use the trajectories of the source

domain according to the mapping of the source domain. This is the process of acquisition of polysemy by the metaphor as target domain. Metaphor is given capability to infer multiple meanings.

Introduction of metaphorical expression is a trade-off of polysemy and ambiguity. Metaphor sacrifices strict correspondence between designator and designatum, but by introducing metaphor, trajectories of metaphorical expression diffuses. This diffusion brings polysemy and wealth of expression. However, the polysemy or the wealth is an ambiguity from a different angle.

From strictly medical point of view, ambiguity of expression should be prevented. Yet the strict scientific expression is too abstract or novel for patients. Multiple courses to understand the original scientific expression needs to be prepared for the patients whose socio-cultural backgrounds are various. Easily understandable way of expression needs to be prepared for each patient. Polysemy prepares possibility to respond multiple needs of the different patients.

Nurses feel that something is missing if their representation is limited to literal expression. This is particularly true when the nurses talk about a physiological fact while excluding emotions attached with the physiological fact. By literal expressions, the nurses, who are always imaging patients and their conditions, cannot feel that they say everything they want to say about the patients. The nurses diffuse the trajectory of expressions to satisfy their feeling.

It is not the role of medical profession to communicate scientifically accurate fact to a patient. It is devastating if the profession tells scientifically to a cancer patient, whose life expectancy is one month, that the patient can live only a month. Even if the profession cannot but tell the fact about the life expectancy, he/she will change or moderate the expression so that the patient will accept the fact. Metaphorical expression diffuses the trajectory of expression and increases possibility to absorb various responses. Hartrick & Schreiber (*ibid.*) indicated “Metaphor initiates unconscious processes and serves as a tool for evoking multiple levels of meaning. In this way, metaphors give new meaning and extended understanding about the phenomena.”

Rather than to use a regular expression about the fact: “A patient has surgery”, Japanese nurse uses a metaphorical expression: “A patient salutes surgery.”

The literally expression designates only technical operation, but the metaphorical expression designates not only the technical operation but also possibility of patient's conflicted feeling to decide surgery, uneasiness of families, pains the patient experienced, etc. "The metaphors and metonymies that serve as cognitive links between two or more distinct senses exist independently in our conceptual system" (Kövecses, 2010).

### **Conceptual and Perceptual representation.**

Medical science might have considered literal expression as desirable and superior and the imagery presentation as inappropriate or inferior. A metaphorical expression, which has multiple meanings or multiple trajectories, tends to be taken away as ambiguous. The metaphorical expression has trajectory to condition with emotional image. Medical expression is ideally conceptual representation and metaphorical expression, which is often used by nurses, approaches perception.

Suppose that there are two representations: "Body temperature is 39 Celsius." and "Red faced." The former is conceptual representation and the latter is perceptual representation. These two different representations activate two different activities. Conceptual representation: "Body temperature is 39 Celsius." may activate prescription of antifebrile. Imagery representation: "Red faced." may activate an action to bring an ice pack from nurse station. This is a difference in pragmatics rather than in semantics.

It is difficult to think conceptual representation, from which actual sense and living experience is eliminated, as pure symbolic operation. The conceptual representation comes with concrete situation or image indivisibly (Nabeshima, *ibid.*). Akasofu (*ibid.*) observes that a symbol represents mental phenomena and a concept represents abstracted content of thought. Metaphor encodes image-concept complex by letters.

If medical representation is the only appropriate expression, nurses should say, "cardiac arrest". Japanese nurses do not say so. Instead they say, "Patient's mortal moment is saluted (*mukaeru*).". The metaphor "salute (*mukaeru*)" includes respect to the course of life of the patient, sadness of the nurse who could not save the life, and nurses efforts to recover from the shock. By the metaphor, nurses can share the grief with the family.

The nurses integrate ontology and image, also integrate concept and perception by the metaphor. Hartrick & Schreibe (1998) aptly said, "a sturdy bridge between two islands." A nurse bridges between medical profession and patient by metaphors.

### **Validity of metaphor extraction**

Japanese Nursing Practice Example Accumulation Center (Kawashima, *ibid*) started to open database of clinical cases through internet. Data were collected from publications on nursing and peer reviewed by a multiple number of expert level nurses. Results were released to internet by common format. Each case includes texted explanation about the case. The database had reliable 577 case records from which total of 9,664 texts were obtained. The text data were randomly permuted many times.

The initial 500 texts out of 9,664 texts were interpreted according to guideline and concepts of cognitive linguistics (Lakoff & Johnson, 1980; Yamanashi, 2000; 2004; Nabeshima, *ibid.*; Lee, *ibid.*) as explained in the previous section and typical metaphors were sampled.

Then all the 9,664 records were reviewed by grouping function of text mining software: Text Mining Studio Ver. 4.1 (Mathematical Systems Inc., 2012). The grouping function is a subroutine to collect specific part of text from all the text data according to designated condition while automatically making judgment about flexion. Japanese is an agglutinative language and has many conjugations. It is not possible to collect data without the text mining software. Total of 440 kinds of metaphor were sampled.

### **Extracted metaphors**

Derived metaphors were grouped as (1) Metaphor of horizontal migration, (2) Metaphor of vertical migration, (3) Metaphor of qualitative change, (4) Metaphor of distance change, (5) Metaphor of relationship, and (6) Metaphor of visual perception. For each metaphor, English translation, cases applied, Source domain, meaning of source domain, target domain are reported. The meanings of source domain were referred to Japanese dictionaries (Niimura, 2008; Matsumura, 1995a; Matsumura, 1995b; Umesao et.al., 1996).

Table 1. Metaphor of horizontal traveling

“Susumu” 31kinds

English Translation	Go forward, come on
Applied to	ADL; Expansion; comes on; Weaning; Training; Self sustainability of procedure of stoma care; Incarnant; Rehabilitation; Rice gruel meal; Coaching; Ingestion intake; Cure; Treatment; Training of self-management; Transportation by wheel chair; Epithelialization; Food intake; Meal size; Pregnancy course; Self-support of passage; Diet in the hospital; Walking; Ambulation exercise; Radiotherapy; Ambulation.
	Debility; Decline in function; Weakness in a muscle; Brittle-bone disease; Bleeding & failure of the liver; Debilitation; disease state;
Source domain	"thing" as physical object.
Meaning of source domain	Horizontal transportation of thing
Target domain	Improvement of condition.

“Shinkou+ (suru)” 23 kinds

English Translation	Go forward, come on
Applied to	Cancer; Brain metastasis; Lung cancer; Pancreas cancer; DIC; disseminated intravascular coagulation; HDS-R point; Cachexia; Altered mentation; Necrosis; Failure of the liver; Loss in muscle strength; Respiratory acidosis; Akness of limbs. Disease; Symptom; Pain of wound; Cognitive symptoms; Atrophy of the brain; Disease; Condition of the disease; Chronic kidney failure; Algia; Decubitus.
Source domain	"thing" as physical object.
Meaning of source domain	Horizontal transportation of thing
Target domain	exacerbation
Comment	Forward transportation is usually regarded as positive change, but this Kango metaphor means negative change. The expression might be introduced with medical technology and translation settled.

“Koutai+ (suru)” 3 kinds

English Translation	Retreat
Applied to	ADL; Range of joint motion; Movement of ADL
Source domain	"thing" as physical object.
Meaning of source domain	Horizontal transportation of thing toward back with awareness to the front
Target domain	Deterioration of condition
Comment	The term was used in only surgical or orthopaedical area.

“Modoru” 10 kinds

English Translation	Come back to the starting point
Applied to	Her smiling face; Method to change frequently; Shining smile; Live alone; Condition of frequent urination; Artificial dialysis; Home care; Cardiac rate; Consciousness; Rice gruel.
Source domain	"thing" as physical object.
Meaning of source domain	Horizontal transportation of thing toward front then back, finally comes back to the initial starting point.
Target domain	Returning to the initial condition

Table 2. Metaphor of vertical traveling

“Agaru” 1 kind

English Translation	Come up
Applied to	Effect
Source domain	"thing" as physical object.
Meaning of source domain	Vertical upward transportation of thing.
Target domain	Improvement of condition

"Joushou+(suru)" 19 kinds

English Translation	Rise
Applied to -	Borg scale(value); CA19-9 (value); CRP (value); HbA1c (value); HR (value); ICP (value); SAT (value); SpO <sub>2</sub> (value); ST(value); Index; Blood amylase level (value); Brain temperature ·ICP (value); Leucocyte(number); HDS-R score; PaCO <sub>2</sub> Value; Todai-shiki Observational Rating Scale (value); Blood glucose(value); Pulsebeat.(value).
Parenthesis added by author	
Source domain	"thing" as physical object.
Meaning of source domain	Vertical stick out from horizontally spreading surface.
Target domain	Meaning at target domain is salient change observable. The higher the bump becomes, the more nurse involves. Quantitative increase is expressed by metonymy.. The increase is determined involuntarily and has nothing to do with patient's effort. Metonymy is used to express physiological index in English such as "Drop in Body Temperature", "Increase in Rate of Heartbeat" (Kövecses, 2000).
Comment	Forward transportation is usually regarded as positive change, but this Kango metaphor means negative change. The expression might be introduced with medical technology and translation settled.

“Takamaru”, “Takameru” 24 kinds

English Translation	Jack up, heighten
Applied to	Self-care ability; Motivation to rehabilitate; Consciousness to safety; Consciousness level; Exercise capacity; Motivation to recovery; Interest in outside world; Patient's consciousness; Interest in blood sugar control; Strength of child; Interest in meals; Motivation to fight against disease; Contentment; Comprehension. Stress; Degree of dependence; Muscle stress; Strain; Sense of tension; State of tension; Intraoral pressure; Concern to home care; Risk of falling.
Comment	Source domain is "thing" as physical object. Meaning of source domain is vertical stick out from horizontally spreading surface. Meaning at target domain is salient change observable. The higher the bump becomes, the more nurse involves.
Source domain	"functional capability" as attribute
Meaning of source domain	Increase of height, be flourished
Target domain	1. Increase in function, 2. Grow worse

“Koujou+ (suru)” 16 kinds

English Translation	Goes up
Applied to	ADL; QOL; Self-care capability; Conscious level; Amount of exercise; Range of movement; Intensive care; Function; Muscle force; Wife's care ability; Self-motivation; Spontaneous function; Spontaneous movement; Procedures; Power of endurance; Aeration property; Cognition.
Source domain	"functional capability" as attribute
Meaning of source domain	Increase of height, be flourished, Improve
Target domain	Increase in function

Table 2. Metaphor of vertical traveling cont.

"Fujou+(suru)"

2 kinds

English Translation	Broach
Applied to	Task; Discharge planning.
Source domain	"thing" as physical object.
Meaning of source domain	The object suddenly appears to the surface by buoyancy.
Target domain	Meaning at target domain is salient change observable. The higher the bump becomes, the more nurse involves.

"Sagaru"

2 kinds

English Translation	Come down
Applied to	BP(value); Blood glucose(value).
Source domain	"thing" as physical object.
Meaning of source domain	Vertical decrease of height
Target domain	Metonymy, decrease of numerical value. It is possible that these concepts were imported with medical knowledge then translated into Kango, term with Chinese origin.

"Teika+ (suru)"

47 kinds

English Translation	Descend
Applied to	BP(value); Blood Pressure(value); HR (value); Cardiac index(value); Brain blood flow (quantity); Leucocyte(value); Pulse beat(Frequency); J C S (value); Degree of oxygen saturation(value); PSST (score); SAT (value); SpO <sub>2</sub> (value);TP (value);Albumin(value); Zinc/Copper Intake (value); Maximum emiction pressure (value);Tumor marker(value).
Parenthesis added by author	ADL; Condition of the nutrition; Lower-limb muscle strength;Activity; Hepatic function; Pharyngeal sense; Muscle strength; Retention and recall; Respiratory condition; Left heart function; Retention and recall; Respiratory condition; Oxygen intake function; Stress; Consciousness; Motivation; Faculty of orientation; Consciousness level; Self-purification effect; Self-esteem; Spontaneous breathing; Subjective sense of health; Mani-phalanx muscle;Appetite; function of the kidney(value); Lingual movement; Ciliary motion; Elasticity; Bowel peristalsis. Entire body function; Physical capacity; Capability; Standby capacity.
Source domain	"thing" as physical object.
Meaning of source domain	Vertical decrease of height
Target domain	1. Metonymy, decrease of numerical value, 2.Deterioration of function

"Kakou+ (suru)"

3 kinds

English Translation	Down
Applied to	HbA1c(value); Blood Pressure (value); Blood glucose (value).
Source domain	"thing" as physical object.
Meaning of source domain	Object descends its height.
Target domain	Metonymy used to represent decrease of numerical value. The term is Kango, expressed by Chinese characters.

Table 3. Metaphor of qualitative change

“Fueru”

21 kinds

English Translation	Mount up
Applied to	Medical procedure (frequency); Nurse call (frequency); House hold work (quantity); Intervention hours (number); Outing (frequency); Sleep out (frequency); Conversation (frequency); Voluntary action (frequency); Question (frequency); Smiles (frequency); Conversation with other patient (frequency); Salivary secretion (quantity); Body weight (value); Important time (number); Involvement with other patient in the same room; Speech (number); Message communication (frequency); Burden share (quantity); Interview (frequency); Sound sleep at night (frequency); Rejection of drug intake (frequency)
Parenthesis added by author	
Source domain	"thing" as physical object
Meaning of source domain	Object is piled over another object and whole amount increases.
Target domain	Metonymy used to present increase.

“Zouka+ (suru)”

16 kinds

English Translation	Increase
Applied to	RR(value); Calorie (number); (A number of) What a patient can do; Snack between meals (frequency); Density of bone (value); Oxygen intake (quantity); Sound sleep (frequency); Salivary secretion (quantity); Body weight (value); bladder emptying (quantity); Pulmonary blood flow (value); Speech (frequency); Mottle at skin (number); Inhibition stress (Quantity); Algia (frequency); phlegm (quantity)
Parenthesis added by author	
Source domain	"thing" as physical object
Meaning of source domain	Object is piled over another object and whole amount increases. Kango.
Target domain	Metonymy used to present increase.

“Kakudai+ (suru)”

15 kinds

English Translation	Expand
Applied to	ADL (value); CTR; Mobility capability; Joint range of motion; Red flare at cavity of mouth; (Range of) transportation; (Amount of) freedom of activity; Independent seated position; Indoor walking (Level); Range of living activities; Range of body motion; (Size of) Red flare; Red flare part; Font (size); Range (of area) of walking
Parenthesis added by author	
Source domain	"thing" as physical object
Meaning of source domain	Increase the size of object without changing inter characteristics or structure.
Target domain	Metonymy, increase value.

“Heru”

10 kinds

English Translation	Go down
Applied to	This persons' pain (degree); Errors (frequency); Choke (frequency); Coughing&expectoration (quantity); Pleading of pain (frequency); Incontinence(frequency); Pleading (frequency); Nocturnal awakening(frequency); Pleading of anxiety (frequency); Disturbing behavior(frequency); Work load (quantity)
Parenthesis added by author	
Source domain	Object with quantity
Meaning of source domain	Decrease the amount of quantity as its top surface goes down.
Target domain	Decrease of degree.

Table 3. Metaphor of qualitative change cont

“Genshou+ (suru)”

28 kinds

English Translation	Decrease
Applied to Parenthesis added by author	T. Bil (density); Nurse call (frequency); Face scale (value); Payment of medical bill (number); Waking (hour); Tongue coat (area); Cried children (number); breathing trouble (frequency); Bacteria (number); Incontinency (frequency); Bleeding (quantity); Choke at meal intake (frequency); Food residual & bleeding of the gum (quantity); Effusion (quantity); Turn out of body (frequency); Energy consumption (quantity); Pleading (frequency); Saliva (quantity); Pressure (value); Body weight (value); Purulent sputum & Yellowish white viscous sputum (quantity); drainage of fluid (quantity); Leukocyte (number); Anxiety (frequency); turbulent (frequency); Ascites (quantity); salivation (quantity); Complaint of pain (frequency); Pain (number of place)
Source domain	Physical Object which as quantity
Meaning of source domain	Reduces quantity, downward reduction of quantity
Target domain	Metonymy Means reduction of numeric value

“Shukushou+ (suru)”

2 kinds

English Translation	Reduce, shrink
Applied to	ADL (value). Range of motion of upper extremities. (degree)
Source domain	Physical Object which as quantity
Meaning of source domain	Reduces whole quantity, 3 dimensional reduction
Target domain	Metonymy Means reduction of numeric value

Table 4. Metaphor of distance change

“Chikazuku”

4 kinds

English Translation	Come close
Applied to	Pressure in the capillary 32Hg; Death; Surgical operation; Discharge
Source domain	Distance between subject and object
Meaning of source domain	A object, which is located far from the subject, is getting close to the subject. Distance reduction is made by the approaching object. Object is directed toward the subject.
Target domain	Important event is going to happen with the passage of time.

“Kuru”

8 kinds

English Translation	Come from
Applied to	Sensation comes from diabetes; edema comes from diabetes; Symptom comes from diabetes; Comes from diabetes; Swelling comes from diabetes; Symptom comes from maladjustment to environmental change; Lowering of consciousness comes from liver; Physical symptom of chronic anxiety comes from uncertainty from now on; Fear comes from experience of failure; Stress comes from threatened premature delivery; Spiritual pain comes from loss of existence value
Source domain	"thing" as physical object
Meaning of source domain	Object is moving and coming close to the subject, but the move of the object is not necessarily directed toward the subject.
Target domain	Express causal relationship.

Table 4. Metaphor of distance change cont

“Hanareru”, “Hanasu”

9 kinds

English Translation	Get away
Applied to	One of daughters; Nurse station; Family; Home care; Parents; Home gets away from the clinic; Patient's room; Eyes; Outsider
Source domain	Two objects, or subject and object
Meaning of source domain	Distance between two objects or that between subject and object increases.
Target domain	There is an increase of psychological distance. Connotation that nurse does not expect increase of distance is observed.

“Semaru”

2 kinds

English Translation	Close on
Applied to	Terminal period; Time to start training
Source domain	Two objects, or subject and object
Meaning of source domain	Distance from the object is getting close and the closeness produces stress or pressure to the subject.
Target domain	Important event is going to happen.

Table 5. Metaphor of relationship

“Idaku”

8 kinds

English Translation	Hug
Applied to	Anxiety; Uneasy sense; Spiritual pain; Fear; Feeling; Emotion; Pain; Uneasiness
Source domain	Object of love, or object which is affectionate enough to hold within arms.
Meaning of source domain	Hold object within arms as to hug a baby
Target domain	Emotion held close to a subject.

“Kakaeru”

6 kinds

English Translation	Take in
Applied to	Impairment; Avoidance behavior and conflict; Problems; Anxiety; Anxiety for brain metastasis; Disability
Source domain	"thing" or object
Meaning of source domain	Since object is too heavy to hold by hands. the object is held by hands, arms and part body to resist the weight.
Target domain	To resist against problem. There is a wish to be get away from the object, but responsibility does not allow the subject to disengage.

“Torimodosu”

7 kinds

English Translation	Take back
Applied to	Motivation; Willingness; Memory; Time sense; Life; Rhythm of day and night; Cheerfulness; Calmness
Source domain	"thing" or object
Meaning of source domain	Once object was possessed by subject, but the object was taken away, then subject takes back the object.
Target domain	Take back entity or attribute which was once lost.

Table 5. Metaphor of relationship cont.

“Uketomeru”

24 kinds

English Translation	Take out of
Applied to	What patient openhearted; Expression of emotion; Feeling; Desire; Explanation; Contents of explanation; What openhearted
	Reality as it is; As they are; Only thing to do is to wait; be given up by one's doctor.; It; Patient's death; Process to die; Surgical operation; Happenings; Disability; Situation; Change of condition; Symptom
	Pain; Restlessness and sorrow; Anxiety; Rage
Source domain	"thing" or physical object
Meaning of source domain	Catch and stop physical object coming toward subject with acceleration.
Target domain	Listen to emotional words, accept feeling of client, hear attentively,

“Motsu”

41 kinds

English Translation	Hold by hand
Applied to	Image; Conference; Wish to be cared; Communication; Elbow room; Security feeling; Notions; Conscious mind; Motivation; Impression; Time to spend with patient; Involvement; Interest; Hope; Anamnestic case; Expectation; Opportunity; Time to listen to feeling; Question; Interest; Plan; Regretfulness; Contacts; Confidence; Disability; Concern; Strong character; Eagerness to live; Sense of urgency; Chance to see; Physical capacity; Resistance; History of diabetes; Red flare by reactive hyperemia; Anxiety; Discomfort feeling; Complaint; Chance to talk with husband; Goal; Desire; Dialogue
Source domain	"thing" or physical object
Meaning of source domain	To hold on object by hand which has weight.
Target domain	Possess. Contact level is smaller than idaku.

“Fureru”

2 kinds

English Translation	Touch
Applied to	Topic about photo and music; Patient's eyes
Source domain	"thing" or physical object
Meaning of source domain	Touch object slightly.
Target domain	Involves carefully so that the involvement does not influence characteristics of the object.

Houchi + (suru)”

9 kinds

English Translation	Touch
Applied to	Diabetes; High-blood pressure, Sugar urine; Adhesion of blood; Dry mouth; Polyposia; Excessive urination; Trachyphonia; High level of sugar
Source domain	"thing" as physical object.
Meaning of source domain	Leave a thing without touching.
Target domain	Does not intervene the advances of entity or attribute.

Table 5. Metaphor of relationship cont.

“Tamotsu”

13 kinds

English Translation	Preserve
Applied to	SaO <sub>2</sub> ; Bed rest; Memory; Blood glucose level; Contacts with other patients; Cleanliness of mouth cavity; Width; Body hygiene; Hygiene; Condition of life; decubitus position; Seated position at the edge of bed; healthy skin
Source domain	"thing" as physical object.
Meaning of source domain	Maintain the object without change.
Target domain	Preserve the condition, attribute, characteristics, and entity.

“Ninau”

3 kinds

English Translation	Bear
Applied to	Nursing Care; Coordinating role between patient and other family members; Domestic works
Source domain	"thing" as physical object.
Meaning of source domain	To bear object, which is often heavy, for the sake of others.
Target domain	To reduce load of other person and carry the load instead.

“Katameru”, “Katamaru”

2 kinds

English Translation	Jell, get hard
Applied to	Animus; Decision
Source domain	"thing" as physical object.
Meaning of source domain	To harden object or object naturally hardens
Target domain	To make one's existence immobile

“Mukaeru”

6 kinds

English Translation	Jell, get hard
Applied to	Death; Terminal moment; Day of discharge; Operation; First period; Terminal period
Source domain	Person
Meaning of source domain	Act to greet important person or guest at house gate.
Target domain	Correspond situation which is important with respect.

Table 6. Metaphor of visual perception

“Mieru”

6 kinds

English Translation	Come out, visible
Applied to	Motivation; Direction; Task; Augury of rehabilitation; Context of home care; Attitude to save money
Source domain	"thing" as physical object.
Meaning of source domain	Object is visually identifiable.
Target domain	To identify or to judge substance which is not visible

“Arawareru”

4 kinds

English Translation	Appear, Things, which could not be seen, becomes available to see
Applied to	Pain appears. Effect appears. Physical symptom appears. Trouble in walking appears.
Source domain	visually identifiable “thing”
Meaning of source domain	thing becomes identifiable visually
Target domain	Object, which was not overt object, becomes overt.

“Furikaeru”

12 kinds

English Translation	Look back
Applied to	Past way of being; Diet behavior; Nurse; Path; Own attitude to receive care; Own course of life; Meal contents; Events in life; Life style; Own attitude toward son; Daily physical condition; Diet habit before admission to hospital
Source domain	"human body"
Meaning of source domain	Twist body toward back so that a person will be able to see the back.
Target domain	To evaluate the past events or behavior, or to hark back

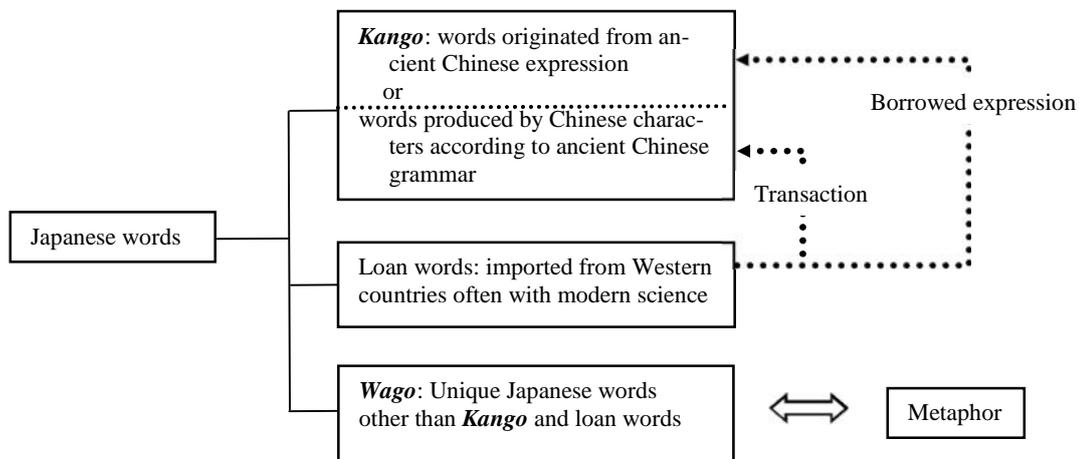


Fig 3. Types of Japanese words

### Three types of Japanese term: Wago, Kango, and Loan word

Three types of Japanese terms, which have different origins, were observed by data sampling (Fig. 3).

- 1) **Wago** **Wago** is a unique Japanese word which has a root in ancient Japanese culture. Words other than Kango and Loan words are classified as Wago. Japanese people tend to express their emotion by the Wago. Connections were observed especially between metaphors and Wago.
- 2) **Kango** **Kango** is a word originated from ancient Chinese term or word produced by Chinese characters according to ancient Chinese grammar. Scientific terms are often expressed by combination of Chinese characters. This is a historical tradition that elites learned and used Chinese expressions for official situations.
- 3) **Loan word** Loan word, which is usually expressed by phonetic sign called Kana, is imported word from Western countries with modern science.

### Characteristics of metaphor by Japanese nurses

**Metaphor and Wago.** This survey revealed strong relationship between metaphor (narrow sense) and **Wago**. **Wago's** such as "Susumu": come on; "Modoru": come back; "Agaru": come up; "Takamaru": rise; "Takameru": up; "Sagaru": come down; "Fueru": mount up; "Heru": go down; "Kuru": come; "Hanareru": get away; "Hanasu": set apart; "Semaru": close on; "Idaku": hug; "Kakaeru": take in; "Torimodosu": take back; "Uketomeru": take out of; "Motsu": have; "Fureru": touch; "Tamotsu": preserve; "Ninai": bear; "Katameru": jell; "Katamaru": get hard; "Mukaeru": salute; "Mieru": Comeout; "Arawareru": appear; "Furikaeru": look back were all **metaphors** (narrow sense).

Metaphors by **Wago** reflect nurse's emotion. "Kaifuku(recovery, noun) no(particle) kibou(hope, noun) wo(particle) idaku(hug, verb) . (Hug hope of recovery)" Nurse "hugs" hope of recovery as if she hugs a beloved baby. If patient dies, a nurse says "Saigo (mortal moment, noun) wo(particle) mukaeru(salute, verb)". "Mukaeru (salute)" is the very best expression for the respect of the course of life of the patient, who was defeated by disease, by nurse as fellow soldier. This is an expression to reward the nurse for her service.

**Metonymy and Kango** Kango's such as "Shinkou+ (suru)": Advance; "Koutai+ (suru)": Regress; "Joushou+(suru): rise; "Koujou+(suru)": goes up; "Teika+ (suru)": Descend; "Kakou+ (suru)": Down; "Zouka+ (suru)": Increase; "Kakudai+ (suru)": expand; "Genshou+ (suru)": Decrease; "Shukushou+ (suru)": Reduce; "Houchi + (suru)": Neglect were used to as metonymies to express physiological condition.

These **Kango's** are considered to be translation of foreign words came with medical knowledge. Traditionally academic words are written by Chinese characters and their parts of speech are noun. Action is expressed by verbal phrase which is composed of noun stem and verbal suffix ("suru") added after the noun. Although "Fujou+ (suru)": levitate was Kango, it was an exception used as metaphor. A few metonymies were observed but they were originally Wago.

**Japanese oral culture and Wago.** There were immigrants from China and Korea in 4th to 7th Centuries when Japan was in oral culture. They brought culture including Chinese characters as writing system with them. Stating of Chinese character as phonogram of Japanese language is estimated from Nara era which is from A.D. 775 (Watanabe,1997). Terms, which have roots in the oral culture before the Nara era, are considered as Wago.

Appendix I summarizes **Wago** and their oldest appearance in historic records including anthology and stories. These records are known for exquisite psychological descriptions of characters, portrayal recognition of scenes, and emotional exchange. Import of Chinese characters as writing system stimulated recording of the oral stories by letters. It is appropriate to think that the most of the records are from folklores as oral stories. To use Wago means to use more than thousand years old semantics and pragmatics which represent subconsciousness of Japanese people.

Sensuous difference of Wago and Kango is indicated (Sanseidou, retrieved 2012/4/22). The Wago has polysemy which extends to behavior and emotion. The Kango, which reduces influences of emotion, is useful for literal expression. Unlike the Kango, Wago is effective to express interpersonal relations and psychological conflict between nurse and patient. It is quite natural that nurses use Wago to bridge between medicine as technology and patient as human, and metaphor, which is composed of Wago, to defuse trajectory of expression in order to communicate with various inner voices of patients.

**Mirror neuron and meaning of word**

“The brain is made up of neurons. In the neural theory of language, neural groups are modeled as “nodes.” Each neuron can function in different neural groups” (Kövecses, 2000). Among these neural groups, special neurons located at Inferior Frontal Cortex and Inferior Parietal Cortex were found by a team of Giacomo Rizzolatti, Giuseppe Di Pellegrino, Luciano Fadiga, Leonardo Fogassi, and Vittorio Gallese (Iacoboni, 2008).

“The same mirror neurons fire when we perform an action and when we see someone else performing that action. Moreover, they are also active when we imagine that we perform or perceive the same action” (Kövecses, *ibid.*). See Fig. 4. “Meaning is mental simulation. What this means is that we activate those neurons that are needed to perform or imagine an action. A node is meaningful when its activation results in the activation of the whole neural simulation. We get inferences when activation of a meaningful node results in the activation of another meaningful node” (Kövecses, 2010). Gallese, et al. (1996) discussed that the mirror neuron system has a role in action recognition and proposed that monkey’s ventral premotor cortex is homologous to the human Broca’s region. Mirror neuron has relationship with language.

Jabbi, Swarta, & Keysers (2007) provided support that mirror system is linked to empathy. If this is true, activation of emotion by metaphor has evidence in brain. Nurses are playing important human work to act upon empathy of patients by using metaphor. There is no reason to take away metaphors from nurses.

A nurse tends to use or prefers to use metaphors while sacrificing semantic strictness, in other words, one-to-one relationship between designator and designatum. There is a mood not to accept metaphorical expression by nurses for polysemy and ambiguity.

Rather it is understood that the nurses are playing important role by the metaphor. Nurse’s metaphor has more effect over patient’s emotion.

**Discussion**

Hyperperistalsis of intestines is often expressed by onomatopoeia “goro-goro” in Japanese. This onomatopoeia is used to represent both a rock rolling over and peal of thunder. There is an analogy between the rock rolling over and internal perception of move of intestinal gas. There is also an analogy between peal of thunder and sound of intestinal gas. A patient may say, “I feel goro-goro at stomach area.” If a nurse replies, “Your intestines have hyperperistalsis”, the patient will feel he/she would be left in a patient room without care. The patient does not want medical diagnosis, but empathy to discomfort at stomach area.

It may not be only a trend in Japan but also in the United States that nurses’ expression is understated. The nurses’ expression is viewed as “complexity and ambiguity within nurses’ conceptualization” (Hartrick & Schreiber, 1998). The complexity and ambiguity of nurses expression have significance. If only literal expression, from which trajectories to emotions and activities are excluded, is used by nurses, ward will become like dessert. The metaphor used by nurses is a vehicle to transport nurses’ wish to care patient and family. Announcement, which is expressed by metaphor by nurse, is not a pronouncement of misery.

For holistic nursing, metaphor is one of major areas of study. The metaphor in nursing had been studied in relation to emotional activities. However, this report revealed that use of metaphorical expressions is not limited to holistic nursing. Rather the metaphors are buried at all over the nursing records. Phil Barker (2001) is critical about health care which became increasingly technical and emotionally distant, and bureaucratic.

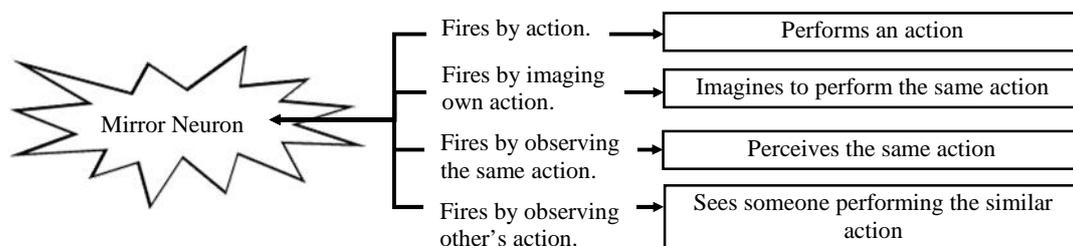


Fig 4. Mechanism of Mirror Neuron

As long as we observe nursing records, we can say it is a needless fear that nurses are getting distant emotionally. Caring attitudes are buried in nurses' metaphorical expressions. Even at a situation when very objective attitude is demanded, nurses insert secret message that they hope recovery of patients. The metaphors by nurses are vehicles to carry message of the hope and caring.

We can share the concerns by Phil Barker (ibid.). Due to excessive insistence over physiological expression to young students, transmission of language conventions, which veteran Japanese nurses developed through 100 years of accumulation of experiences, from veteran generation to younger generation is coming to be difficult. Younger generation, who were reinforced by multiple choice decisions through 12 years of elementary and secondary level education, is not well in making instinctive or fuzzy decision based on accumulation of experiences.

So called qualitative method in nursing is often an escape from advances of modern technology. Certainly it is difficult to represent instinctive or holistic facts by traditional qualitative methods. Nurses' instinctive or fuzzy decision cannot be proven by significance tests. Nurses may go to extremes from the denial of significance tests to qualitative methods. Financial and scientific sides of medicine and nursing cannot be denied. If we deny these sides, we will lose places to speak in medical facilities where there are many stakeholders including insurance agencies and other business organizations. Qualitative methods including phenomenology and other philosophical methods are very useful for model construct or paradigm building. However, evidence based or empirical methods should be deducted from the construct. Otherwise, the public would turn a deaf ear.

Data, which come out from nurses' activity, do not distribute normally. Scales, which nurses use, are often instinctive and distances between divisions of the scales are not even. Problems of significance tests had been criticized already in 1971 by Denton E. Morrison & Ramon E. Henkel's epoch making Significance Test Controversy (2006). Statisticians already shifted from the significance test concept to quantity of information concept such as Akaike's Information Criteria (AIC) (Sakamoto, et.al., 1983).

They had developed many techniques to represent fuzzy or non-normal distributions. Neural network, support vector machine, fuzzy clustering, etc. This research is a by-product of artificial intelligence research in nursing. We propose readers to turn their eyes to new trends in science. It is difficult to express objects which makes delicate changes and is almost impossible to represent 100% well, but efforts must be made to represent the delicate objects in order to survive in a society which is composed of multiple stakeholders.

### **Acknowledgement**

Many suggestions were given from discussions at Kyoto Linguistics Colloquium ([http://www.hi.h.kyoto-u.ac.jp/modules/KLC/index.php?content\\_id=1](http://www.hi.h.kyoto-u.ac.jp/modules/KLC/index.php?content_id=1)). Mr. Keita Komatsubara and Mr. Kaoru Itoh, doctoral candidates of Kyoto University checked metaphors from the point of cognitive linguistics. This research is a by-product of development of nursing ontology, CHARM Convincing Human Action Rationalized Model (Sasajima, M., et.al, 2011; Nishimura, S., et.al., 2011; Nishimura, S. et.al., 2012; Sasajima, M., et.al., 2012) carried out collaboratively with Riichiro Mizoguchi's Laboratory, Institute of Scientific & Industrial Research, Osaka University. Project needed to translate surface vocabulary, which explain behavior of artificial intelligence, into functional vocabulary of ontology. Data were sampled from database of Japanese Nursing Practice Example Accumulation Center Database, (<http://www.kangojirei.jp/index.html>). Authors appreciate above people who involved in the above mentioned projects.

Appendix Wago's used as metaphor and their Oldest Appearance in Historic Records

Term	English	Source	Century
“susumu”	come on	Man'youshuu Anthology <sup>(1)</sup>	7 <sup>th</sup>
“modoru”	come back	Nihonshoki <sup>(2)</sup>	8 <sup>th</sup>
“agaru”	come up	Man'youshuu Anthology	7 <sup>th</sup>
“takamaru”	rise	Man'youshuu Anthology	7 <sup>th</sup>
“takameru”	up	Man'youshuu Anthology	7 <sup>th</sup>
“sagaru”	come down	Man'youshuu Anthology	7 <sup>th</sup>
“fueru(fuyuru)”*	mount up	Bunmei Honsetsu Youshuu <sup>(3)</sup>	15 <sup>th</sup>
“heru”	go down	Genpeishousuiki <sup>(4)</sup>	12 <sup>th</sup>
“kuru”	come	Man'youshuu Anthology	7 <sup>th</sup>
“hanareru”	get away	Man'youshuu Anthology	7 <sup>th</sup>
“hanasu”	set apart	Man'youshuu Anthology	7 <sup>th</sup>
“semaru”	close on	Hokekyou Gensan <sup>(5)</sup>	10 <sup>th</sup>
“idaku”	hug	Ryouiki <sup>(6)</sup>	9 <sup>th</sup>
“kakaeru”	take in	Taketori Story Oral history <sup>(7)</sup>	9 <sup>th</sup>
“torimodosu”	take back	Hokekyou Gensan	10 <sup>th</sup>
“uketomeru”	take out of	Man'youshuu Anthology	7 <sup>th</sup>
“motsu”	have	Man'youshuu Anthology	7 <sup>th</sup>
“fureru”	touch	Man'youshuu Anthology	7 <sup>th</sup>
“tamotsu”	preserve	Genji Story <sup>(8)</sup>	11 <sup>th</sup>
“ninau”	bear	Man'youshuu Anthology	7 <sup>th</sup>
“katameru”	jell	Man'youshuu Anthology	7 <sup>th</sup>
“katamaru”	get hard	Kokinwakashuu Anthology <sup>(9)</sup>	10 <sup>th</sup>
“mukaeru”	salute	Man'youshuu Anthology	7 <sup>th</sup>
“mieru”	come out	Man'youshuu Anthology	7 <sup>th</sup>
“arawareru”	appear	Genji Story	11 <sup>th</sup>
“furikaeru”	look back	Man'youshuu Anthology	7 <sup>th</sup>

\*old pronunciation is “fuyuru”

1. Man'youshuu Anthology: Anthology collected from mid 7th Century to early 8th Century.
2. Nihonshoki History: The oldest history book in Japan.
3. Bunmei Honsetsu Youshuu dictionary: Dictionary of terms.
4. Genpeishgousuiki: History book about war's between Genji and Heike crans
5. Hokekyou Gensan (Nara era): Outline book of Buddhist scriptures
6. Ryouiki is narrative literature. Collection of ghost or bizarre folklores.
7. Taketori Story: Story written in 890's from oral story according to a popular theory
8. Genji Story: The first long story about lives of noble people during the Heian era in Japan
9. Kokinwakashu Anthology: Anthology edited by order of Emperor Daigo by picking up old poems which were not compiled in the Man'youshuu Anthology.

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