Developmental Stages of Chinese Children's Concepts of Health and Illness in Taiwan

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*This research showed that conceptual development of health and illness of Chinese children in Taiwan follows the general pattern of Piaget's levels of development. But Reichenbach's hypotheses of social influence explained the incongruencies in the data. Questionnaire and unstructured interview were used to explore the conceptual development of 468 children who were grouped according to their educational level: kindergarten, first and second grades, third and fourth grades, as well as fifth and sixth grades. Results showed that children in general defined illness and health based on physiological dysfunction. The older school children attributed "inappropriate behaviors" as the cause of illness more than young school children did. Nearly a quarter of the kindergarten group appeared to be at Piaget's level of "phenomenism" when asked to explain the cause of illness. Children also relied on "external resources" as the method to treat illness; younger school children emphasized "medicine treatment". In addition, all children believed "appropriate behaviors" can promote health, but awareness of psychological health did not appear until third and fourth grades (Acta Paed Sin 1993; **35**:27-35).*

Key words: ***Health Concepts, Developmental Stages, Chinese Children in Taiwan***

Because differences in background, social influence and environmental stimuli,[1,2] individuals vary in personal beliefs, approaches to health maintenance, illness avoidance, and treatment methods. Results of a recent study showed that when adults with high blood pressure were given self-care medical information, their knowledge improved and attitudes changed, but after years of habitual practice and beliefs, behaviors remained the same.[3] Therefore, an understanding of the conceptual development of health and illness needs to begin with children. However, children's limited ability to express themselves hinders proper communication. It is up to the responsibility of the public health professionals and pediatricians to understand how children perceive health and illness in order to help them communicate and improve their health.[4]

Thanks to efforts from various health-related professionals in recent years,[5-7] the definition of health is no longer "freedom from illness". The Ancient Greek concept of "body" and "mind" which influence each other is once again the focal point.[8] In 1985 the World Health Organization set up the following definition: "Health is a state of complete physiological, mental, social, behavioral, and psychosocial well-being, and not

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merely the absence of disease or infirmity".[9] The definition not only includes every aspect, but also emphasizes the positivity of being healthy.

From the developmental psychologists' viewpoint, many researchers had already accepted that the children's health concept, like many other concepts, develops in stages.[2] Bibace and Walsh,[2] as well as Flaherty[10] previously used Piaget's theory as a base structure to explain the cause of illness.* Campbell's[11] 1976 study discovered that pre-school children often used vague, unlocalized feeling states to define their illness. Older school children would use specific terms and role alteration. Neuhauser's 1978 study believed that pre-school children (4-5 years-old) used external body cues, while older children (8-9 years-old) used internal body cues to define illness.

The above theories were based on cognitive developmental stages. But Reichenbach[12] had a different point of view. She proposed a framework using "the social cognitive perspective that health is personally defined in relation to an object of emotional attachment". Reichenbach pointed out that individual's development of health beliefs does not necessarily come in stages. Instead, "accommodation", "assimilation", and "empathic understanding" determine such development.

The authors have previously tested, using open questions, children of third to sixth grades on their concepts of health and illness. Most children tend to use physiologically-related explanations and believed that appropriate behaviors can maintain health.[13] However, when applying the Piaget's levels, all the subjects were at the same atage of development (i.e. concrete operational stage); thus, no differentiation could be made and the questions which follow were still unanswered. What is conceptual development of health and illness for Chinese children in Taiwan? And what do they believe causes illness and maintains health? This study included children from kindergarten, first and second grades, combined with findings from previous study to examine whether Taiwan children's health concepts develop in stages.

METHODS

Subjects

A class from each level of a kindergarten and a elementary school in the Taipei area were randomly selected as the subjects of this study. Groups were divided according to Piaget's levels of development: Thirty-five children in the kindergarten group, 79 in the first and second grades, 172 in the third and fourth grades, and 182 in the fifth and sixth grades.

Procedure

Health concepts included narrow and wide definitions. Narrow definitions defined the terms "illness" and "health". Wide definitions included any ideas related to health, cause of illness, concept of body parts, self-evaluation of health status, and knowledge of the medical fields.[14]

The exploratery nature of this study called for a survey that allowed freedom, spontaneity, and creativity. Therefore, the survey utilized Nattapoff's open-ended question method.[15] The questions were in five categories: 1) What do you consider as being "sick"? 2) Why do people get sick? 3) What do you do when you are sick? 4) What do you consider as being "healthy"? 5) What needs to be done to be healthy? The survey was written in both Chinese characters and phonetic alphabet to allow the younger children to understand. The teachers consented to assist with the process of this survey.

The survey was conducted during morning meeting period for elementary school children. Interviewers explained the procedure and asked the children to respond in either Chinese characters or phonetic alphabet.

* appendix 1

* Appendix 1
Piaget's Cognitive Development Theory on Children's Health Concept (2)

	Characteristics	Application to health concepts
SENSORY EXPLANATIONS (birth - 2 years)	Infant uses the five senses to explore the world.	
PREOPERATIONAL EXPLANATION (2 - 7 years)	1. Concreteness, or preoccupaation with external perceptual events. 2. Egocentrism, or viewing the world from one's own perspective. 3. Irreversibility, or the inability to construe processes in reverse.	PHENOMINISM category: the cause of the illness as a source that is spatially remote and inappropriate CONTAGION category: the source of the illness was spatially near the person, not through touching. (Bibace & Walsh, 1980; Perrin & Gerrity, 1980) Cause of illness: contiguous temporal or partial cues. (Blos, 1978)
CONCRETE OPERATIONAL EXPLANATIONS (7 - 11 years)	Learn to differentiate between the self and world, but the focus is still placed on externally visible events.	can use concrete evidence. (Carandang et al, 1979; Simeonsson et al, 1979) disobeying rules is often mentioned (Perrin & Gerrity, 1981) but unable to distinguish location (Bibace & Walsh, 1980) CONTAMINATION category: the cause of illness was through bad behavior or direct contact with the person or genms. Know to avoid contact. (Bibace & Walsh, 1980) INTERNALIZATION category: definition of illness not only includes symptoms but also the source of illness and the roles internal organs play. (Bibace & Walsh, 1980)
FORMAL OPERATIONAL EXPLANATIONS (12 years and older)	Become aware of the gaps in his/her knowledge and fills these gaps with hypotheses. Logical thinking becomes apparent.	PHYSIOLOGICAL category: use dysfunction of the internal body to explain the cause of illness. (Perrin & Gerrity, 1981) PSYCHOPHYSIOLOGICAL category: aware thoughts or feelings affect the way body functions. Multiple reasons can be logically connected. (Carandang et al, 1979)

Children in kindergarten were interviewed one-on-one. The interviewers recorded, categorized, and analyzed the data.

RESULTS

Table 1 presents the responses from all levels of age groups. All age groups used physiological dysfunction to define "sick". The two older groups used "symptoms" such as fever, running nose, stomach ache and coughs; the younger groups used "disease names" such as common cold and asthma to explain sickness. Only 5.6% of the two older groups used "psychologically related" terms ("psychological illness", "mental illness") to define illness. Furthermore, one child from the first and second grade group responded "AIDS" and two responded "Hepatitis B".

When asked to explain the cause of illness, 77.7% of the third to sixth grade children responded: "inappropriate behaviors" such as "exposure to wind and rain", "eat improperly prepared food", and "not wash hands". Close to a quarter of the kindergarten groups used "disease names" and "symptoms" to explain the cause of illness. In addition, the idea of contagion becomes more accurate with increase in age. But in contrast, the older children had lower response rate to the concept "germs" than the younger children.

To treat illness, all four groups of children tended to rely on "outside resources", including visiting the doctor and the hospital and telling parents and teachers. The first and second grade group emphasized "medicine control" and "self control" (drinking water, resting, and eating healthy). Children of age seven and older emphasized the necessity for oral medication.

More than half of all the children used "physiologically-related" terms to define "healthy". A popular response was "free from illness". Many children from the kindergarten and the first and second grade group used "behavior" as a way to define health (28.6% and 43%), such as "exercise is healthy". Furthermore, children who were third grade and older were more likely to used psychologically-related terms to define health than children who were younger. Terms such as "happy and energetic", and "good body and mental conditions" used by the older school children showed a beginning comprehension to mental health. On the other hand, many younger children expressed lack of understanding of the term "health". One fifth of the six-year-old group, and a quarter of the even younger group responded "don't know".

Children from the older three groups believed "appropriate behaviors" can maintain health. "Good eating habits" was the most frequent response, followed by "exercise". In addition, third through sixth graders responded in terms of "physiology", more frequently than the other groups. Other responses could be categorized into "enhancing behaviors" such as brushing teeth everyday and sleeping enough and "avoidable behaviors" such as eating junk food and eating out. Results indicated that as children mature, they would be more likely to use "enhancing behaviors" as the method to maintain health instead of "avoidable behaviors". Twenty percent of the children under the age of six and 15% of the six years-old did not have any ideas about methods of health maintenance.

DISCUSSION

In 1975, Campbell[11] studied 6 to 12-year-old children's concept of illness. He categorized the responses into four levels: "somatic feeling state", "objective illness indication", "specific diagnosis" and "psychosocial illness". Results showed that younger children gave unlocalized and ambiguous descriptions, whereas older children used unusual diseases, change in roles and limitations to define illness. Contrarily, younger children of this study commonly used disease names to define illness, and older children who relied on changing roles and limitations were few. However, the younger children used only

Table 1. Comparison of Health Concepts Among Different Age Groups

Category (in %)	kindergarten	lst & 2nd	3rd & 4th	5th & 6th	X^2
DEFINE ILLNESS					
symptom	37.1	38.0	68.4	63.3	2.61*
name of disease	48.6	32.9	16.4	16.4	5.09*
unhealthy	5.7	24.1	14.7	26.9	8.99*
bacteria and germs	5.7	11.4	0.0	0.6	9.98*
psycalogical	0.0	0.0	8.1	3.3	
others	14.3	6.3			
do not know	2.9	0.0	5.2☆	6.0☆	
CAUSE OF ILLNESS					
inappropriate behavior	48.6 exposed to wind (20.0)	44.4 ate dirty food (20.3)	77.9 cold (40.0)	77.5 cold (30.8)	1.74*
symptom and name	22.9	5.1	1.2	8.8	1.21*
contagion	20.0	30.4	11.6	17.0	1.83*
bodily dysfunction	0.0	1.3	3.5	0.0	
mental factors	0.0	0.0	0.6	0.0	
others	5.7	25.3			
do not know	8.6	3.8	9.3☆	6.0☆	2.96
TREATMENT METHOD					
outside resources	94.3	60.8	88.4	88.4	8.05*
medicine	11.4	46.8	8.7	17.6	5.25*
self-control	5.7	16.5	4.1	15.4	3.28*
others	0.0	2.5	5.8☆	1.6☆	
DEFINE HEALTH					
physiological	60.0	50.6	70.3	57.7	8.28*
(free from illness)	(25.7)	(15.2)	(37.2)	(42.9)	
behavior	28.6	43.0	9.9	5.5	3.06*
psychological	0.0	3.8	19.8	9.9	
psychosomatic	0.0	0.0	0.6	26.4	
others	2.9	6.3			
do not know	22.9	1.3	9.3☆	7.7☆	6.79*
HEALTH MAINTENANCE					
physiological	2.9	3.8	15.7	9.9	4.35*
behavior	71.4	88.6	83.1	87.4	2.87*
(exercise)	(31.4)	(22.8)	(29.1)	(36.3)	
(eating habit)	(34.3)	(53.2)	(57.0)	(46.7)	
(enhanced behavior)	(14.3)	(13.9)	(20.9)	#	
(avoidable behavior) (8.6)	(25.3)	(11.6)	#		
psychological	0.0	0.0	1.7	2.2	
psychosomatic	0.0	0.0	1.2	1.7	
others	8.6	3.8			
do not know	17.1	5.1	4.7☆	2.2☆	9.81*
TOTAL (in number)	35	79	172	182	

\# Insufficient data
☆ Did not respond or responded "don't know"
* $p<0.05$, $df = 3$
Note: Due to low response rate, no Chi-square was performed.

common disease terms such as "a cold", instead of unusual ones, such as "measles". Chinese parents in Taiwan usually use ambiguous, simplified explanations to respond to children's conditions. If a child has a fever and running nose, he or she is said to have a "cold". No explanations are given about internal changes of a human body or mentality, nor is the possibility of other diseases with similar symptoms considered. Furthermore, 34.2% of the seven years-olds used "disease names" as definitions of illness. Three children from that percentage responded "AIDS" and "Hepatitis B", showing that children's reasoning lacks consequence and self-involvement. Their concepts are ambiguous, separate, and prelogical.[4]

The results also showed that, except for one six-year-old who responded "being sick is being flattened by a car because he was not careful crossing the street", no other children considered "accidental injuries" as their response. Similar to Natapoff's study in 1978, no children used accidents as the definition of illness.[15] According to Taiwan's 1990 statistics, 56% of the children who died between the ages of five to nine did so because of accidents. The two categories of causes: "drowning, suffocation, and obstruction of foreign objects" and "automobile accidents" each was the cause of one third of total accidents.[16] According to the United States 1984 statistical records, 50% of the childhood deaths between the ages of one through nine were from accidents.[17] Unquestionably accidental injuries pose a major threat to children's lives. To decrease the number of accidents, an emphasis on their causes and an understanding of one's environment is important in today's health education.

Millstein and Adler[18] tested Campbell's four levels of health concepts, using teenagers as subjects and comparing the results for both children and adults. Results indicated that teenagers' concepts are more closely related to children's, except for responses in the area of "psychosocial". This should remind doctors that when facing a patient, they should not only discuss the disease itself, but also understand the impact of the disease has had on the patient and his/her world.

To explain the cause of illness, Palmer and Lewis reported that older children's usual response is "contact with an ill person or germs". Contrarily, younger children used superficial and external cues. A clear concept of causality appeared to be lacking.[4] Peters,[19] on the other hand, discussed correlation between being sick and self-behaviors as slowly decreasing as children become older. This study selected only the most likely causes of illness; therefore, the results indicated low response on the level of "germs" for the older children. This does not mean a lack of understanding of the disease-causing bacteria. Nevertheless, "inappropriate behaviors" was the number one consideration for the cause of illness. This reflected that Chinese children in Taiwan have prioritized different causes of illness. Furthermore, four children from the seven year-old group (10.5%), three children from the eight year-old group (7.3%) believed "air pollution" is the reason for being sick. This indicates the poor air quality in Taiwan has become a threat to children's health, and that they are aware of.

Children first were taught the concept of disease-causing germs and bacteria in fourth grade,[20] but a low response rate in the corresponding group indicated that these children do not often consider "germs and bacteria" as the cause of illness. Reichenbach previously pointed out that children's development does not always reveal itself in stages; the most important factor in development is "people". Children rely on stimulation of others and naturally select the most appropriate recognition model.[12] The phenomenon of older children in this study using "disobeying rules" to explain being sick could be an influence of people or a cultural endemic; when children are sick, parents limit behaviors, or set rules to guide and discipline them, instead of explaining reasons.

In defining health, Kister & Patterson[21]

pointed out in their 1980 study that younger children have a tendency to inappropriately over-apply instances of contagion. However, 22.9% of the kindergarten children replied "don't know" in defining health. The authors suspect that adults' lack of emphasis on the positive and abstract aspects of health and over-emphasis on the negativity of sickness lead children to be unfamiliar with the term "health". On a psychological level, the two older groups responded significantly higher than the other two, indicating the ability to comprehend abstract ideas and the integration of body and mind. This finding corresponds with Natapoff's[15] study that older children have stronger analytical ability, abstract thinking, and are able to see "part of a whole".

Overall, children-especially the younger ones-have a better concept of "illness" than "health". Younger children's perceptions of disease and health are also global and undifferentiated. But older children are able to comprehend abstract ideas and connect the body and the mind together. This multi-phasic development is congruent with many researchers' findings. However, no children raised the issue of social influence on health.[7,13,22] In other words, well-maintained human relations and proper environmental protection can also maintain and improve health. The possibility of social influence as a stage in development is yet to be explored. On the other hand, the concepts of illness and health found in this study also agree with Reichenbach's hypotheses of social influence. Some examples would be parents' and older relatives' simplified explanations toward illness and older children is belief that to "disobey rules" causes illness.

RECOMMENDATIONS

These results have prompted the following recommendations:

1) Because children's conceptual development of health and illness come in stages, these involved with children should understand levels of development and the uniqueness of each level in order to effectively design teaching strategies which maximize learning.
2) Parents, teachers, and others who work with children should use patience, plus rational, and scientific explanations to answer children's questions related to health and illness.
3) Younger children have vague ideas concerning health. Teachers should provide health-related stimuli and environment to aid proper development of health concepts, placing less emphasis on "ill" than on "well", and how to "be well".
4) Children still only emphasize concepts on the physiological level; to strengthen psychological aspects of development is important. Elementary school health classes touch on this aspect, but mostly on developing good skills in human relations, with not enough emphasis on examining one's own body and emotions.
5) Children's accidental death rate is high. Not only health educators should teach self-protection, but also parents, babysitters and teachers need to contribute to children's self care and awareness of hazards. In addition, the safety of public facilities provided for children needs to be evaluated.

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台灣兒童對健康與疾病的概念之發展

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本研究承襲筆者前一篇研究，進一步將對象擴及至國小低年級及幼稚園幼童，除了欲了解較年幼兒童的疾病和健康概念外，並以之與中、高年級兒童組做一比較，探討一般兒童疾病和健康概念發展的階段性。研究對象是台北市某國小低年級兒童，及該國小附屬幼稚園與某幼稚園幼童，共114人，採開放式問卷進行施測。

研究結果可歸納出下列幾點：

(一) 幼童偏向以「病症」或「病名」來定義生病。

(二) 幼童多以「行為不當」來解釋病因；另外，對傳染的觀念，隨著年齡的增加有更準確的描述。

(三) 幼童多以「藉外力」的方法來處理生病事件，較大兒童(七歲)則特別強調吃藥的必要性。

(四) 幼童多以「生理」層面來定義健康，不過仍有不少幼童表示出對健康一詞的不了解。

(五) 幼童大多認為「適當的行為」可以促進健康，其中又以「飲食」和「運動」最常被提及。

(六) 不同年齡組在健康和疾病概念的比較上發現：

(1)三個年齡層兒童均多以生理層面功能的失常來定義生病，其中中、高年級以「病症」來定義生病為最多，年齡較小者則傾向以「病名」來解釋。另外，中、高年級有5.6%提及「心理」層面的答案，其他年齡較小兩組則無。

(2)在致病因的解釋上，中、高年級組回答「行為不當」方面的答案比低年級和幼稚園組超出甚多；相對地，在「病菌」層面的回答上，中、高年級組比其它年齡較小兩組有偏低的現象。另外，幼稚園組有近1/4以表面的、引用外在線索的「病名、病症」層面來解釋病因。

(3)三組兒童均傾向以「藉外力」的方式來處理生病，低年級組兒童則特別強調「藥物控制」的方式。

(4)在對健康的解釋上，三組兒童均有半數以上由「生理」層面來定義健康，其中又以回答「不生病」的答案最多。幼稚園和低年級組有不少兒童回答「不知道」或以不適當的「行為」方面的答案來定義。另外在「心理」層面的回答，中、高年級組顯著高於年齡較小的另兩組。

(5)三組兒童均認為「適當的行為」可以促進健康，其中「飲食」是最被著重的，其次是運動。另外，中、高年級在「生理」方面的回答顯著高過其他兩組。

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