

# CONTRIBUTION TOWARDS A BETTER TCM TEACHING/LEARNING DIALECTICAL THINKING APPLIED TO “CLINICAL PRACTICE OF TRADITIONAL CHINESE MEDICINE”

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## RESUMO

Este estudo visa contribuir para melhorar o ensino/aprendizagem de Medicina Tradicional Chinesa (MTC) dos estudantes ocidentais e melhorar a sua prática clínica. Pretende ainda encontrar novas ideias para melhorar o processo de aprendizagem dos alunos da ESMTC, usando o conhecimento para transformar a realidade existente em direcção a melhores níveis de equilíbrio dinâmico. A base teórica utilizada foi a dos 24 esquemas dialécticos de Michael Basseches. Foram construídos instrumentos de avaliação para analisar a relação entre os 12 Esquemas de pensamento Dialéctico (DS) associados com a MTC e identificados nos estudantes dos 4º e 5º anos do curso de MTC. Foi utilizada a análise estatística descritiva e a análise de correlação de Spearman, permitindo verificar uma significativa relação entre as competências clínicas avaliadas pelos Chefes de Clínica e os DS presentes na MTC ( $r=0,36$   $p<0,05$ ); competências clínicas agrupadas por áreas e os DS; questões de competência clínica e DS; notas de avaliação e DS.

Os resultados sugerem que a aquisição das estruturas do pensamento dialéctico permite mais sucesso na aprendizagem da MTC e na prática clínica e mostram um grande campo de exploração no ensino da MTC.

**Palavras-passe:** Medicina Tradicional Chinesa, pensamento dialéctico, esquemas dialécticos de pensamento.

## **ABSTRACT**

The purpose of the present study is to contribute to a better teaching/learning of Traditional Chinese Medicine (TCM) to Western students and to improve their clinical practice. It aims at finding new ideas to enlighten the improvement process of the apprenticeship of TCM Lisbon School's students, using knowledge to transform the existing reality towards better levels of dynamic equilibrium. The authors took as theoretical basis the 24 Dialectical Schemata developed by Michael Basseches. Evaluation instruments were built to analyse the relationship between twelve (12) Dialectical thinking Schemata (DS) associated with TCM, manifested by the ESMTC students of fourth/fifth years.

Descriptive statistical analysis and Spearman's correlation analysis were used allowing to verify a significant close relationship between: Clinical competence assessed by Clinical Supervisors and DS present in TCM ( $r=0,36$   $p<0,05$ ); Clinical competence grouped by areas and DS; Clinical competence questions and DS; Discipline marks and DS.

The results suggest that the acquisition of dialectical thinking structures allows people to be more successful in TCM's learning and clinical practice and show a great field to be explored in TCM's teaching.

**Keywords:** Traditional Chinese Medicine, dialectical thinking, dialectical schemata.

## **INTRODUCTION**

It has been since the beginning of the eighties (80's) that, in Portugal, a group of professionals of the non-conventional medicines area put into practice its wish to achieve the recognition and regulation of the then called "alternative medicines".

At the end of 1992, a Portuguese TCM Tuition Centre was created to train qualified TCM practitioners in the Portuguese society, allowing it to fully benefit from this treasure of humanity – TCM. In that initial stage, the reasoning about TCM's tuition, in Portugal, was actually confined to an empirical elaboration of a two years curriculum by simple juxtaposition of subjects considered as important ones, in a more or less randomized way. However since the first course it was evident for us that this kind of approach had very limited results, both qualitative and quantitative, and that preparing TCM specialists was a complex job not compatible with a part time course.

Maturation of dialectic cognitive capacities, namely, took a very long time that could not be artificially shortened: four to five years of daily participation in the dialectical operations of TCM – both “theoretical” and “practical” – was the necessary basis for the *beginning* of acceptable professional capacities in the field of TCM – and in 1998 a five years full-time course was in place.

Two complementary questions were then put forward: on one hand, the necessity to display a professional know-how of quality and, on the other hand, the necessity of ensuring the *cognitive capacities development* of the students, necessary both to grow as technical specialists and as adult human beings. Both capacities should contribute to a socially successful clinical practice.

The purpose of this research aims at finding new ideas to enlighten the improvement process of the apprenticeship of Traditional Chinese Medicine Lisbon School (ESMTC)’s students. That is, to use knowledge to transform the existing reality towards better levels of dynamic equilibrium.

A group of teachers of ESMTC has been giving during years their best attention to the dialectical character of the tasks where Western students usually have greater difficulties:

- Understanding of the dialectical theories of TCM,
- Connecting the theory to the practice,
- Perform adaptation to the process of transformation of the totality of the patient.

## **STUDY OBJECTIVES**

This study attempts to analyze at what level ESMTC students have the skills of the main dialectical thinking operations, and if there is a correlation with their level of learning and clinical competences.

Therefore, we have tested the following hypotheses:

1. There is no relation between the clinical competence of ESMTC school students and the operational use of dialectical structures. (?)
2. There is no relation between the apprenticeship of the TCM basis (Basic Theory and Diagnosis) and the understanding of dialectical structures. (?)

## THEORETICAL RESEARCH

To study TCM and develop the cognitive skills included in its knowledge is important, not only for a TCM school student but also for adult development. To acquire the capacity of post-formal thinking (abstract or formal thinking including dialectic operations) is possible by means of planning teaching methodologies with certain features as have been proved before (Fernandes D., 1994). Accepting the proposal (Arlin, 1975 referred by Lourenço, 2002) of a 5<sup>th</sup> stage of cognitive development, after Piaget's formal thinking stage, and considering the opinion of other eminent experts of adult cognitive development (King & Kitchener, 1981; Kramer, 1983 referred by Lourenço, 2002) the most significant of post-formal thought are:

- Understanding of the **relativist** and not absolute nature of knowledge. - (all is ever changing – principle of change)
- Acceptance of **contradiction** as an essential component of reality. - (principle of contradiction)
- Integration of subsystems in larger totalities or **wholeness**.- (principle of holism)

These are characteristics of dialectical reasoning that have a long tradition in Chinese philosophy as well as in Western philosophy and psychology.

Chinese Medicine is a result of Chinese culture and philosophy. All sciences have the characteristic of being rooted in their own pre-scientific cultural background. This is especially evident at the level of the basic (and necessarily not demonstrated) axioms of any science. And also at the level of the problematic that opens any research: to choose a problem is already to choose a specific kind of answer. And axioms and problems can't be chosen according to scientific demonstration, because they are the necessary foundation previous to any research. They must be chosen according to values: they can't be scientific because of their own nature. But, as values condition axioms, these condition thought: we think differently if we believe that perfection consists on changing, adapting and belonging to larger wholes, or the contrary. From the cognitive perspective, the functional basis of Chinese culture is dialectic. So it is for TCM.

TCM has had a long life. We can question ourselves about its longevity. Is it because it has a dialectic thought as its foundation?

TCM derived from experience and has been continually enriched and expanded through practice, but we can also consider it as a science with a coherent theoretical and systematic body having as a base the presentation of axioms.

In fact, Chinese medical knowledge as a double foundation: it comes from its practice, as any other medical science that readjusts its effects through experience and experimentation; but derives also from the philosophical Chinese thought – mainly the Taoist cosmogonic theory and the binary yin/yang.

These two axioms showed us that the paradigm of TCM is of a dialectic nature in which exists a **holistic** vision and a dynamic relationship of opposition (**contradiction**), complementarity, interaction, reciprocal transformation and alternate growth and decline (**change**).

Concentrating in smaller and smaller parts of the human body, western medicine loses frequently the patient as a whole, reducing health to a mechanic function. Nowadays, biomedical researchers tend to ignore traditional healing, resisting to admit its effectiveness. They forget that medicine is a healing art, in spite of the fact that scientific medicine had its root in a healing art itself only some decades before.

It is not only because of financial problems that western researchers don't develop the knowledge of traditional medicines: it is mostly because they can't understand its root. They don't have dialectical thinking as its thinking style. They have lost it, but human bodies haven't and manifest it in different forms of health problems.

The understanding of any concept or any operative procedure within a formalized theoretical system, like TCM, demands its own examination on the light of the cultural roots that originated its very meaning. To understand TCM we need an operational comprehension of the Chinese culture.

We must enter a new paradigm and understand a new culture which seems very different for us: doing it, we find that quantity has changed in quality, matter into energy, stability into transformation, absolute into relative, Aristotelic and Cartesian logic into dialectics.

Actual Western paradigms and ways of thinking are useless to a better understanding of Qi, yin/yang, heaven /hearth relation, applied dialectic or a pattern oriented thought.

As we aim at spreading TCM, we must think about the way we shall transmit it. People must understand its foundation; consequently they must know how to use dialectical thinking and they will discover their own roots of healing.

In this theoretical research the authors realized that there was not any known research study on the subject, one possible reason being the difficulty of measuring the dialectical reasoning. Meanwhile, this is a vital question in the actual TCM teaching/ learning process.

Basseches, a developmental psychologist, and a worldwide reference in the study of dialectical thinking, was able to identify and to measure 24 different manifestations of dialectical thinking in a semi structured interview with open questions related with educational subjects, among others in a random sample of 27 participants (freshmen, seniors and faculty members of Swarthmore College, USA). The 24 Dialectical Schemata (DS) framework, as they are called by Basseches (Lourenço, 2002) constitute a proof of pos-formal thought (Benack & Basseches,1989; Irwin & Sheese, 1989 referred by Lourenço, 2002).

**Table 1. The Dialectical Schemata Framework**

<b>DS</b>	<b><i>Dialectical Schemata</i></b>
<b>A - Motion-oriented schemata</b>	
1	Thesis-antithesis-synthesis movement in thought
2	Affirmation of the primacy of motion
3	Recognition and description of thesis-antithesis-synthesis movement
4	Recognition of correlativity of a thing and its other
5	Recognition of ongoing interaction as a source of movement
6	Affirmation of the practical or active character of knowledge
7	Avoidance or exposure of objectification, hypostatization, and reification
8	Understanding events or situations as moments (of development) of a process
<b>B Form oriented-schemata</b>	
9	Location of an element or phenomenon within the whole(s) of which it is a part
10	Description of a whole (system, form) in structural, functional, or equilibrational terms
11	Assumption of contextual relativism
<b>C Relationship-oriented schemata</b>	
12	Assertion of the existence of relations, the limits of separation or the value of relatedness
13	Criticism of multiplicity, subjectivism, and pluralism
14	Description of a two-way reciprocal relationship
15	Assertion of internal relations
<b>D Meta-formal schemata</b>	
16	Location (or description of the process of emergence) of contradictions or sources of disequilibrium within a system (form) or between a system (form) and external forces or elements which are antithetical to the system's (form's) structure
17	Understanding the resolution of disequilibrium or contradiction in terms of a notion of transformation in developmental direction
18	Relating value to (a) movement in developmental direction and/or (b) stability through developmental movement
19	Evaluative comparison of forms (systems)
20	Attention to problems of coordinating systems (forms) in relation
21	Description of open self-transforming systems
22	Description of qualitative change as a result of quantitative change within a form
23	Criticism of formalism based on the interdependence of form and content
24	Multiplication of perspectives as a concreteness-preserving approach to inclusiveness

(From Basseches, 1980, p. 408.)

According to Basseches the Dialectical Schemata (DS) framework consists of 24 patterned movements in thought, each of which playing a role in dialectical thinking. They are grouped into four schemata categories motion-oriented, form-oriented, relationship-oriented and meta-formal (Table 1). Although the schemata were derived from dialectical forms of thought, once derived, the 24 elements of the DS framework take on lives of their own. *“Each describes a kind of move which may be identified in an individual’s thinking, either separate from, or conjoined with, other elements of*

*dialectical thinking. Whereas what makes thinking dialectical is the coordination of these 24 elements into an organized whole, tied together by the concept of dialectic, each of the elements may, by itself, prove to be useful for the task of interpreting mature thought.” (Basseches, 1980)*

In our research one of our tasks is to identify and evaluate the actual situation of the web of dialectical factors and relationships that constitute the teaching/learning process of ESMTTC. The analysis is focused in the learning of TCM general theories and in two critical areas of confluence of theory and practice:

1.a) The teaching unit “Basic TCM Theories”, belonging to the 1<sup>st</sup> year of the TCM Course. Dialectical cognitive operations are heavily involved in this learning, as most of these theories have a clear dialectical character.

1.b) Three annual teaching units, “Diagnosis” I, II and III , respectively belonging to the first, second and third year of the TCM course. This is a privileged analysis area, where students must learn the cognitive dialectical operations necessary to apply TCM general dialectical theories to particular clinical conditions

2) The system of controlled clinical practice of 4<sup>th</sup> and 5<sup>th</sup> year students, where the TCM theories’ apprenticeship fully meet their actual conditions of operationalization. This is, in fact, the field where the teaching quality becomes evident and the actual level of practical effectiveness of the students becomes obvious. Many connections irradiate from this privileged focus, towards the teaching system of the college, the patients and their environment, the students themselves and the teachers involved in this process.

## **EXPERIMENTAL RESEARCH**

### ***Sample***

The sample is composed of 32 college students junior doctors, 17 from the fourth college year, 15 from the fifth college year, 10 males (mean age  $31,50 \pm 7,38$  years) and 22 females (mean age  $31,91 \pm 10,07$  years) with the mean age group of  $31 \pm 9,20$  years. The sample was selected from all (35) the college students that attend the fourth and fifth years of ESMTC in 2005/2006 and simultaneously participate in the clinical practice system for junior doctors.

### **Experimental design**

This is an observational and transversal study case where we analyze the relationship between twelve (12) Dialectical thinking Schemata (DS) associated with TCM and life in general, manifested by the students of the fourth/fifth years assessed by two different questionnaires and:

1. their clinical competence divided into five main fields of TCM practice, assessed by questionnaire answered by the student and by different responsible teachers ;
2. their clinical competence discriminated in 25 questions, assessed by questionnaire answered by the student and by different responsible teachers;
3. their marks obtained in the disciplines of Diagnosis I, II, III and TCM Basic Theory given by different teachers.

The measure is based on two main assumptions:

1<sup>st</sup> - if a person has achieved a particular level of cognitive organization, then he or she will be more likely to understand and express reasoning associated with that level of organization (Rest, 1973 referred by Basseches, 1984) and to manifest it.

2<sup>nd</sup> - It is also pointed by literature, but not yet proved, that the development of dialectical thinking will probably improve diagnosis and clinical practice capacity of TCM school students.

### ***Validation Concept***

The validation of all the questionnaires is based in the assumption defended by Messick (1989) and in the evaluation process proposed by Moreira, J.M. (2004), i.e. test different relations, supposed by the theoretical framework in which the construct is based, between the different measures found in the analysis and other measures of the same or other instruments.

### ***Treatment instruments***

A *Clinical Competence's Questionnaire* was constructed by the authors according to their clinical experience and to the professional experience of Portuguese and Western TCM practitioners. Twenty five questions were chosen criteriously according to the dialectical operational functions presented, from the most answered questions of a very detailed professional profile questionnaire presented to a reference group of 42 professional TCM acupuncturists. The questionnaire was reviewed by a group of three TCM professionals that have examined the comprehension of the questions, their adjustment to clinical practice, and the content related with the clinical competence (theoretical construct of TCM) and the process of dialectical thinking (theoretical construct of the Schemata of the Dialectical Thinking) after a preliminary study. At last the questionnaire was applied to the students of the 4th, 5th year (self-assessment) to the Clinical supervisors, and to the Clinical Reviser (person that reviews the clinical reports of the students).

### ***Dialectical Thinking Questionnaires***

There are two Questionnaires used in the present study that were constructed by the authors according to Basseches's (1984) model of dialectical thinking.

In order to choose the adequate questions was used the interview and group discussion methods with experts of the field (Basseches, philosophic, educational and TCM experts). To verify the accuracy of the Questionnaires was made a preliminary study with 33 school students of ESMTC of other year and the two questionnaires were reviewed by a group of experts and applied to the students of the 4th, 5th year.

## EXPERIMENTAL RESULTS AND DISCUSSION

### *Clinical Competence's Questionnaire*

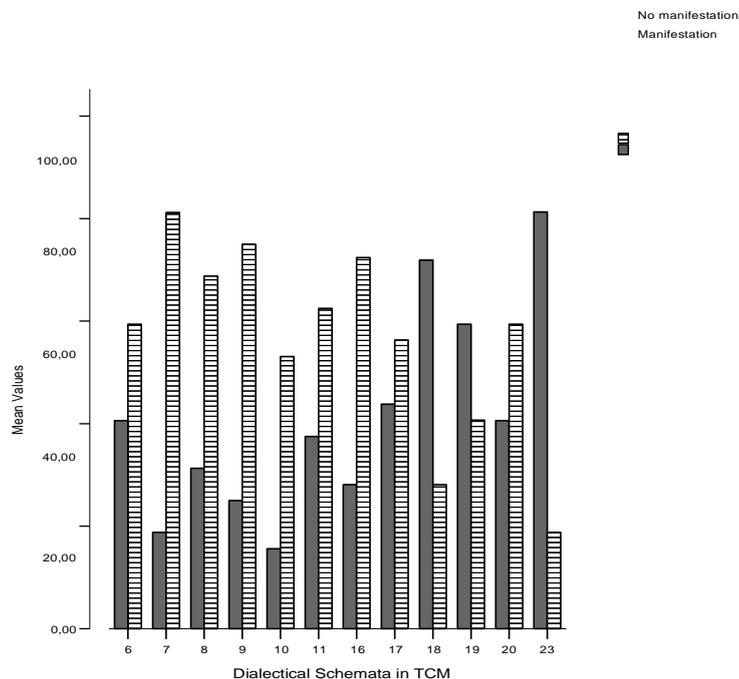
The mean and standard deviation values assessed by the school students and supervisors are  $3,99 \pm 0,40$  and  $3,52 \pm 0,45$ , respectively. The Spearman's correlation shows no close relationship between these two variables ( $r = -0,16$   $p = 0,40$ ). As can be observed there is a tendency to an inverse correlation between these two variables which eventually means that some students have a tendency to over-estimated their competence levels compared to their clinical supervisors.

### *Dialectical Comprehension Questionnaire*

Seventy one percent (71, 88%) of the college students have chosen the dialectical text (B). The mean and standard deviation level values of the variable text A, B and C are  $1,25 \pm 0,44$ ;  $4,22 \pm 0,75$  and  $3,09 \pm 0,78$ , respectively.

### *Dialectical Thinking Schemata Questionnaire"*

The variable mean dialectical schemata for TCM and the variable mean dialectical schemata in general present the mean and standard deviation level values  $1,98 \pm 0,51$  and  $1,87 \pm 0,50$ , respectively.

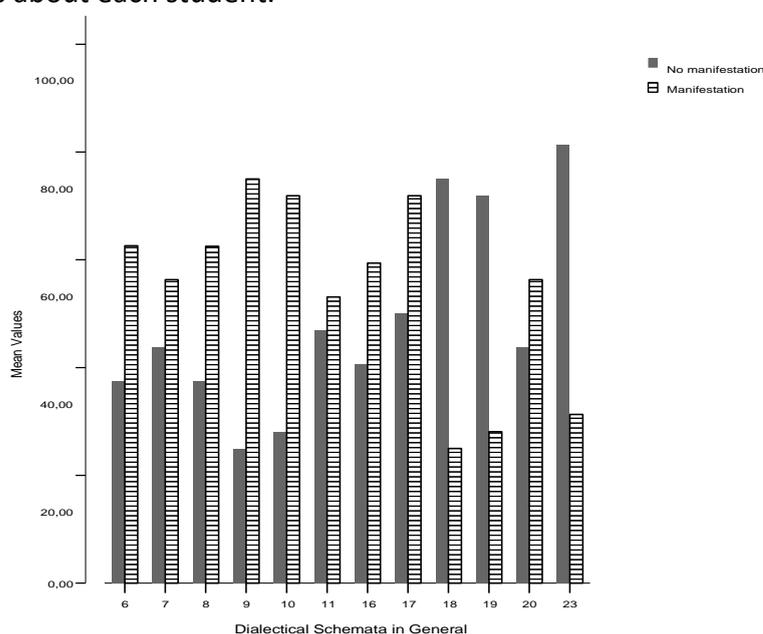


**Fig. 1 – No manifestation and Manifestation (partial and clear) percent mean values of TCM Schemata in school students**

As we see in *Fig 1* the manifestation of the variable TCM examples for dialectical thinking schemata (DS) in the school sample was higher than **50%**. However, it was possible to verify a deficit of schemata 18, 19 and 23 considered by us important to the TCM clinical practice. A similar manifestation of the variable general examples for DS can be observed in *Fig 2* with relative percentage differences.

### *Clinical reviewer*

The answers to the clinical competence questionnaire assessed by the clinical reviewer can't be correlated with the others because he didn't answer to all and to the some questions about each student.



**Fig 2. – No manifestation and Manifestation (partial and clear) percent mean values of TCM Schemata in college students**

### *Clinical Competence and Dialectical thinking*

The correlation analysis of Spearman allow to verify that there is a significant close relationship between the variable mean clinical competence assessed by the Clinical Supervisors and the variable mean DS for TCM examples ( $r = 0,36$   $p < 0,05$ ).

### *Clinical Competences grouped by areas and Dialectical Schemata*

The Spearman's correlation between Clinical Competences grouped by areas and Dialectical Schemata allows verifying that there is a significant close relationship between some clinical areas and DS presented in Table 2.

**Table 2 - Spearman's rho values and levels of significance for the relation between clinical competence grouped by areas and dialectical schemata**

	1.Patient's condition diagnosis <i>Questions</i> <u>1-10</u>	2.Determination of treatment <i>Questions</i> <u>11-13</u>	3.Observation modification treatment <i>Questions</i> <u>14-15</u>	4.Professional relationship <i>Questions</i> <u>16-20</u>	5.Knowing how to be <i>Questions</i> <u>21-25</u>
DS6 TCM					r=0,37*
DS6 Gen.					
DS8 TCM	r=0,39*		r=0,35*		r=0,44*
DS8 Gen.					
DS9 TCM	r=0,37*				
DS9 Gen.				r=-0,35*	
DS10 Gen.	r=0,49**	r=0,51**	r=0,51**		r=0,42*
DS11 TCM	r=0,42*				
DS11 Gen.	r=0,35*				
DS16 TCM	r=0,39*	r=0,35*	r=0,35*		

\*p<0,05 - Level of significance

\*\* p<0,01 - Level of significance

## *Clinical Competences grouped by areas and Dialectical Schemata*

1. *Area - Patient's condition diagnosis; Questions 1-10 and TCM DS8; TCM DS9; Gen. DS 10; TCM DS11; Gen. DS11, TCM DS16.*

The correlation analyses showed that there is a relation between the Clinical Competence of the students assessed by the Clinical Supervisors namely the Diagnose of Patient condition, specially the Inquiry, and the TCM DS8, DS9, DS11 e DS16 and a Gen. DS10 and DS11.

This relation points out that only by inquiry can a TCM practitioner know the symptoms, onset, progress and duration of an illness and the past history. Informations gathered from inquiry may serve as clues to make an accurate diagnostic. In this process the junior doctor must recognize that illness is a moment of a process (DS8) and he has to contextualize the symptoms in the context of the theories (DS9) that allow him understanding their significance.

But, to be successful in this operation, he must be familiar with the idea that the meaning of any sign may change according to the context where it is integrated. For example, the different possible meanings of a pale tongue (may be Qi Deficiency, Blood Deficiency, Yang deficiency) shows that it is necessary to insert this signal in the context of a whole of signals and symptoms in order to validate its actual meaning and a certain general syndrome (DS11).

To be able to describe a system in structural, functional and equilibrational way is very important to TCM clinical practice (DS10). For example, to understand the structure of Zang Fu, their functions of mutual generation and control and the actual conditions of their equilibrium; or to understand all the significant components of the global patient's condition, the actual functions of their mutual interactions and the equilibrational conditions necessary to recover their global balance.

The practitioner must do a correct evaluation of the evolved pathologies to do a correct diagnosis. For this purpose DS16 is of central importance, as it is revealed by its significant correlation: *"Location of contradictions or sources of disequilibrium within a system (this is the basic theoretical model for all cases of internal pathogenesis) or between a system and external forces or elements which are antithetical to the system's structure (the basic model for all external pathogenesis)"* (Basseches, 1984).

Therefore, the junior doctor must show the capacity to go further and orientate the search for signs necessary for the true conclusion of the diagnosis. Without these capacities of dialectical thinking junior doctor's school students are not able to prosecute to the other clinical competences.

*2. Area – Determination of treatment - Question 11-13 - and Gen. DS10 ( $p < 0,01$ ); TCM DS16;*

The correlation showed a significant presence of DS10, confirming its importance as a basis for general clinical competences of the junior doctor's college.

It is also noted a significant relation between this area and DS16. As well as the practitioner must perform a correct evaluation of the evolved pathologies to reach the patient's diagnosis they also must do the same for the adoption of a therapeutic strategy.

The presence of DS16 in this area is very important but unfortunately is not enough.

In the presence of combined syndromes, for example, the junior doctor must not only locate the sources of disequilibrium. He must also adopt a therapeutic strategy, taking into full consideration the complexity of the circumstances, *ex .:* facing a situation of Qi Deficiency and pathogenic invasion of wind-heat, the pathogenesis of both syndromes have contradictory aspects without relation or complementarity between them. He must decide: first to clarify the external pathogenic factor and only then invigorating the Qi; to do the contrary; or to do both at the same time. These operations are absent from DS16. To successfully determine the treatment of the patient we need the operations involved in DS17, DS19 and DS20 that don't present significant relation in this area. This statistical result may show the relevance of this evaluation instrument as a pedagogical tool, insofar as it calls the attention of teachers and clinical supervisors to the necessity of reinforcing the operations related to these absent DS in this area.

*3. Area - Observation and modification of treatment - Questions 14-15 – and TCM DS8; Gen. DS10 ( $p < 0,01$ ); TCM DS16.*

This area consists in repeating the process of patient evaluation and deciding the therapeutic strategy as in the 2<sup>nd</sup> area but changing the criteria according to the evolution and present situation of the patient.

The statistical results seem to confirm this by the relevant relation of DS10 and DS16, previously found in the 2<sup>nd</sup> area, and this 3<sup>rd</sup> area.

The specific difference of the 3<sup>rd</sup> area in relation to the 2<sup>nd</sup> area – changing criteria according to patient's evolution – is demonstrated by the presence of DS8. It illustrates the necessity to understand situations as a moment of a process.

#### *4. Area – Professional relationship – Questions 16-20 – and Gen. DS9*

Professional relationship area focuses on the quality of the relationships that the junior doctor establishes with clinical supervisors, colleagues, patients and ... all people around him.

It is not surprising to find out that the DS9 has a relation with this area. In fact, "*Location of an element or phenomenon within the whole(s) of which it is a part*" (Basseches, 1984) can easily be accepted as a good description of the basic operation that underlies the capacity to regulate one's behaviour, considered as a part, according to the common necessities, considered as a whole. Correctly locating oneself in the functional whole of a clinical working team and to communicate with patients according to their specific necessities seems to translate into practice DS9.

The low general correlation level found in this area is also not surprising. Social relationships are not always easy to define, and the pressure of technical matters in clinical practice can drive attention away from it: it is possible that clinical supervisors feel more comfortable evaluating the technical clinical competences of their students than professional relationships.

#### *5. Knowing how to be, knowing how to do – Question 21-25 – and TCM DS6; TCM DS8; Gen. DS10 ( $p < 0,01$ )*

This area, more than the other areas aims at global developmental picture of the student himself. Questions of self-awareness, self-government and openness to change are primordial here. In a certain way we could say that this area is more focused in what the student is than in what he does. But is there a relation between what one is and what one does in the field of TCM?

The fact is that the two of the three schemata with a stronger presence in this study

remain the dominant schemata in this area: *"Understanding events or situations as moments (of development) of a process"*(DS8) and *"Description of a whole (system, form) in structural, functional, or equilibrational terms"*(DS10) (Basseches,1984).

This could mean that the main cognitive capacities necessary to be a dialectically mature person are the same needed to practice ... TCM.

From this point of view inferences become very rich and inspiring. Is TCM a medical system made for human being as he is supposed to be? To be a good TCM specialist relies on the same foundations for being a mature human being? Is TCM related to human cognitive development?

The 5<sup>th</sup> area supposes a motivation, a dynamic tension aiming at getting better, at self-improvement. The Spearman's correlation of DS6 and this area confirms and explains it: trying to become a TCM doctor implies a hard struggle motivated by the aim of translating knowledge into actual and effective clinical practice; and this process deeply transforms the person itself.

#### *Twenty five clinical competences questions and Dialectical Schemata*

The Spearman's correlation between each 25 Clinical Competences and Dialectical Schemata allows verifying that there is a significant close relationship between some of this variables that are presented in Table 3. In spite of others, the most important aspects outlined by these correlations have been pointed before.

**Table 3 - Spearman's rho values and levels of significance for the relation between clinical competence questions and dialectical schemata (Schemata 6-7-8-9-10)**

	<b>DS6 Gen.</b>	<b>DS7 TCM</b>	<b>DS7 Gen.</b>	<b>DS8 TCM</b>	<b>DS8 Gen.</b>	<b>DS9 TCM</b>	<b>DS10 TCM</b>	<b>DS10 Gen.</b>
<b>1</b>				r=0,38*		r=0,45*	<b>r=0,60**</b>	r=0,41*
<b>3</b>		r=,37*					r=0,42*	
<b>6</b>	<b>r=0,42**</b>	<b>r=0,67**</b>	r=0,37*	<b>r=0,48**</b>	r=0,42**			
<b>7</b>				<b>r=0,56**</b>				
<b>8</b>	r=0,38*	<b>r=0,46**</b>		<b>r=0,45**</b>	r=0,38*			<b>r=0,50**</b>
<b>9</b>		r=0,39*		<b>r=0,54**</b>		<b>r=0,46**</b>		<b>r=0,59**</b>
<b>10</b>				r=0,36*				r=0,39*
<b>12</b>		r=0,37*						
<b>13</b>		r=0,37*					r=0,42*	
<b>15</b>				r=0,36*				
<b>21</b>							r=0,42*	
<b>23</b>				r=0,38*				
<b>25</b>		<b>r=0,55**</b>	r=0,43*	r=0,36*				

\*p<0,05 - Level of significance

\*\* p<0,01 - Level of significance

**Table 3 (cont.) - Spearman's rho values and levels of significance for the relation between clinical competence questions and dialectical schemata (Schemata 16-17-18-20-23)**

	<b>DS16 TCM</b>	<b>DS17 Gen.</b>	<b>DS18 TCM</b>	<b>DS18 Gen.</b>	<b>DS20 Gen.</b>	<b>DS23 TCM</b>	<b>DS23 Gen.</b>
<b>7</b>	r=0,39*						
<b>9</b>					r=0,38*		
<b>10</b>		R=-0,38*					
<b>11</b>			r=-0,41*	r=-0,45*		<b>r=-0,54**</b>	r=-0,38*
<b>25</b>	r=0,39*						

\*p<0,05 - Level of significance

\*\* p<0,01 - Level of significance

## DISCIPLINE MARKS AND DIALECTICAL SCHEMATA

The Spearman's correlation between discipline marks and Dialectical Schemata allows verifying that there is a significant close relationship between some of this variables that are presented in Table 4 and discussed afterwards.

**Table 4 - Spearman's rho values and levels of significance for the relation between discipline marks and dialectical schemata and mean TCM Schemata values and TCM mean sum values schemata**

	Diagnosis I	Diagnosis II	Diagnosis III	Basic Theory
Diagnosis I		r=0,35*	<b>r=0,47**</b>	<b>r=0,64**</b>
Diagnosis II	r=0,35*		<b>r=0,53**</b>	r=0,36*
Diagnosis III	<b>r=0,47**</b>	<b>r=0,53**</b>		r=0,43*
Basic Theory	<b>r=0,64**</b>	r=0,36*	r=0,43*	
DS6 Gen.		<b>r=0,52**</b>		
DS10 TCM		r=0,38*		
DS11 Gen.		r=0,37*		<b>r=0,48**</b>
DS17 Gen.	r=0,43*	r=0,42*		
DS18 TCM		r=0,41*		
DS23 TCM	r=0,37*			
TCMMDS*		r=0,43*		
MCIPr*		r=0,43	r=0,40*	

\*p<0,05 - Level of significance; \*\* p<0,01 - Level of significance

\*TCMMDS – mean TCM dialectical schemata; \*MCIPr – Mean Clinical Practice

### *Discipline marks and Dialectical Schemata*

We have chosen four disciplines (*TCM Basic Theory and Diagnosis I, II, III*) of the curriculum of ESMTTC because they are the principal TCM basis and an important part of its dialectical essence. To understand these disciplines may signify to understand dialectical operations if we consider its readiness for clinical application. So we tried to do Spearman's rho values and levels of significance for the relation between discipline marks and dialectical schemata (DS) and mean TCM DS values and Mean Clinical Practice (Table 4).

*TCM Basic Theory (TCM BT) – and Gen. DS 11 (p<0,01).*

The significant correlation between TCM BT and DS11 can be well understood if we perceive that DS11 (*assumption of contextual relativism*) presupposes the acquisition of: *motion-oriented DS* that “draw the attention of the thinker to processes of change, or to describe such processes”, implying “fluidity in thought” and transformation; *form-oriented DS* those that draw the attention of the thinker to emphasize change (transformation) and wholeness. Their function is “(a) to direct the thinker’s attention to organized or patterned wholes (forms) and (b) to enable the thinker to recognize and describe such forms.” (Basseches, 1984).

“Processes of change” or “organized or patterned wholes” are some of the main characteristics of the new theories the students must face for the first time in TCM BT.

In DS11 the thinker has the ability “of understanding the nature of knowledge in such a way that leads one to locate ideas in their contexts (DS9) and to attempt to understand the organization of their contexts as wholes (DS10). Thus the assumption of contextual relativism creates the demand for locating a phenomenon in the context of a larger whole and for describing that whole in structural, functional or equilibrational terms, and if the meaning, value or truth value of an idea is relative to its context, one must be conscious of the context to appreciate it.” (Basseches, 1984, Att. 2). This ability is critical in the change from Western culture to TCM view of the world lived by the first year students. In the 1<sup>st</sup> year of TCM course, discovery of such new and different subjects, like those of TCM BT, is easier if students have the strong operational idea that the meaning of any concept depends on the context it belongs to (DS11).

**Diagnosis I** - and Gen. DS17, TCM DS23.

The significant rho value between Diagnosis I (a discipline of the 1<sup>st</sup> year TCM course) and DS17 (“Understanding the resolution of disequilibrium or contradiction in terms of a notion of transformation in developmental direction”) and DS23 (“Criticism of formalism based on the interdependence of form and content”) must be understood if we pay attention to group category they belong - meta-formal schemata - “play the

*role of integrating the categories of relationship and motion with the category of system” and “enable the thinker to recognize systems as objects of thought”.* These schemata *“presuppose recognitions of systems.”*

Diagnosis I, in spite of constant references to practical situations is, in fact, mostly a theoretical field, in which even the resolution of didactic clinical cases doesn't come out from the mind of the student. We may consider that its main activity is the abstract apprenticeship of a method of heavy mental calculation that later will be displayed with the real patient.

This perspective of Diagnosis I immediately shows the importance for 1<sup>st</sup> year students of the level of maturity of meta-formal schemata to learn this subject: the field of the calculation is strictly abstract (*“to recognize systems as objects of thought”*); the mental operations displayed during the calculation must be intense, full of motion and actively searching many possible directions and connections (*“integrating the categories of relationship and motion with the category of system”*); the complete set of theories and methods integrating TCM diagnosis must be understood as a single, coherent conceptual system (*“presuppose recognitions of systems”*).

**Diagnosis II – and Gen. DS6 (p<0,01); TCM DS10; Gen. DS11; Gen. DS17; TCM DS18; TCMMDS; MCIPr.**

The dispersions of correlation results in Diagnosis II makes its analysis very complex with a puzzling difficulty to coordinate all the possible inferences. Anyway the presence of these multiple correlations asserts in general the connection between TCM apprenticeship and dialectic schemata.

**Diagnosis III – and MCIPr (mean clinical competence assessed by clinical supervisors)**

Diagnosis III is a discipline with a close relationship with clinical practice. The teacher must critically prepare the school students to the diagnosis clinical competences they will start performing in real situations in the next year, as their main activity in the clinical practice of the fourth year. During a year students must be intensely trained

on analysing clinical cases, with few new theories to learn. Probably this explains the above correlation.

## **CONCLUSIONS**

### *General Schemata appreciation:*

The most significant correlation, that of DS10 (*“description of a whole (system, form) in structural, functional, or equilibrational terms”*; (Basseches, 1984) results from being the first of the chosen schemata that allows a mental construction of a complete model of reality. In fact, all the previous schemata are elements, functions, attitudes and cognitive operations necessary to build models of reality. But by themselves are not enough for this purpose: to affirm the practical character of the knowledge (DS6), avoid objectification (DS7), understand events as moments of a process (DS8), to localize events in a whole (DS9) are necessary to build dialectical models of reality but are not yet the model itself. The presence of a complete self-consistent model only comes up at the level of DS10.

On the other hand this DS10 is required as a basis for all the following chosen DS (DS11, 16, 17, 18, 19, 20, 23), which are related to cognitive operations within whole systems or between systems previously defined: contextual relativism of an isolated factor in relation to the whole it belongs ( DS11); location of factors that unbalance a specific system (DS16); resolute transformation of disequilibrium inside systems (DS17); relating values to balanced development or stability inside a system (DS18); evaluative comparison of systems (DS19); systems coordination (DS20); adapting theoretical systems to changes of actual contents (DS23).

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