Construction of MIDSCO Intelligence Theory and its Theoretical and Empirical Test

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Abstract: Based on the intention to integrate the split and fragmentation of intelligence researches, a multiple integrative dynamic system circular openness (MIDSCO) paradigm is suggested, which can function as a meta-theory principle guiding theory construction, then, a corresponding MIDSCO-i intelligence theory is constructed, besides, a set of meta-theory criteria to justify a theory before any empirical test is administered are also established. MIDSCO-i intelligence theory is a systematic construct with five serial models in it, built up on the cognitive representation and cognitive process level, which can uniformly explain conflicting intelligence phenomena and integrate different intelligence theories. After that, the MIDSCO-i model is also demonstrated through both the theoretical verification and empirical testification. With regard of the theoretical verification approach, six meta-theory test criteria are set up and employed, and all these six pure theoretical test principles can be fit well by the MIDSCO-i model. As for the empirical test method, two logistic regression models are applied to gain a convergent confirmation, and the null hypothesis predicted from the MIDSCO-i is empirically testified. MIDSCO is initially supposed as a meta-theory paradigm to construct a systematical theory which can integrate the split and fragmentation situation in intelligence researches, theoretical and empirical test results show the corresponding MIDSCO-i intelligence model functions well.

Key words: IQ, EQ, intelligence theory; meta-psychology theory; MIDSCO; intelligence vectorization; hot knowledge, psychology integration.

0　Introduction

Nowadays, one of the largest problems faced with psychology research is the crisis of split and fragmentation, which manifests itself in every sub-field of psychology, as well as in the intelligence field. Intelligence research is usually divided into two main areas, the first one is the intelligence structure, mechanism and IQ measure area, the second one is the intelligence differentiation area. Intelligent structure and mechanism area normally deals with structure and mechanism theories in the hope to find out the components of the intelligence and their structural and mechanism relationship, and then, if possible, measure it. Intelligence differentiation area generally copes with the intelligence differentiation phenomena, including cognitive differentiation, age differentiation and personality differentiation, in the hope to find out the laws of the different intelligence differentiation phenomena. These two areas have always seemed to be totally different areas, studies in each area go along different ways, and no connection can be found between these two areas, rendering these two areas a fragmentation situation. As for the inside of each area itself, it seems that there are also no connections that can be found between different theories in each area. For example, in the intelligence structure area, a great number of theories have been proposed by different researchers up to now, such as the Spearman's (1904) [1] [2] [3] two-factor model, Cattell's (1963) [1] [2] [3] [4] crystal and fluid intelligence doctrine, Thurstone's (1938)[1] [2] [3] seven-factor intelligence models and Gardner's (1983)[1] [2] [3] multiple intelligence theory, Eysenck (1953)[1] [2] [3] and Guilford's (1959)[1] [2] [3] three-dimension theories, Thorndike's[1] [2] [3] three-factor theory, as well as Das et al's (1990)[1] [2] cognitive psychological PASS model (Planning-Attention-Simultaneous-Successive Processing model) and Sternberg's[5]

(1985) triarchic intelligent theory etc. Although so many structural theories have been suggested, seldom can connections be found among them, leaving a split and fragmentation situation in this sub-field. Regarding the intelligence differentiation area, there are also many models that can be employed to explain the intelligence differentiation phenomena. Spearman come up with an energy-engine metaphor model in 1927, Sternberg supposed an economic investment metaphor theory in 1991, Anderson suggested a model with basic process mechanism and specific processors in 1992. All these theories can be employed to partly explain the intelligence differentiation phenomena, although their explanations are not thorough and complete, and again, no associations can be found among these models, and a split and fragmentation situation is left there. Particularly, all theories in both areas are not complete and thorough, and, cannot perfectly and thoroughly explain their target phenomena.

1 Aim of This Research

The phenomena of split and fragmentation not only exist in the intelligence theory construct area, but also manifest in the empirical studies, expressing itself as different confusing and conflicting empirical study results. In the intelligence differentiation area, the differentiations phenomena are so different that it seems different study has different differentiation expressions. The confusing and conflicting empirical study results can also be found in the intelligence structural or mechanism area, one of which is the conflicting results in the study of the relationship of IQ and EQ.

The growing rise of enthusiasm in researches on emotional intelligence (EI) can mostly be seen over the last 20 years, although studies on cognitive intelligence (CI) can be dated back to a hundred years ago. The concept of emotional intelligence is firstly coined by Mayer and Salovey[6] [7] [8] [9] in 1990, after that, in 1996, Bar-on[10] [11] initially used the concept of emotional quotient (EQ) when he designed the Emotional Quotient inventory (EQ-i), which is also the first psychometrical scale concerning measurement of emotional quotient (EQ). In 1998, another influential EQ scale called the Emotional Intelligence Scale (EIS33) with 33 items was built up by Schutte[12], then it was developed into 41 items (EIS41) in 2004 by Austina, Saklofskeb, Huangb and Mckenneyb[13]. As opposed to the EQ researches, studies on IQ have a long history, and a lot of IQ tests have been established up to now. The Rawen's Standard Progressive Matrices inference test (SPM) is one of the most popular IQ scales which is designed to measure the general factors of intelligence according to the Spearman's theory, and its validity and reliability have been widely established.

The relationship between intelligence quotient (IQ) and emotional quotient (EQ), in all senses, should have been one of the most important and basic topics among all the arguments in this area. Although many psychologists believe that human's mind is composed of a trinity, i.e. the cognition entity, the emotion entity and the will entity, there are still many others believe the mind is only consisted of two parts, the cognition entity and the emotion entity. Either way, investigation into the quality of the relationship between cognition intelligence and emotion intelligence can help us understanding the basic mechanisms of the psychological process in mind, and, results of that still remain controversial. Some believe they are independent of each other, while others embrace the position that they are significantly correlated with each other. In other words, one of them can predict the other one, in view of the latter position. In that sense, the study on the relationship between IQ and EQ provides a meaningful insight into the understanding of the underlying mechanisms of psychological processes involving both cognitive and emotional components. Unfortunately, however, research results are not consistent, some results show a

significant correlation between them, whereas others present a non-significant correlation. This kind of conflict can somehow even exist in a single report. For example, when Schutte et al (1998)[12] calculated the correlation coefficient between the scores of the SAT and the scores of the emotional intelligence scale (EIS), a non-significant result was found at r=-.06, p>.05. But when they investigated the validity of emotional intelligence scale (EIS) in the same paper, they found that the scores from the emotional intelligence scale (EIS) can significantly predict the grade point average (GPA) at the end of the academic year, r=0.32, p<0.01. To some extent, the SAT and GPA are both believed to be good equivalents of the IQ test. In other words, these two correlation statistics should have the consistent results if they are both good equivalents of the IQ. But why are they contradictory? Schutte et al (1998) did not explain why their results are conflicting, moreover, it seems that they didn't even realize there are two conflicting results in their paper.

Based on all these split and fragmentation situations in the intelligence theoretical construction area, as well as the confusing and conflicting results in the empirical studies, the present paper is devoted to construct an integrative theory, the Multiple Integrative Dynamic System Circular Openness theory (MIDSCO), in the hope that it can solve the split and fragmentation problem in the intelligence area by incorporating existent theories, and, provide an effective reference for the solution to the split and fragmentation crisis in other psychology area. As well as that, a set of meta-theory principles to theoretically justify a theory before an empirical test is available are also established, as the theoretical criteria to verify a theory construct, say here, the MIDSCO-i model.

The MIDSCO is a meta-theory paradigm, when it is used as a guidance to construct intelligence theory, a systematic intelligence theory of MIDSCO-i is built up which can integrate most other existent intelligence structure theories, so that the split and fragmentation problem in the intelligence structure area can be solved in one go through this theory integrative research. Apart from the theoretical integration contributions, when it comes to the empirical test, this theory can also uniformly clarify and explain the confusing and conflicting empirical results of the relationship between cognitive intelligence and emotional intelligence through theoretical analyses with the MIDSCO-i model. The difference of the empirical test in this paper from those of other papers is that the logistic regression model is employed, rather than the correlation coefficient stats, as usually applied in other papers. Specifically, the predictive effect of the cognitive intelligence on the emotional intelligence is tested through two logistic regression models, one is the binary regression model, and another is the 4 categories ordinal regression model, in order to gain a convergent confirmation to the hypothesis of the MIDSCO-i model from different aspects.

2　Conceptual Construction of the MIDSCO Meta-theory

2.1　MIDSCO meta-theory

In many circumstances, scientists or psychologists often have a meta-presumption of thought process in their mind when they build up their own theoretical models, that is, take it for granted that the mental issues or activities can be explained with a pattern of static, closed, isolated, singular-factor, one-dimension and linear cause-and-effect relationship. As a result of that, many theories can only be used to explain one aspect of the target phenomena under studying. Moreover, no associations can be found among different theoretical models concerning the same topic, and sometimes, they are even conflicting or contradictory. This might also be one of the very reasons behind the phenomena of the split and fragmentation in the whole psychology domain.

In fact, sometimes psychology research target is usually not isolatable, instead, it is an

inseparable hybrid (Huang, 2018[14]). Or, to be precise, its qualities may change when it is coercively isolated. In other words, it is one integral part or element of an integrative system which has a wide variety of interactions with other components in this system. Without this integrative system in mind, a comprehensive and perfect theory cannot be built up to model the research targets. This explains why in many areas there are always so many entirely different, or even contradictory, theory models related to a same topic, because different scientists always take different aspects of an integrative system as isolatable, or, even as the whole system itself to model. Contrary to the traditional theoretical paradigm of static, closed, isolated, singular-factor, one-dimension and linear cause-and-effect relationship, the new Multiple Integrative Dynamic System Circular Openness (MIDSCO) meta-theory paradigm does not take the target issue under study as something that can be absolutely isolated, instead, it takes it as an integral component in an integrative system. As the MIDSCO meta-theory transcendentally postulates the research target is an integral part of an integrative matrix system, which connotes that, when it survives within the system, the research target has a totally different quality from that when it is isolated from the system. This apriorism postulation is quite contrary to the traditional meta-theory presumption. Nearly all traditional theories unconsciously cherish a priori assumption that the qualities and properties of the research target will remain the same between the situation when it is integrated into an organic system and the condition when it is isolated from that system, although no theorists have ever clearly and unequivocally declared this. From the apriorism perspective of the MIDSCO meta-theory, however, the qualities and attributes of the target will change when it is isolated from the integrative system in which it has ever been existing before. In that sense, the MIDSCO meta-theory paradigm takes a totally different meta-postulation when a specific theory is set up, i.e. the target under study cannot be simply isolated from its matrix system and modeled in one go as all traditional models have ever done, instead, it can only be modeled in an integrative system and explained in a series of successively and progressively anatomical layers. Figure 1 to figure 5 circumstantially embody the serial models of successive and progressive explanation paradigm. Figure 1 is the meta-theory longitudinal development model. Model 2 through 5 is a successive and progressive unfolding of the left part of the model 1. Model 2 reflects the operational mechanisms of intelligence on the cognitive representation level when it is functioning within the working memory space. Model 3 progressively expounds the structure of intelligence in the left side of model 1, model 4 (Huang, 2014)[15] is the circumstantial enunciation of the inner facet of the model 3, model 5 (Huang, 2014)[15] illustrates the specific relationship of elements from model 4 with a path-distance-process chart. Thus far, the intelligence is more thoroughly and all-roundly explained in a way of successive and progressive serial models.

This organic integrative system, in terms of its static structure (left part of model 1), on the one hand, involves multiple facets, multiple factors, multiple dimensions and multiple layers, and every component in this system will impact the representation of the cognitive target through an all-pervasive interaction mechanism. On the other hand, in a long run perspective, this system also involves a dynamic mechanism with multiple phases in its developmental process (middle part of model 1), resulting in some certain different phenotypes (right part of model 1). Intelligence is such a research issue either that, in the respect of its static structure, it interacts with a wide range of components across both outer environmental facet and inner mind structure facet. In the long run, it is dynamically developmental with multiple phases, and, can temporarily end up with different phased phenotypes. Figure 1 illustrates the triple circular processes, the left part specifies the static construct and running mechanism of the target system, the middle sub-theory reflects its dynamical development phases and development mechanism, and the right sub-system represents

the temporary essential phenotypes. It might be sensible that nearly all systems' development patterns are modeled and depicted with this continuous circular trinity. That is, multiple triple circles constitute the whole precession circle of the intelligence development, and every triple-circle's intelligence value will vary along with the precession process, reflecting the nature of intelligent progressiveness, change and development. Whenever any research target is under academic study, the study must involve all respects of the target issue which embody as the three aspects that comprise the circular trinity, without this circular trinity consideration, a complete and thorough theory related to the research target cannot be built up. It is in that sense the MIDSCO is supposed as a meta-theory concept paradigm which also includes some other apriorism assumptions.

The outer setting facet can be divided into many sub-facets. Here, in respect to the intelligence, we just consider the sub-facet of the cognitive task object and the sub-facet of rating standards. Object refers to the different cognitive tasks or psychometric tests, and the rating standard indicated the assessment criterion to the task or test result. Of course, some other sub-facets can be added into the outer facet in this model, say, if a certain association between some specific uninternalized cultural background and the intelligence is valued in a future new study, this specific cultural sub-facet, as a potential influential factor, can be added into the outer facet due to the new finding of the certain association. This meta design distinctively makes the MIDSCO model more addible and open, not like the traditional theoretical models which are all closed, non-addible and non-developable. In the inner facet, the consciousness is composed of multiple dimensions and layers, as well as multiple factors and processes, such as primary and advanced process, automatic and control process, all these interests are involved in the intelligence matrix system and are patulous and on-limits. This consideration brings to this MIDSCO model another new meta pattern of reason paradigm. That is, the reason explaining the target phenomenon is possibly not only singular and static, but also a combination concerning with different components, i.e. the reason is a combination of factors, instead of only a simple factor, as conventional theories have commonly suggested. Moreover, the combination reason is developable, addible and patulous, open and on-limits. This meta-theoretical reason paradigm (either single and static, or combination and dynamic) of MIDSCO is distinctively different from conventional theory constructs, which nearly all only suggest a singular dimension and static reason to explain the target phenomenon.

Traditionally, psychologists always hope they can separate the knowledge proportions from the intelligence itself through an IQ test with cultural fairness and educational equity when they are measuring the IQ, in order to find out individuals' pure IQ level. But in the eyes of the MIDSCO paradigm, pure intelligence does not exist. Or rather, the pure intelligent quality will vary according to what components are activated simultaneously, because it will always be interacting with other components when it is tested. In that sense, what actually exists is an integral intelligence which can only survive in its integrative matrix system, in which, knowledge is considered as an indispensable part of the intelligent activity, as a special concomitant layer within the intelligence. This consideration is just like the entangled relationship between neuro and consciousness, body and mind in philosophy. All these relationships are inseparable and mixable hybrids according to a priori meta-presumption of the MIDSCO, if a certain target is isolated from its integrative matrix system for the sake of scientific research, its qualities and properties will change. If that is the case, what we can study in terms of archetypes is not an isolated target, instead, what we can actually research in terms of prototype is just the hybrid itself surviving in the organic matrix system, when it is studied with an isolating approach, its qualities

and properties will mutate.

230　　　In addition to these, in this model, personality, which itself comprises both implicit and explicit awareness, is also taken as an important background component interacting with intelligence, i.e. as an inseparable sub-dimension interacting with intelligence. This is quite contrary to the traditional intelligence theories, nearly all of which have never taken personality as a constituent part of intelligence except for the intelligent personality differentiation theory, not to

235　speak of its indivisible quality. And again, new findings from the personality trait dimension in the future that relate to the intelligence can be added into this model either, reflecting this model's distinctive addictiveness and openness quality, a sharp contrast to the quality of the traditional theory's closeness.

　　　Besides, interactions, which can be considered as a kind of circular cause-and-effect

240　association, not only exist among components, but also occurs across sub-systems in model 1. For example, a certain resulting personality trait of intelligence differentiation, in turn, will influence the intelligence development itself. This apriorism meta-theoretical postulation of multiple interactions can be supported by the empirical fact of brain cell plasticity, in which not only the brain neuro structure governs the levels of mental activity performance, but also the mind activity

245　itself can improve the brain neuro development, providing an empirical example for the interaction effect. In that sense, the MIDSCO theory paradigm takes up a pattern of circular cause-and-effect relationship, supposing both a linear and a circular cause-and-effect explanation in its model. When the interaction values among elements are zero, i.e. when the interaction is unidirectional, the model will reduce to the traditional linear cause-and-effect relationship. When

250　the interaction is bidirectional, the cause-and-effect relationship of the model will be a circular one. This complete and flexible property makes the MIDSCO model more compatible, compared with the single liner cause-and-effect explanation in traditional theories. Thus far, the reason paradigm of the MIDSCO is not only combinational, addible and on-limits, but also either circular or linear.

　　　In this MIDSCO meta-theory paradigm, multiple indicates the research target exists in its

255　integrative matrix system which is impacted by multiple components both in and out the mind, including multiple-facet, multiple-dimension, multiple-factor, multiple-layer, multiple-phase and multiple-phenotype. Therefore, multiple means the reason explaining a phenomenon includes not only a single factor, but also a combination of factors. Integrity denotes the research target is an integral part of its own integrative matrix system, together they constitute an organic hybrid, when

260　it is coercively isolated from that matrix system, its qualities will be different from the qualities when it exists and survives in that organic matrix system. Dynamic means the system is chronically developmental with different phases in different durations. System means two things, on the one hand, system means systematic thinking and constructing, i.e. considerations should be systematic, complete and thorough, when a theory is constructed. On the other hand, system

265　means intelligence itself is also a systematic structure, the essence of intelligence is the ability to construct a conceptual system. Circular refers to that the cause-and-effect relationship can be both circular and linear, depends on whether the transactions occur among components. Openness refers to that the model is on-limits to additional components awaiting to be found in the future, which makes the model more flexible, more developable, more open to the new findings and

270　developments in its area. Besides, openness also connotes that the reasons behind the target phenomenon are combinational and developmental, apart from the conventional singular and static explanation. The gist of this theory paradigm is that it takes all components relevant to the research target into account, which characterize as multiple, integrative, dynamic, systematic, circular and open. With these qualities of the meta-theoretical paradigm in mind, many

275   psychological research targets might be modeled without missing key information.

The MIDSCO meta-theory paradigm is established in an effort to enunciate the specific approaches of how to construct a theory in a thorough and exhaustive way, in an all-round and systematical way. It is well-known that systematic thinking is the key point in constructing a model, but from what approaches that a thinking pattern can guarantee or bring us a complete
280   systematic construct still remains fuzzy for most researchers. In the hope to make it clear for the theorists, the MIDSCO meta-theory paradigm explicitly illustrates the specific and circumstantial approaches to establish a systematic construct, i.e. the circular considerations of the trinity of structure/mechanism, dynamic development and phenotypes, the specific and detailed interests in the concepts of multiple, integrative, dynamic, systematic, circular and openness. Without these
285   considerations in mind, conceptual theory constructs are more likely to alight on just a few mutilated aspects of the whole integrative system and be subject to lopsided and incomplete, and this might be one of the very reasons incurring the result of psychological split and fragmentation. Series of successive and progressive construction of MIDSCO models might be one of the effective ways to integrate split and fragmentation in psychology.

290   Although the MIDSCO meta-theory paradigm might be full and thorough in considering all aspects of the integrative system, it is not to say that small theories concerning bits of the whole target system is unacceptable. It says the traditional small theories might be the explanation of only parts of the whole integrative matrix system and is not complete in view of the MIDSCO paradigm. In that sense, if a small theory is sensible, it should be possible to embed it in an
295   integrative systematical MIDSCO model.

Nowadays, one of the greatest problems encountered with the whole psychology field is the enigma of schism and fragmentation in the whole psychology area. This enigma of disruption and segmentation exists nearly in all specific sub-areas of psychology, as well as in the whole psychology area. One of the culprits behind this puzzling maze might be that psychologists lack of
300   integrative systematic thought when they build up their own theoretical models. In other words, the psychology is short of a comprehensive and thorough meta-theory guidance directing the construction of specific theories. In that sense, this MIDSCO paradigm could serve as a meta-theory framework to guide theoretical construct, and further, to integrate all extant theories in the same area. Specifically, in terms of the MIDSCO meta paradigm, any target under study
305   should be reckoned as a system, which can only be completely described well when its structure/mechanism, dynamic development patterns and phenotypes are considered thoroughly, when its meta interests are matched with the meta presumptions of MIDSCO. In this paper, this trinity meta interest will lead to the construction of an integrative intelligence theory termed as MIDSCO-i system intelligence model. After that, this model will be theoretically testified by
310   demonstrating whether it can integrate other intelligence theories, whether it can uniformly explain conflicting findings and whether it can uniformly explain more different phenomena. In addition, empirical test will also be conducted to establish one of this model's hypotheses via using the logistic regression statistic technique.

2.2 Pure theoretical criteria for justifying a theory

315   MIDSCO not only considers what interests of elements should be involved when a theory is constructed, but also believes that a set of meta-theory principles to theoretically justify a theory should be established. It is more often than not that in practice, many theories cannot be empirically proved at the time they are constructed, i.e. many questions cannot be empirically studied at the time they are raised, before an effective empirical method is developed. No wonder,
320   it will take a long time to justify a theory before any empirical method can be conducted, when the

development of methodology has always been lagging behind the demand of proving a theory construct, or, studying the arising questions. Therefore, in many situations, a puzzle is always left there, as to how to prove and justify a theory, how to solve a problem on the theory side, before any suitable empirical methodology is developed. Some extreme positivists even suggest no theoretical study on solutions to problems should be conducted before a suitable empirical methodology is established, and, no theory should be constructed and accepted before an effective empirical methodology is formed. This suggestion, with no doubt, will badly strangle both the psychological theory construction and the whole psychology discipline's development, especially, will suffocate the originality of those scientists who are stronger thinkers of theoretical construct full of new ideas compared with other academics, stifle creativity of those who have stronger concept thinking than other researchers. In essence, this suggestion will do nothing but blot out the differences of the ability of theoretical construct between different scholars.

Usually, the development of corresponding empirical methods always lags behind the theories and questions in need, and, needs a long time to develop. Is it right that the academia should flatly refuse any theory construct until a suitable empirical method has been developed and available after a long time? Many positivism psychologists take the physics as a scientific paragon, in the hope to build up a pure empirical science in psychology. But it seems they have never noticed, pure theoretical construct can even happen in the most successful empirical discipline, the physics as a scientific paragon. Einstein's relative theory is exactly a very perfect theoretical construct. Einstein can predict many with his relative theory nearly a century ago, but many predictions cannot be proved with empirical methods at the time when he constructed his theory. Will the fact that the great theory is a pure conceptual construct render the physics a non-positivism science? Will that render the physics discipline unscientific? Absolutely not. The black hole phenomenon is one of predictions of his relative theory, which can only be proved in recent years. According to those extreme positivists, if Einstein was a psychologist and proposed a psychology theory, would they stop him by saying: no theory study and theory construct should be proposed and accepted before a suitable empirical method is developed and applied? If that is the case, would the black hole phenomenon still be found by now? What a lag would it be for the physics discipline, if a perfect relative theory cannot be constructed and accepted as a future research guidance, due to lack of empirical methodologies, due to the empirical dogmatism? In fact, what would happen is nothing but suffocation of science development by obliterating the differences of theoretical construct ability among researchers, under the flag of scientism by emphasizing the so-called pure positivism science.

To solve this problem, meta-theoretical principles to theoretically justify a theory must be established before the suitable empirical methodology is developed. Because scientists will always face the situation that suitable empirical methods are not available when a theory is constructed, when a question is arising. How to bridge the gap between the time-lag? Maybe the construction of a set of pure meta-theoretical doctrines to theoretically justify a theory is one of the necessary approaches.

There are six meta-theory criteria that seem to be the appropriate considerations according to the MIDSCO. The first criterion is whether the theory can integrate other extant theories. The more models it can incorporate, the better the theory construct is. The second principle is whether the new theory can set up some new frontiers, point out new directions, provide new aspects, raise new topics, compared with the existent theories. The more meaningful topics it can set up, the more directions it can point out, the more aspects it can provide, the better the theory is. The third principle is whether the new directions or frontiers are more significant than existing topics, are

more meaningful to the social practices. The greater the significance of the social practice is, the better the theory is. The fourth criterion is the theory construct should be logical, should be as comprehensive as possible, with logic faults as few as possible. In fact, principles two to four can be seen as the expansion of the first criterion. The more comprehensive the construct is, the better the theory is. The fewer the logical faults it has, the better the theory is. The fifth criterion is whether the theory can uniformly explain more conflicting and contradictory empirical results than existing theories. The more conflicting and confusing empirical results it can uniformly explain, the better the theory is. The sixth criterion is whether the theory can explain more phenomena and questions in the field than the existing theories. The more questions it can answer, the more phenomena it can explain, the better the theory is. The sixth criterion can be taken as the expansion of the fifth principle.

Although six theoretical principles have been established in MIDSCO meta-theory, it does not mean a theory can only be accepted by meeting all these six principles. The competitiveness of a new construct consists in the comparison with other existent theories, i.e. a single edge in any point of these six criteria should guarantee a victory of the new theory construct, compared with the conventional models. In this sense, sometimes, it does not mean an accepted new theory should be decidedly better than any existing theories in all aspects, also, it does not mean a single edge will guarantee a better theory. Instead, sometimes, it means it provides new perspectives into the research target compared with the existent theories, and, academia should accept this new perspective with greater tolerance and broad-mindedness, as long as it provides some insight from a new perspective. Only when it is more systematic, more thorough etc. than the existing theories, can it be taken as a better theory construct than the existent theories. It is only when all these considerations of pure theory principles are in mind, new theory constructs with new ideas can be accepted before empirical test is available, can have a voice in the academia, and, the creativity and originality of a theory will not be stifled. Otherwise, without the systematic construct of these pure meta-theory principles ahead of the empirical methodology development, systematic great theories uniformly explaining phenomena simultaneously cannot be constructed and the split and fragmentation crisis may still continue and cannot be solved.

The statement that a theory must be able to predict something, or, make some empirically testable hypotheses, can also serve as another principle to test certain theory. But this principle does not mean the authors themselves must empirically test their theory when they initially propose that theory, otherwise, their theory should be rejected. Instead, it just means the theory is theoretically acceptable when empirically testable hypotheses can be made based on their theory, and, when it has advantage to existing theories according to whether it meets some certain theoretical principle mentioned above. Because it is often the case that empirical methodology is usually lagging behind the needs of theories and questions, however, this statement is somehow beyond the pure theoretical test criterion domain and reached out to the empirical test principle field.

3　MIDSCO-intelligence Serial Models and its Numerous Predictions

3.1 Construction of the MIDSCO-i Intelligence Serial Models

The multiple interests and the trinity considerations in the Multiple Integrative Dynamic Systematic Circular Openness paradigm (MIDSCO) can serve as a psychological meta-theory principle directing the construction of different specific psychological theories. When the MIDSCO paradigm is applied in the intelligence, the Multiple Integrative Dynamic Systematic Circular Openness system intelligence theory (MIDSCO-i) is established which can be reflected in

a series of successive and progressive models. Figure 1 represents the longitudinal development meta-model with these triple phases in it, including an initial static structure/dynamic mechanism sub-system in the left, a dynamic developmental process sub-theory in the middle and a temporary phenotype sub-model in the right side. Model 2 illustrates the detailed representation mechanisms of the left part of figure 1 when intelligence is functioning in the working memory space. Model 3 is the static structural details of left part of the figure 1, which involves both inner-facet and outer-facet concerning intelligence performance. Figure 4 (amelioration from Huang, 2014[15]) is the structure of the inner facet from figure 3. Figure 5 (Huang, 2014[15]) uses a path model to further illustrate the correlations between different elements within the MIDSCO-i system model. Lowercase '-i' refers to the intelligence in the MIDSCO meta-theory paradigm.

According to the MIDSCO meta-theory paradigm, nearly all traditional theories just focus on only one or a few selective aspects of a whole system. This unconsciously imperfect strategy is often liable for many problems in researches, especially for the confusing and conflicting segmentation status quo in psychology, and, most of the theorists have never been aware of the fact that they are just focusing on one or a bit of the aspects of the whole system. In that sense, if the multiple quality of MIDSCO guarantees a more complete and thorough paradigm to construct a system intelligence model than the traditional singular non-systematic strategy, the intelligence theoretical fragmentation should be capable of being integrated through a series of constructs of MIDSCO paradigm. In other words, different conventional theoretical models should find their positions in a single MIDSCO-intelligence model, or, be uniformly explained by this single MIDSCO-i model, and meanwhile, many conflicting or even contradictory empirical study results might be uniformly explained with this single MIDSCO-i framework as well. The concept of multiple components, the first apriorism meta-presumption of the MIDSCO, not only involves static structural dimensions, but also concerns dynamic process patterns.

3.1.1　Model 1

In model 1, intelligence is conceived as an inseparable hybrid of mental elements which involves both psychology layers and biology substrata (left part of figure 1) and inseparably involves the outer facet, due to the ubiquitous interactions. This integration interest is the second basic apriorism presumption of this MIDSCO-i meta-intelligent theory. If the so called pure intelligence is coercively isolated from its non-separable hybrid, from its indivisible concomitant companies, its properties will change. In that sense, the inseparable quality of intelligence substantially suggests that multiple components are already automatically activated and involved in when it is measured with psychometric test presented in the outer facet, rendering the measuring results not a pure value. This priori presumption is quite different from all those traditional theories which all a priori assume pure intelligence is separable and its qualities will remain the same when it is isolated, although no intelligence theory has explicitly referred to this. Therefore, in this MIDSCO-i meta-model, intelligence is not obviously tagged and visibly pinpointed out as usual, instead, it is inseparably hybridized by and merged in the all-pervasive interactions of components in the inner facet, it is a hybrid mutant emerged from interactions of multiple components among psychological and physiological layers, as well as the outer facet, expressing or manifesting itself in the all-pervasive interactions which involves multiple dimensions, multiple layers, multiple factors, multiple facets, multiple dynamic phases and multiple phenotypes etc. Or rather, the pure intelligence is not measurable, when it is measured, it is already in a matrix system which itself is also automatically and concomitantly activated by the psychometric test itself, in other words, the psychometric test arouses not only the pure

intelligence, but also the multiple constituents, together, they comprise the intelligence matrix hybrid.

460　　This feature of all-pervasive interactions not only endows this MIDSCO-i meta-model an inseparable quality, but also embodies the third priori presumption of circular cause-and-effect relationships. The all-pervasive interactions among the target intelligence and other components are in stark contrast to traditional models, where nearly all of which just assumed a unidirectional connection, a unidirectional cause-and-effect relationship. However, this meta-assumption

465　changes the traditional model of linear relationships between factors into a pattern of circular cause-and-effect relationships, which means the resulting effect can have a backwards impact on its reason as well. When the MIDSCO meta-model says the interactions are all-pervasive, it doesn't mean all connections among components are definitely bidirectional and nonlinear. To be precise, it means both bidirectional nonlinear connections and unidirectional linear connections can coexist in this model. This third priori presumption also makes this meta-model distinctive

470　from other traditional theories which nearly all implicitly assume only one kind of cause-and-effect connection, i.e. the linear unidirectional connection.

　　The fourth feature of this MIDSCO-i is that it specifies what relevant factors, or what sub-theories or what sub-systems, should be considered when a system meta-theory is constructed. That is, the trinity consideration of the intelligent structure/mechanism sub-system (left part of

475　model 1), the dynamical development sub-system (middle part of model 1) and phenotypes sub-system (right part of model 1). Whenever a target issue is under study, it must involve explanations on these three aspects, short of any of these triple parts, the construct would be incomplete and imperfect, and this thorough thinking interest constitutes the basic consideration of the MIDSCO meta-theory paradigm. As a result of that, the model 1 of the MIDSCO-i is built up

480　as a meta-theory paradigm to integrate the intelligence structure/mechanism theories field, the intelligence differentiation theories area and the type researches, to construct and explain them altogether in a same MIDSCO-i meta-model. This is also the necessary step to integrate the intelligent structure/mechanism, dynamical development and phenotype areas into a single model, in terms of MIDSCO. Traditionally, intelligence differentiation theories seem to be a different

485　sub-area from the intelligence structure/mechanism theories, no apparent connections have been suggested between these two fields. But in terms of the MIDSCO-i meta-theory, intelligence structure, dynamic development patterns and phenotypes are the integrative trinity considerations when a large theory is constructed. In view of the MIDSCO-i meta-theory requirement, intelligence differentiation models can be conceived as the multiple dynamically developmental

490　phases of the static intelligence structure, within which three patterns of differentiation are evolved, i.e. age intelligence differentiation, cognition intelligence differentiation and personality intelligence differentiation (middle part of model 1), and finally, manifests itself as different types of intelligence and personality, which must be classified along the essence dimension of intelligence. The trinity does not end in the phenotypes, instead, it circles as a precession process

495　that constitutes the dynamic mechanism of intelligent circular precession development.

　　The fifth prior distinctive meta-presumption is that intelligence is not considered as a scalar, instead, it is reckoned as a vector (right parts of figure 1). In other words, its development is directional, it is evolving towards two main directions, the orthodox essence direction and the unorthodox heretical direction, as well as along with many other sub-directions in each side. The

500　consideration of intelligent vectorization inevitably involves the interest of human essence and intelligence essence. Human nature is essentially different from animals due to their ability to live on creativity, whilst animals have no creativity at all. That means, in other words, Human beings

can live on what they create and contribute to the world, whereas animals can only live on grabbing what have already been existing in the world. The human's intelligence is considered as

505   fitting with its essence when it is used to fend on themselves by creating, and it is considered as heretical when it goes awry to fend themselves by pillaging and cheating already existent wealth. The essential disparity of intelligence application renders intelligence into a vector, not just a scalar, and this vectorization of intelligence is also the very reason responsible for personality's essential discrepancies. In that sense, nearly all existent personality types can be taken as the

510   sub-branches of these two major personality directions. For example, both orthodox and unorthodox personality types can have extroversion personality individuals. The doctrine of vectorial intelligence can explain why some people can be easily 'successful' in an unjust society, because they have developed a negative heretical intelligence to unfairly and unreasonably benefit themselves only, instead of developing a positive essential intelligence to fairly and squarely

515   benefit themselves through benefiting the society first. This kind of intelligence is named street intelligence by Sternberg in his doctrine. In fact, many researchers (such as Collis and Messick, 2001[16]) have supposed a relationship between intelligence and personality.

The sixth characteristic of the MIDSCO-i model is that it's an open and addible system, patulous and on-limit to the development of future's new findings, to future's new theories. All

520   new findings and new theories can be added into the MIDSCO-i. For example, if a new factor in the outer facet is found to be related to the intelligence performance, what is needed to do for the researchers is just add a new sub-category into the outer facet in model 3. This characteristic also distinguishes MIDSCO-i's meta-theory from traditional intelligence theory's closed and static nature.

525   The quality of hybrid and multiple interactions together also implies this model's seventh feature, i.e. not only the reason pattern with a single static factor is possibly a recipe for the target phenomenon, but also a reason pattern with a combination of multiple factors is possibly responsible for the phenomenon. Usually, researchers always unconsciously take the reason responsible for the phenomena as a single factor which is static and undevelopable. But in terms of

530   the MIDSCO-i theory, the reason of explaining the target phenomenon is either a singular static factor, or a combination of multiple dynamic factors. That is, the reason might also be a combination of multiple factors which is dynamic and developable.

3.1.2   Model 2

Model 2 specifies what is happening on the cognitive representation level when the

535   intelligence hybrid is operating in the working memory space, i.e. the mechanisms of intelligence operation when it is representing in the working memory space. According to the model 2, intelligent representation involves both individual distributional representation and integrative combinational representation, and all information represents itself with the form of electromagnetic matrices in the brain. When stimuli tasks in the outer facet are just presented and

540   before the intelligence is controllably operating in mind, individual distributional representations automatically dominate the working memory space. The individual distributional representations generally correspond with the automatic process, and, automatic process can happen in both implicit and explicit levels. The integrative combinational representations can involve both automatic and control process, which usually manifest as generating new information

545   representations, i.e. producing generative representations in mind, and, control process can only happen at the explicit supra-threshold level. In figure 2, C1 is the inner facet matching with the outer stimuli facet, C2 is the memory background, and C3 is the attention-analysis operation system. As for the operational quality of representations, C1 contains the mapping operation

representation, C2 contains the responding-retrieving operation representation, C3 embodies
answering-receiving-recording operation representation in the first stage and generating operation
representation after that. Meanwhile, they all simultaneously comprise affluent content
representations at this stage. In fact, the memory background C2 is more than just a memory
system, it would be essentially more appropriate if it is termed as schema in terms of the cognitive
psychology, which includes not only the conventional memory system, but also the internalized
cultural meme, personality trait, opinion, stereotypes and so forth. In that sense, the implications
of the C2 are far beyond the memory system. These representation considerations also have
something to do with philosophy concepts, that is, in terms of philosophical terminology, C1 is the
perceptual representation, corresponding with the perceptual thinking, C2 is the experiential
representation, corresponding with the experiential thinking, C1 and C2 together constitute the
empirical or positivistic thinking, C3 is the rational or a priori representation, corresponding with
the rational thinking or apriorism thinking.

Specifically, in the stage 1 of intelligence operation, as the inner counterpart of the outer facet
stimulus represents in the brain, C1 representation automatically activates answering
representations of both the relevant memory knowledge C2 and the attention-analyses C3
representation simultaneously, constituting the triple individual distributional representations of
intelligence before control process is involved. In that sense, the intelligence is regarded as a
hybrid in the first stage, in other words, when the stimuli inner representations (C1) automatically
activate the answering representations from both C2 and C3, the initial automatic activating of C2
and C3 are impossibly suffocated, i.e. impossibly separated from the representation of C1. The
inseparable trinity representation in the first stage, therefore, corresponds with the MIDSCO's
apriorism meta-presumption that intelligence is a hybrid that cannot be isolated from other
components without any qualities and properties changing. Usually, human's mind is classified
into three parts, the cognition entity, the emotion entity and the will entity. If that is the case, the
triple individual distributive representations (C1, C2 and C3) together comprise the main part of
the cognition entity in the initial stage of working space, in which, the C1 maps the outside given
information from outer facets, C2 reflects the inside given information from memory schemata,
and, C3 is mainly responsible for receiving-recording information in the first place, and then,
developing generative information.

In stage 2, after the automatic responding stage of working space, attention-analyses
representation begins to generatively process the coded materials of both the memory
representation (C2) and the inner stimuli representation (C1), via either an automatic or a control
process, or both. This second stage is the key stage of intelligence operation and roughly
corresponds with the application of common decoding-coding circle representation of C3 on C1
and C2, which is mainly responsible for producing new information code products, for producing
generative representations. This common decoding-coding circle representation often manifests
itself as analyzing and evaluating, calculating and judging etc., which usually involve deleting
redundant information messengers, adding default information messengers, associating integral
information units, dissociating non-integral information units, reorganizing and transforming code
or information cells etc, leading to generation of new information product. All these generative
representation operations are conducted on the knowledge fulcrums of the given content
representations in the process of the individual distributional representations, which are typically
called calculating, evaluating, analyzing or judging process and are traditionally considered as the
only intelligent process. The given representation is different from the generative representation,
because it is either an inner map of an outer stimulus counterpart or an inner reflection of a

595   memory equivalent, while the generative representation has neither outer counterpart nor inner equivalent, it is totally novel representation completely generated by the common decoding-coding circle stage of C3. In that sense, generative representation, or, generation of new information code, is the very essence of higher intelligence, is exactly the essence of human consciousness, is exactly the essence of human beings, which often expresses as adding or

600   deleting information units, associating or dissociating information messengers, reorganizing or transforming code and generating novel representations in the mind, based on the initial given representations fulcrums. Without this process of generating novel representations of a complex system, human being's intelligence activity will have rare difference from the animal's intelligence activity. Differences of the ability to develop generative representation among

605   individuals consist of the hierarchical differences of IQ, and, govern the development of personality, constitute the basic differences of individuals, constitute the main disparities in personality, many other dimensions' differences in personality are nothing but the sub-branches of the essence differences. Without this generative representation, human's higher intelligence level will reduce to animal's lower intelligence level. That is, the essence of animal's consciousness and

610   intelligence is somehow just answering given information, then receiving, copying and recording the given representation, characterized as few generative representations, or, the essence of animals themselves is the lower intelligence characterized as pillage without any creation to the world. Quite contrary to this, the essence of human's consciousness and intelligence is producing the generative representation, or, the human's essence is the higher intelligence characterized as

615   creativity and contribution to the society. It is in that sense that the human's mind process can be named as higher intelligence, without this distinctive and typical new complicated representations generation stage, the human's mind activity cannot be termed as the true intelligence, as the core intelligence, or as the higher intelligence. Only human being has the ability to develop generative representation, but this ability is not equal among individuals, instead, there is a huge disparity in

620   this ability among individuals, which also comprises the major basis of personality differences. Moreover, the differences in the generative representation might be exactly the core difference of IQ that psychologists truly want to measure. The process of the generating new information is exactly the process of generating new representations inside the mind, where attention-analyses system (C3) plays a pivotal role in the process of generating new representations. Specifically

625   speaking, C1 and C2 are the neuroscience mechanisms which are responsible for mapping and retrieving the given representations separately, and, the C3 is the neuroscience system that is responsible for answering-receiving-recording given representation and developing generative representations. Besides, in the later of the second stage, multiple interactions will be repeatedly functioning, and, the results of calculating and judging will determine whether the emotion and the

630   will representations should be involved to constitute the intelligent product of last stage, i.e. the integrative combinational hybrid representation. Through the analyses as aforementioned, intelligence can be defined in terms of representation, in its lower level, it indicates receiving and copying given representations, which is shared by both animal and humans; in its higher level, it means produce generative representations, which reflects the essence of human intelligence. When

635   people are constructing a theory of the law behind the phenomena, they are essentially producing new generative representations beyond the knowledge fulcrums of given representation in their mind. When they are designing a new machine, solving a problem, they are essentially producing new generative representations based on the fulcrums of the given representations in their mind as well. The difference between constructing a theory and designing a machine or solving a problem,

640   is that constructing a theory has far less knowledge fulcrums to resort to compared with the latter

two. This is especially so when a large systematic theory is constructed. It is clear now from the discussion above that, therefore, intelligence is an ability of copying given representations and producing generative representations, the difference of IQ can be reflected from different levels, from the copying ability level of given representation to the producing ability level of generative representations, and, in both quality and quantity ways, rendering the IQ both vector and scalar measurement.

According to the MIDSCO-i, the C3's operational representation itself is also hierarchical, in which different levels of representation operations comprise the whole attention-analyses (C3) representation operation system. The lowest first level is answering-receiving-recording representation of attention-awakening, i.e. the copying representation, the highest third level is systematic coding construction representation, with the second level of common decoding-coding circle representations in between which also manifest themselves in hierarchical sub-levels, such as flexibility, convergent thinking and divergent thinking. Every level can involve operation of both general intelligence and specific intelligence. The coding representation in the last two levels also includes storing new representations, and, the third level of systematic coding representations of C3 also include some meta cognition components, such as introspections. The higher the level of C3's operation is, the more systematic the C3's representation is. The easiest task only requires involvement of the lowest answering-receiving-recording operation representation, whilst the most complex task demands the highest systematic coding construction representation to be involved. The extent of novelty and complexity of the generative representations reflects the hierarchical level of the C3's representation operation and the creativity of the intelligence, the more novel and complex of the generative representations formed in mind, the higher the demand on C3's representation level is, and, the higher the systematic intelligence is of that individual. In that sense, the hierarchical level of generative representation can be analyzed along two dimensions, one is the function level of the operation representation itself corresponding to task requirement, another is the ability level of the individuals using these functions. Therefore, the difference of C3 can be measured either along the function dimension itself or along the individual ability dimension. Along the ability dimensions, each level of these three function levels also has inside sub-levels among individuals, e.g. at the middle decoding-coding circle function level, different individuals will have different ability performance. The operation representation function level refers to categories of answering-receiving-recording representation and developing generative representation, the latter constitutes common decoding-coding circle and systematic coding construction. As for the ability dimension, when the ability of an individual's C3 can only respond to the given information on the answering-receiving-recording level, and, no new generative information can be developed, the individual's intelligence will reduce to an extreme stereotypical personality type, i.e. no new information can change their existent opinion, because they cannot shape new generative representations according to the different information stimuli. In contrast to the static stereotypic intelligence ability level, the more complete and thorough of a systematic construct a person can set up, the higher of the systematic coding ability that person has, the Einstein's relative theory in physics is one of the best examples of this kind of systematic coding intelligence. This interest also means that the measurement techniques of the systematic intelligence in the future might be the central of true IQ interest, and might be what the society really wants, because this kind of systematic coding intelligence is irreplaceable, only the gifted few have this kind of ability to produce perfect generative representations, the majority of the population are unable to produce perfect generative systematic representations in their mind. In other words, the perfect thinking products that the homo sapiens with complex systematic coding

intelligence can contribute cannot be replaced by other people's work, whereas the majorities' work can easily be substituted by other people. In that sense, the hierarchical level of C3 along both the function and ability dimensions might be the pure IQ that conventional theories truly
690　want, but, in terms of the MIDSCO-i, it cannot be measured without other components' activation and involvements. In other words, the ideal IQ test might only be reflected by the measurement of the extent of systematic thinking, however, it is not possible to separate it from its hybrid matrix, and further, design a test with systematic questions might also be tricky and exacting.

　　　　At last, it comes to the stage 3 when the intelligent product, the generative representation
695　together with the given representation, is formed and represented with a type of integrative combinational representation, where the systematic coding representations of C3 are applied to the C1 and C2 to develop compositions of both generative representation and given representation. The integrative combinational representation of P is a composition of five factors, the memory representation materials/codes, the stimuli's inner representation materials/codes, the will and the
700　emotion representations, as well as the live attention-analyses representation itself. But the structure of the combination representations is not consistent, it varies according to which factors are involved in, and what constituent proportion of the factors is in it, resulting in different combination representations. This integrative combine representation features the later stage of working space. Once again, the integrative combinational representation reflects the inseparable
705　meta-presumption of intelligence. In other words, the representation of intelligence will always be accompanied by other concomitant elements' representations in the working memory space, in both its initial process stage of individual distributive representation and its later process stage of integrative combinational representation. All these stages of operation representation are not a pure operation representation stage, because they involve either given representations or new
710　generative codes which are composed of both operation and content representations. In other words, when inner representation C1 is given and C2 and C3 are automatically activated, C1, C2 and C3 will all include both operation and content representations. Specifically, in stage 1, C3 is activated by C1 with answering-receiving-recording representations, in stage 2, it includes different decoding-coding circle representations, and in stage 3, it expresses as systematic coding
715　construct representations, all three stages will constitute both operation representations and content representations characterized as new generative codes, and, involve both general intelligence and specific intelligence. Thus far, it can be found that three stages comprise the intelligent representation process, i.e. the first initial automatic process involving individual distributional representation of C1, C2 and C3, the second operating process involving common
720　decoding-coding circle among different components' individual distributional representation, and the last stage, the intelligent products' presenting and storing stage, i.e. the systematic coding stage, involving either three C factors or five factors' integrative combinational representation, depending on whether the will and emotion codes are concomitant representations in the new product. If the will or the emotion factors are not involved in the generative representations, the
725　last stage of combinational representation (ellipse, P) will not involve the will or emotion representation components in it, which can be termed as cool knowledge storage, or cool intelligence products. If the will and emotion components are concomitantly involved in the intelligent new products as a result of the assessment, the last stage combinational representation (ellipse, P) will contain five factors in it, which can be tagged as hot knowledge storage, or hot
730　intelligence products. Either way, the intelligence process will definitely involve other components' representations in each stage, in both the initial individual distributive representation stage and the later integrative combinational representation stage, which entails the intelligence a

mental hybrid (Huang, 2018[14]). Also, both distributive and combinational representations are not consistent, they can vary and manifest as various compositional patterns according to the specific conditions. This model takes up the proposition that mind can be divided into three entities. If someone holds a position that mind is composed of two parts, i.e. the cognition and the emotion, and, thinks that the will is just sub-aggregate of the emotion, then the W rectangle should be changed as another E rectangle.

In addition, it is worthy of notice that only when the stimulus is kind of rude (new) information, the cognitive process can be taken as a true intelligent process, a core intelligence, or a higher intelligence. If the information is a ready (old) one, the cognitive process should be a memory retrieval process which will have a totally different process stage pattern from the rude information process, and can only be named as the pseudo intelligence, or the peripheral intelligence, or the lower intelligence activity. The difference between the core intelligence and peripheral intelligence is that whether those activities happening in mind involve activities of adding and depleting, associating and dissociating, reorganizing and transforming information codes etc., leading to generating representations.

This intelligent operation representation mechanism model is an idealized and simplified model, in practice, interactions might happen at every stage and between stages, and process pattern will change according to how strange or familiar the stimulus information is, according to what an available memory representation and intelligence ability level the brain has, and what an available will and emotion representation pattern it has. As for the icons in the figure 2, the E in figure 2 indicates the emotion representation, the W refers to the will representation, the P represents the integrative combinational representation, and C1, C2 and C3 indicate different cognition representations. Also, Cs have some associations with the thinking patterns, functioning as the representation basis of different thinking patterns. Specifically, C1 constitutes the main representation basis of perceptual thinking, C2 consists of the main representation basis of empirical thinking, and, C3 comprises the main representation basis of rational thinking. Rectangles describe all the relevant individual distributional representations and how they operate in the working memory space, ellipse (P) reflects the integrative combinational representation of the intelligent products at the later stage in the working space. If the consequent intelligent product of ellipse (P) is produced and effectively deposited in the memory, next time, it will represent in the working space as the C2 when relevant outer facet stimuli invade in the brain as inner representation (C1). In that sense, the ellipse (P) can be taken as the initial stage of knowledge formation, and, it becomes exactly the memory background (C2) at next time when it is activated by relevant invading inner representation (C1). In other words, the third stage is not the end of intelligence process, it can be recruited again at the next relevant intelligence activity, and the three stages are circular, manifest as a precession process. This characteristic endows some connections among C1, C2 and C3. When the will and emotion entity are involved, the P and C2 are hot knowledge, and the intelligent process is a hot intelligence process. When the will and emotion entity are not involved, the P and C2 are cold knowledge representation, and the corresponding intelligent process is a cold intelligence process. All representations might characterize as electromagnetic matrices in the brain. Moreover, especially, higher intelligence operation is exactly equal to the generative representation, due to its nature and essence of the new product generation. Without this typical generation process, human's mind will reduce to a stimuli-response pattern of behaviorism again, where no new information generation seems to have happened, no human agency seems to have been found. In that sense, the generative representation is exactly the essence of higher intelligence, therefore, it is also exactly the essence

of human themselves, or, rather, creativity is the very essence of human beings. Last but not least,
both individual distributional representation and integrative combinational representation can
comprise either primary/automatic process or advanced/control process, or both of them.

3.1.3   Model 3

Model 3 unfolds the structure of left part of model 1 in details. In this model, intelligence is
reckoned as a hybrid that is composed of multiple layers and dimensions. In its conscious core, it
includes the general intelligence layer, general knowledge layer, specific intelligence layer and
specific knowledge layer, as well as personality traits consisting in the explicit consciousness
dimensions. The specific intelligence layer and specific knowledge layer constitute the specific
sub-dimension of intelligence. The general intelligence layer and general knowledge layer
together comprise the general sub-dimension of intelligence. This proposition corresponds with
the MIDSCO's meta-hypothesis of intelligent hybrid, when the integral knowledge component is
separated from the pure intelligence, the measurable value of pure intelligence will change. In
other words, the expression of intelligence will pivot on what knowledge background the brain has
and what kind of knowledge is being activated and represented in mind. In that sense, if the
general intelligence layer is the initial core source of all intelligence developments, it might be
more sensible that the general intelligence is termed as raw intelligence material which can
convert into other specific intelligence materials, whereas the different specific intelligences can
consequently be termed as converted s intelligence.

On the periphery of the consciousness kernel, unconsciousness dimension also has a part in
the intelligence expressions. Unconsciousness dimension is comprised of three sub-dimensions,
the pre-consciousness, the sub-consciousness and the post-consciousness. The trinity is divided
according to whether the value of three variables, the stimulus, the process and the representation,
is over or below its threshold. When stimulus is below the limen, and both the process and
representation subliminally happen, the sub-consciousness issue is operating. All the sub-threshold
stimuli experiments in cognitive psychology exemplify this kind of non-consciousness. The
artificial grammar learning is also a typical case of sub-consciousness. The pre-consciousness can
be explained by all illusion phenomena, where stimulus is above the limen, and process operates
subliminally, but represents on supra-limen, then the pre-consciousness occurs. Nearly all illusions
in cognitive psychology can be taken as this type of pre-consciousness, because when illusion
happens, all its stimuli and representation are supra-threshold, but its process can only occur on
sub-threshold level. By contrast, post-consciousness refers to those that stimulus is above the
threshold, and the initial process and representation also occurs supra-threshold, but after that
when the retrieval of memory becomes automatic, representation works subliminally. Some
internalized cultural memes and some internalized stereotypes that can implicitly and
unconsciously influence individuals' behaviors and decisions are the very typical expressions of
post-consciousness. When the post-consciousness implicitly functions, individuals can hardly
realize its representation. In some sense, memory retrieval can be classified into two types, the
automatic and control retrieval on the supra-threshold level and the automatic responding on the
sub-limen level. Post-consciousness corresponds with the automatic representation below the
threshold. The terminology of internalization is a popular topic in both psychology and other
sociological science, but its post-consciousness essential property has never been clearly
expounded. In fact, internalized knowledge always functions as a background, influencing
individuals' decisions and behaviors without any awareness. Indeed, the internalized cultural and
stereotypical information is initially presented, processed and represented supra-threshold in the

825 first place, but afterwards when it becomes automatic, its responding representation is often subliminal, making it stealthily mould people's behaviors and decisions.

In the biological layer, physiological substratum also governs the class of intelligence expressions. As well as that, personality is regarded to be composed of implicit and explicit consciousness, and, both of which play a pivotal role in the intelligence expressions, especially in
830 its vector directions. Cultural meme is one part of the personality which often influences intelligence expressions in an unconscious way. Besides, Si and Ki represent different kinds of specific intelligence and specific knowledge separately, any kind of new Si and Ki constructed by a future theory can be added in this model, embodying the patulous and on-limit properties of this model. Specially, all layers and all dimensions can be further sub-classifed when new components
835 among certain layers or dimensions are found in the future, endowing this model a distinctive open and addible characteristic. In addition to these, primary or automatic process and advanced or control process are also introduced into this model. Consequently, the operation representation of intelligence is composed of two kinds of processes, i.e. the automatic cognitive process and the control cognitive process, in sharp contrast to most of the traditional intelligence models that
840 either only, although unstated, consist of singular advanced process, or are unclear about what process their models should have. The boundary in the bottom between two process patterns is not in the middle, it deviates toward the right consciousness part, indicating that automatic, primary process and implicit consciousness also have a pivotal role in the expressions of intelligence, the transition band between line 1 and 3 refers to the same. The primary/automatic process and the
845 advanced/control process are exactly the two kinds of cognitive process components of the mind representations, together constitute the mind representation process in model 2. When intelligence is operating, explicit and implicit knowledge will both be activated simultaneously, and multiple other components will be inseparably involved in, then, the hybrid intelligence will be emerging and operating as representation stages in the working memory platform, at last, manifesting as
850 new representation products in the core of consciousness. It is noteworthy that, although the intelligence hybrid involves many components, when intelligence is operating in the working memory space, only certain Si and Ki are running in the working memory space, other Si and Ki will seclude themselves from the consciousness space, corresponding to the fact that mind can only consciously process one thing at a time. As far as the outer facet is concerned, three
855 sub-facets are regarded to be related to intelligence performance, i.e. the uninternalized cultural sub-facet, the object of intelligent task and the assessment standard. If a new sub-facet is found to be relevant to intelligence expressions, such as the social regime facet, it can be added to the outer facet either due to this model's openness property. Also, interactions all-pervasively consist in components, leading to the certain expression of intelligence.

860 As for the inner facet and outer facet, both of them could be either cold facet or hot facet which corresponds with cold knowledge and hot knowledge respectively. The cold knowledge applies the epistemological principle of 'complete repeatability', whereas the hot knowledge applies the epistemological principle of 'part repeatability' (Huang, 2018[14]). It might be more promising in psychology that sometimes the epistemological principle of 'part repeatability'
865 should be applied, i.e. both cold knowledge and hot knowledge should be considered when scientists build up their psychological knowledge system and explain phenomena with that, because sometimes neither the research subject nor the research object is cold existence, they both are hot beings that need hot understanding and hot research. Apart from that, many researchers believed that performance-base test and self-estimated test are totally different [17] [18] [19], and, hot
870 intelligence has always been existing except for the conventional cold intelligence [20] [21] [22].

3.1.4　　Model 4 and 5

Figure 4 and figure 5 are extracted from Huang[15] 2014 with some amelioration. In model 4, the dash line ellipse represents the broad general intelligence sub-dimension from model 3, and the dot dash line rectangle represents the implicit background corresponding to different specific tasks.

875　Broad general intelligence means it includes both general intelligence and general knowledge. Smaller dot dash rectangles represent the un-activated background of specific intelligence in the long-term memory storage, while the largest dot dash rectangle represents the background of running specific intelligence in the working memory space. And especially, only one kind of specific intelligence can enter the working memory space at one time. When a certain mental task

880　is activated, certain specific intelligence, certain specific knowledge and relevant broad general intelligence together will occupy the working space, which involves both automatic and control process simultaneous. Other part of general intelligence and specific intelligence will remain within the long-term memory storage. The horizontal arrows on the top indicating the primary and advanced processes should be regarded as perpendicular to the paper plane, denoting the primary

885　process roughly matches with both the implicit and explicit consciousness while the advanced process only corresponds with the explicit consciousness. Solid line rectangle is the consciousness part of specific intelligence and knowledge. The one-time-one-task rule means that only one kind of specific intelligence sub-dimension, together with its relevant general intelligence, can appear in the working memory space at the same time. Or rather, there are many kinds of intelligence

890　hybrid that contains different combination of different components, every hybrid corresponds to a different sort of specific intelligence sub-dimension and involves different proportion of general intelligence, different implicit and explicit knowledge, as well as other different relevant components from other dimensions and facets, and, every time, only one specific intelligence hybrid can be running in the working memory space, eclipsing other specific intelligence hybrid in

895　it. The dot dash rectangle which indicates the homological implicit part also connotes that every kind of specific intelligence is influenced by its homologous implicit consciousness background. When certain specific intelligence sub-dimension is operating, its homologous implicit consciousness is also activated simultaneous, together work in the working memory space and impact the expression of this certain intelligence activity. This unique characteristic makes this

900　model distinctive from the traditional models again, by emphasizing that every specific intelligence operation will consist of both implicit and explicit processes (horizontal arrows should be taken as perpendicular to the paper plane), they both are considered as having played a role in the intelligence expressions. When certain specific intelligence involves more implicit consciousness proportions, it will operate with more automatic cognitive process, when it

905　demands more explicit consciousness proportions, it might require more control cognitive processes in the working memory space. In other words, proportion of automatic and control cognitive processes is not constant, it varies according to the requirements of specific intelligence. For example, the space perception of specific intelligence may mostly require implicit automatic cognitive process, while the mathematics extrapolation ability may require far more control

910　processes and less automatic process.

Apart from these, model 4 takes the cognitive errors into consideration either. When certain specific intelligence is measured, but an inappropriate test or task is employed, and the resulting corresponding inappropriate intelligence and knowledge are activated, measure mistakes will happen without the testers' or experimenters' awareness. In this situation, the wrong ability, rather

915　than the target ability, is activated. This measure mistake is regarded as one kind of the cognitive errors in model 4, and again, making the MIDSCO-i model distinctive from all traditional

intelligence models because of its consideration of cognitive errors in intelligence field. Model 4 is constructed to mainly illustrate the static structural relationship of general intelligence and specific intelligence, as well as the primary and advanced process, together running in the working memory space, whilst the model 2 mainly reflects the idealized and simplified intelligent operation stages through different representation patterns and their associations.

Model 5 circumstantially illustrates the relationships between different elements of intelligence with a path-distance-process diagram, which explains what kind of correlation coefficient is more likely to be significant, and what kind of correlation might not be significant. Correlation research is a popular method in intelligence field, such as the relationship of cognitive intelligence and emotional intelligence. Model 5 uses a path-distance-process construct across sub-dimensions and layers to illustrate specific relationships among different elements of intelligence hybrid in detail. According to MIDSCO-i theory, whether two certain elements are correlated significantly is a matter of what distance they have in model 5. If the two dimensions or layers of the elements are adjacent to each other, it means they have similar operation representations and content representations, demanding similar automatic and control process patterns, then they will more likely be significantly correlated; if they are far away from each other, it means they have entirely different operation and content representations and demand totally different process patterns, hence, they are highly probably not significantly correlated. Further, whether two representations are similar is still dependent on whether the outer stimuli are homogeneous. For instance, if two elements of the intelligence in model 5 are activated by the similar stimuli facets, and, have similar pattern and proportion of automatic process/control process, they will be adjacent to each other. Or rather, they will have similar content representations, similar operative representations in both supraliminal and subliminal consciousness levels, in both automatic and control processes, thus, their correlation coefficient will be more likely to be significant. In model 5, similar specific intelligence dimensions are adjacent, general intelligence is near to specific intelligence layer, but not close to specific knowledge layer, because both general intelligence and specific intelligence require more rude information process, but specific knowledge involves more retrieval operations in memory storages, rather than more rude information processing. Cognitive process of rude information is different from the cognitive operation of recollecting ready knowledge in storage, it is in that sense that the general intelligence is closer to the specific intelligence layer, and, away from the specific knowledge layer. Moreover, the type of the intelligence tests, i.e. the outer task facets, also plays a pivotal role in the statistic result of correlation research. If a test of the general intelligence and a test of a certain specific intelligence activate similar contents and operations of cognitive representation, similar process patterns, demand similar proportion between implicit consciousness and explicit consciousness, they are more likely to be significantly correlated. That means, the outer facets of tests must be analyzed before calculating the correlation coefficient, because different test will activate different cognitive contents and cognitive operations, and different content and operation representations are the integral parts of the intelligence hybrid. If different test outer facets are presented, the resulting different cognitive contents and processes will definitely tip the scales in favor of a non-significant correlation level. Thus far, according to the MIDSCO-i theory, whether elements within the intelligence are more likely to be significantly correlated will be determined by several conditions, the first is whether outer facets are similar, the second is whether the content representations within these elements are similar, the third is whether the operation representations, i.e. individual distributional representation vs. integrative combinational representation, are similar, the fourth is whether the proportions of implicit

consciousness and explicit consciousness are similar, as well as whether the assessment facets are objective and steady. All these considerations are depicted as the distance or adjacency between elements in model 5. These considerations render the issue of correlation between elements to be a more complex one.

In addition to this, there is still another very important thing that is worthy of notice. Although the general intelligence and specific intelligence is clearly depicted as different elements from model 3 to model 5, it does not mean the pure intelligence can be separately measured without quality changing as all traditional theories expected. Instead, intelligence is, according to the MIDSCO-i, still a hybrid which is comprised of different kinds of components and different proportions of these components, just like the distributive representation, combinational representation and the ellipse of the intelligent products in model 2, which are all expressed as hybrid. When it is measured, it can only be measured within the matrix hybrid that is typically inseparable. Again, this hybrid intelligence perspective makes this model distinctive from all other traditional intelligence theories either. Nearly all traditional intelligence theories just predict a single and constant relationship between elements, i.e. prediction of the correlation between elements are constant, single and invariable, but the MIDSCO-i, on the contrary, predicts a totally different variable correlation pattern. Consequently, far more complex and numerous predictions can be derived from the MIDSCO-i model, compared with the single and constant predictive correlation those traditional models have hypothesized. With this alternating and numerous hybrid meta-hypotheses in mind, many conflicting empirical research results might be uniformly explained.

## 3.2 Numerous Predictions from the MIDSCO-i Theory

According to the MIDSCO-i model, the prediction of the correlation between the general intelligence and certain specific intelligence is numerous, pivoting upon what content and operation representations they have, what process patterns they are applying and what proportion of them. More specifically, whether two elements are significantly correlated with each other will depend on whether these two elements are activated by similar outer facets psychometric tests, whether they are assessed by the same criteria, and, resulting in similar contents representations and operating representations, similar cognitive process patterns in the mind. In that sense, in the eyes of the MIDSCO-i model, the outer facet of psychometric test, or its corresponding inner objects facet, must be considered first before any correlation prediction is made. When the tests or tasks facet change, prediction will vary. This changing characteristic of predictions from the perspective of the MIDSCO-i makes this model quite different from other traditional models, which nearly all predict a constant and unchangeable correlation.

One of the popular correlation researches in intelligence field is the correlation study of IQ and EQ, thus, it is sensible to invoke the correlation between IQ and EQ as an example to demonstrate the MIDSCO-i model. Traditionally, when the correlation between IQ and EQ is investigated, the pattern of psychometric tests has never been taken into consideration, because nearly all traditional theories unconsciously take the test facets as homogenous, and, think the difference between test facets have no impacts on the measuring results. But in terms of the MIDSCO-i, different psychometric tests might be different stimuli facets, and, arouse different combination of cognitive representations and process patterns in the working space, leading to totally different measuring results. This is particularly true when the seemingly similar tests are virtually different outer facets, and, activate different inner facets, i.e. activate different representations and process patterns in the working memory space. The correlations between some IQ and EQ tests are good examples of this phenomenon. The Rawen's Standard Progressive

Matrices inference test (SPM) is built up in 1938 by Rawen and considered as the most popular IQ test, popular substitutes of IQ include scores of SAT and GPA. The most popular EQ tests are the Multiple Emotional Intelligence Scale (MEIS), built up by Salovey and Mayer[6] in 1998, and the Emotional Intelligence Scale (EIS), designed by Schutte et al[12] in 1998. For most researchers, these two EQ tests are equivalent, can be alternatively used to measure individuals' EQ value. But in the eyes of the MIDSCO-i, MEIS and EIS are not equivalent, they are not measuring the same facet. The MEIS is a task-finishing test which demands the current maximum performance on handling rude information, whilst the EIS is a self-stated test which only requires more retrievals of memory knowledge, the ready information, from the past. Without any questions, the MEIS will more likely stimulate the ability layer to work, while the EIS test will more likely invite the knowledge layer to join (figure 3 to 5). In terms of the model 2, MEIS will invite more advanced process of the C3 representations to be involved, while the EIS will invite more automatic process of the C2 representations to be involved, resulting in less relevance or overlaps between them in the mind process. In summary, in addition to a few overlaps in s knowledge layer, these two different tests still activate many different aspects of cognitive process, apply different sub-dimensions or layers, generate different contents and operating patterns in the working memory space. If that is the case, the correlation between the EIS and the SPM is more likely not significant, because the EIS invites more memory retrievals of ready information, whereas the SPM requires more inferring ability to process the rude information, i.e. different facets of the cognitive representations and processes are activated. On the contrary, the MEIS requires less automatic memory retrievals but more control process because of its task-finishing quality, in that sense, the test results of the MEIS and SPM are more likely to have a higher correlation coefficient (higher, not definitely significant), because the MEIS and SPM have more similar mind representations, or, have more overlaps and less differences in the mind representation processes, compared with the correlation of EIS and SPM.

The MIDSCO's prediction is quite different from traditional intelligence theories due to its multiple considerations of multiple dimensions, multiple layers and multiple facets etc., due to its various interests in the differences of content representations and operation representations, various interests in the differences of cognitive process patterns. In spite of these differences, it still can be demonstrated by empirical tests. Before this relationship is exemplified, the difference of two concepts needs to be clarified, that is, the concept of emotional intelligence is not the emotion concept itself. Emotional intelligence is the application of general intelligence in emotion-related issues, or, is the conversion of general intelligence in emotion field, and can be reckoned as a kind of specific intelligence. Correspondingly, emotion is the result of the application of emotional intelligence. It is in that sense that the emotional ability is regarded as a kind of specific intelligence, and, can be predicted by the general ability. But please note, emotion ability is neither the emotion itself nor the emotion knowledge.

Whenever the relationship between IQ and EQ is concerned, the first thing that needs to do is to identify what elements in the mind are virtually activated, and, which relationships are exactly measured and calculated. That is, what exact outer facets of the psychometric tests they are, what contents they have, what operation representations they activate etc. One of the effective methods to get insight into these is examining and analyzing the type of the psychometric tests. The very psychometric tests used in this paper are the SPM and EIS-41, therefore, the SPM and EIS tests themselves, as the outer stimuli facets, must be analyzed first, in order to identify what cognitive components will be activated in the working space before the actual correlation is empirically predicted. If the mind representations are similar, or, the overlaps of the mind representations are
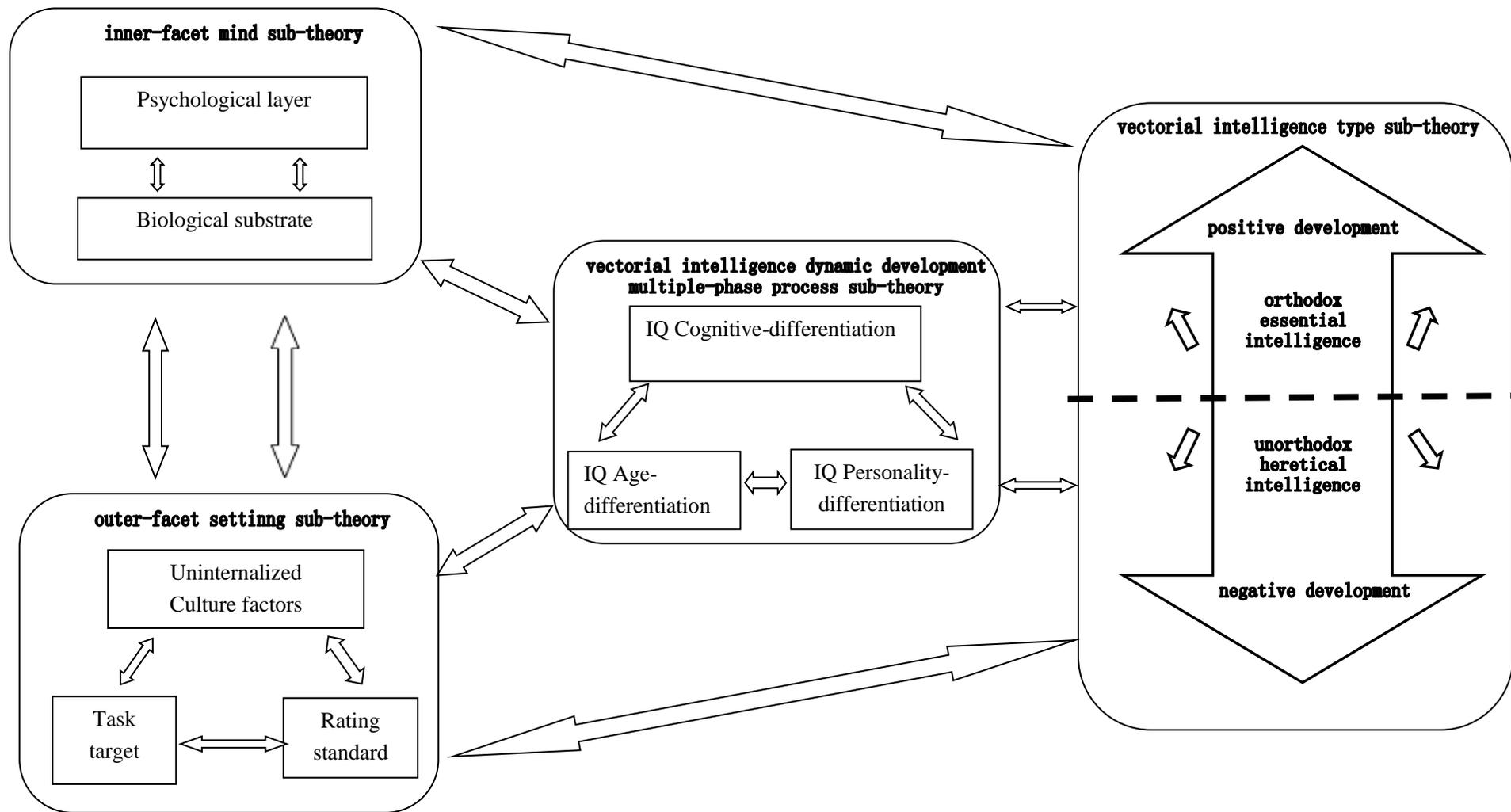
Notation:1.two-way narrow arrows:interaction effect exists among all components;
2.two-way wide and one-way narrow arrows: development direction of the intelligenc;
3.dash-line: transition band

figue 1(modle 1).Multiple Integrative Dynamic System Circular Open（MIDSCO）vector intelligecne meta-theory model

1060

C1

C3

C2

activating-answering　　　stage 1

decoding-coding circle construct　　　stage 2

stimuli inner facet electromagnetism representation matrix

memory background electromagnetism representation matrix

attention-analyses operation electromagnatism representation matrix

system coding

system coding

activating answering

stage 1

E　emotion representation

stage 2

stage 2

P　intelligence operation product representation

stage 3

W　will representation

stage 2

stage 2

decoding-coding circle construct　　　stage 2

activating-answering　　　stage 1

notation: 1.dot line:implicit consciousness;2.solid line:explicit consciousness;
　　　　3.ellipse: integrative combinational representation of intelligent elements after intelligent process
　　　　4. rectangle: individual distributional representation of intelligenct elements before intelligent process
　　　　5.bidirectional and cross arrow: permanent and all-pervasive interactions

figure 2(model 2). individual distributional and integrative combinational representation of working memory space — intelligence operation mechanism
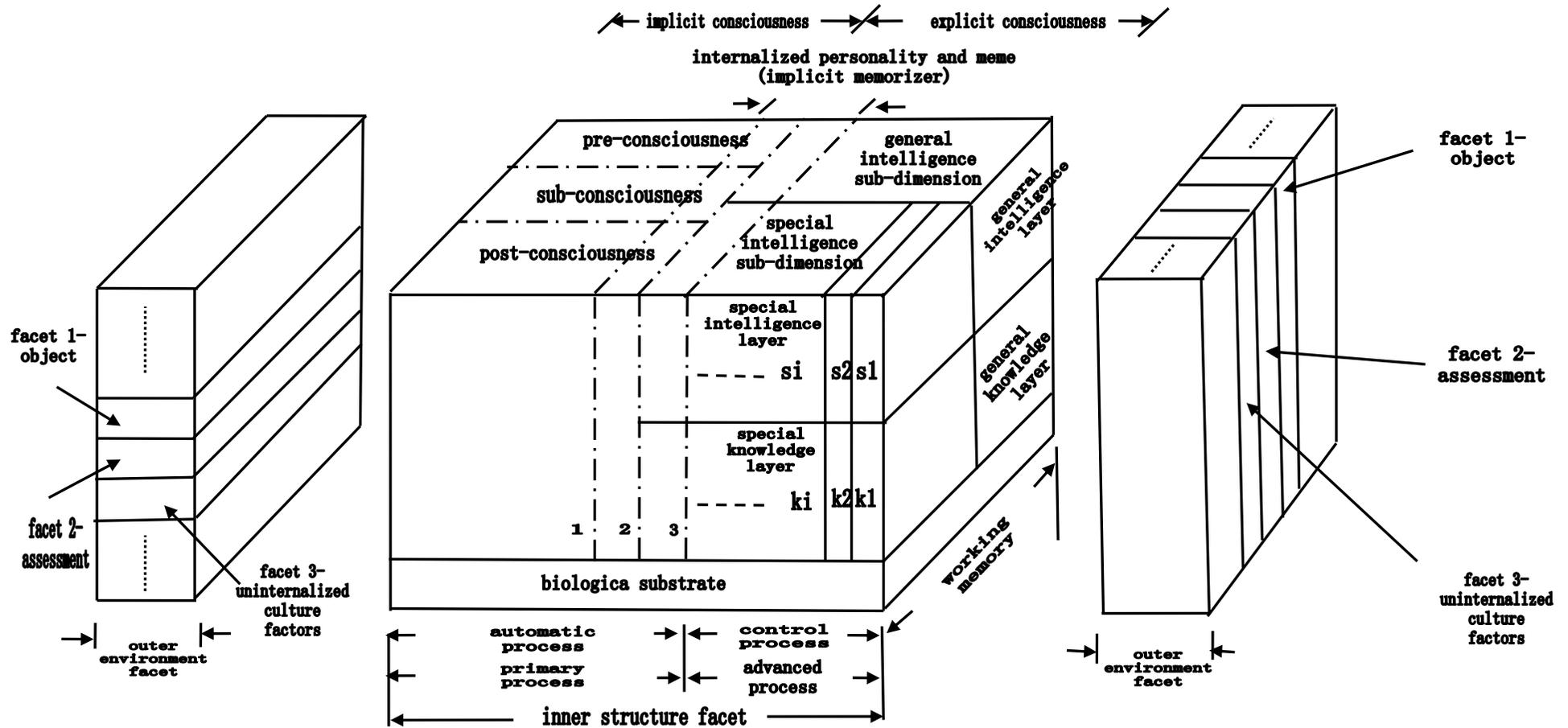
Notation:1.dash dot line: threshold is not constant;2.line 2: threshold between explicit and implicat consciousness;
3. space between line 1 and 3: threshold is a transition band

figue 3(model 3).MIDSCO dual-facet intelligence static structure model
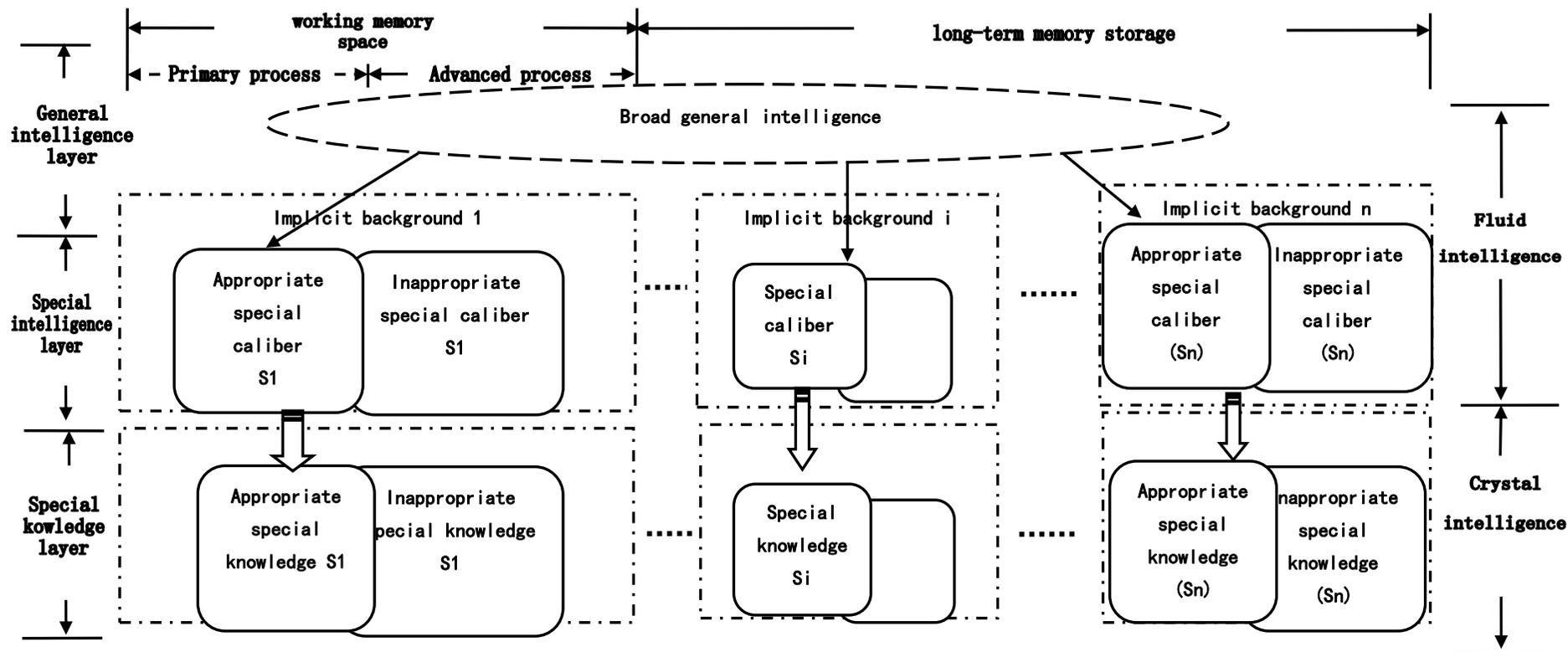
figue 4(model 4). MIDSCO intelligence structure of the inner facet

Notation:1.MEIS:multiple emotion intellegence scale;
　　　　 2.EIS： emotion intelligece scale;
　　　　 3.SPM: RAVEN intelligence test;
　　　　 4.EQ-i:emotion quotient inventory

figue 5(model 5). MIDSCO-i numerous hybrid correlation path-distance-process model
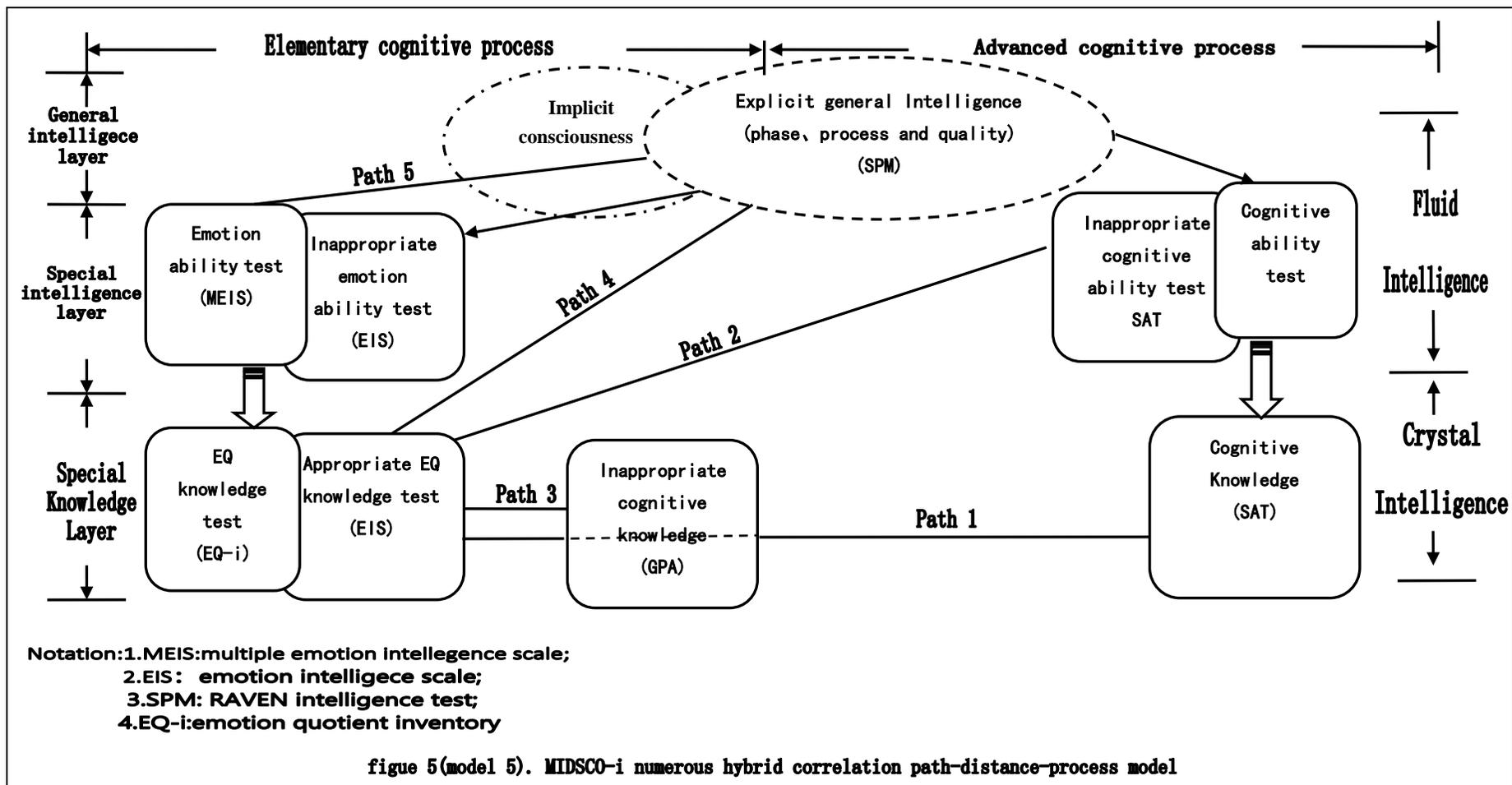
larger enough, the correlation coefficient might be higher or significant, otherwise, it will be lower or non-significant. The SPM contains five sub-tests, and its first two sub-tests involves more automatic perception process, e.g. the Gestalt perception process, while its last three parts gradually progress to deeper inference process. That means, the SPM will involve less automatic processes and more control processes, as well as more operation representations of rude information. On the other hand, the EIS is a self-stated questionnaire, requiring more recollection of the emotional knowledge, which involves more automatic process and less control process, as well as more operation representations of ready information. It is worthy of notice that the SPM presents rude information to process, inviting more involvements of the C3, while the EIS only activates the ready information stored in the memory system, inviting more involvements of the C2. In other words, the SPM belongs to the general intelligence test, while the EIS belongs to the specific knowledge test, consequently, they separately activate more different involvements of cognition contents and cognitive operations, the correlation of SPM and EIS tests are therefore more likely not significantly, or, the EIS test scores cannot be predicted from the SPM test scores. Path 4 in model 5 illustrates this prediction. Contrary to this, if the MEIS is applied which contains more control process, contains more C3 representations, it might be more sensible to predict a higher correlation coefficient between the test scores of SPM and MEIS (higher, but not definitely significant), as long as they have similar mind representations, similar proportion of primary and advanced process, as well as an objective and consistent assessment facet. In other words, the extent of the correlation between the general intelligence and a certain specific intelligence will also depend on whether they have similar mind representation and process, as well as whether they are similar stimuli facets and have similar rating facet, in that sense, the correlation extent of the general intelligence and different specific intelligence will vary according to what the specific intelligence is, and, what tests are used. This higher correlation prediction can be illustrated by path 5 in model 5. MSCEIT, as an ameliorative version of the MEIS, is also an emotional ability test, therefore, might have a similar prediction pattern with the MEIS, pivoting upon similar conditions.

4　Theoretic Verification of the MIDSCO-i Theory

4.1　The integrative function of the MIDSCO-i theory

If the MIDSCO-i theory is relatively complete and thorough, all traditional IQ structure theories should be parts of the MIDSCO-i's considerations, and, should find their positions in this MIDSCO-i construct. In other words, the MIDSCO-i model should have functioned as an integrative model to incorporate other theories, and this is the first theoretical principles to testify a theory before any empirical test is conducted. Thereupon, all traditional theories will be analyzed to see what positions they are in the MIDSCO-i model.

It is well known that in the intelligence area, there are many different intelligence structure theories coexisting and no connections among them can be found until now. Firstly, all intelligence structure theories will be analyzed, to see which parts they exist in the MIDSCO-i model and what connections they have with the MIDSCO-i system model. The Spearman's[1] [2] [3] two-factor theory classifies intelligence into two categories, i.e. the general intelligence (g factor) and specific intelligence (s factor), which are taken as different sub-dimensions in model 3 to model 5. Therefore, the Spearman's theory concerns with only two sub-dimensions in the inner facet of model 3 to 5, i.e. it is only two parts of the MIDSCO-i's considerations. Cattell[1] [2] [3] [4] divides intelligence into fluid intelligence and crystalized intelligence, which are initially two sub-categories of the Spearman's g factor according to Cattell, but in fact, it can be extrapolated to

the specific sub-dimension. In other words, fluid intelligence can be found in both general ability and specific ability dimensions, while crystalized intelligence can be found in both general knowledge and specific knowledge layers according to model 3 to 5. Also, in terms of the model 2, fluid intelligence can be embodied in the three stages of operation representations and different hierarchical function levels of C3, while the crystalized intelligence is the product content representation P and background content representation C2. Thus, the Cattell's theory concerns about four sub-dimensions in the inner facet from model 3 to 5, as well as different representation stages and levels of model 2, and therefore, can be contained and substituted by the MIDSCO-i theory. In fact, Cattell's classification is trans-dimensions, across ability dimension and knowledge dimension. And, compared with each taxonomy of the two-intelligence that Spearman and Cattell have concerned, MIDSCO-i's explanations of the related dimensions and mind course are far more specific than what they have described.

Thorndike's[1] [2] [3] three-factor theory divides intelligence into three factors, i.e. the abstract intelligence, the concrete intelligence and social intelligence. His abstract intelligence can be explained by the MIDSCO-i with the operation stages and hierarchical operation representation levels of C3 in model 2 and the advanced cognitive process of the general intelligence in model 3 to 5. On one hand, in model 2, MIDSCO-i specifies the operation representation stages and hierarchical levels of C3, which can undoubtedly embody the abstract intelligence process. On the other hand, from model 3 to 5, the MIDSCO-i divides the intelligent process into two kinds of processes, i.e. the primary process and the advanced process. Without question, Thorndike's abstract intelligence can be explained by the advanced process. Therefore, it is sensible to take Thorndike's abstract intelligence as the later stage and higher level of C3, as advanced process of *g*. As for his concrete intelligence, it can be completely substituted by the terminology of specific intelligence, and his social intelligence is nothing but one of the concrete intelligence, thereupon, they both can be taken as the certain kinds of the specific intelligence. So far, Thorndike's concepts can be absorbed into the later stage and higher operation representation level of C3 in model 2, into the advanced process from model 3 to 5, into the advanced level of general ability sub-dimension in model 3 to 5. But Thorndike's classification is not exclusive, since social intelligence is surely one of the concrete intelligence family, a sub-aggregate of the concrete intelligence, there is no need to list it alone. Moreover, his classification is not along a same dimension, instead, it across dimensions, crossing the operation representation, cognitive process sub-dimension and specific ability sub-dimensions.

Both Thurstone and Gardner[1] [2] [3] classify intelligence into seven sorts, but on the different dimensions. Thurstone takes intelligence into calculation, words fluency, understanding of words, memory, inference, space perception and perceptive speed. Thurstone's theoretical classification is trans-dimensional, his calculation, words and perception ability are from the same level of the specific intelligence dimension, but he seems to have gone further into the sub-level of the specific intelligence when he refers to the words fluency and words understanding, space perception and perceptive speed. Also, the memory can be replaced by the knowledge layers in model 3 to 5 and memory representation C2 in model 2, and, is regarded as peripheral intelligence in model 2. As for the inference, it is similar with Thorndike's abstract intelligence, and as analysed above, can be specified with stages and hierarchical levels of C3 representations in model 2, and advanced process of model 3 through 5. Thus far, it can be found that the Thurstone's seven-factor theory can be contained into the MIDSCO-i model. Similar with Thurstone's theory, Gardner also takes intelligence into seven factors, but on different dimension. His seven factors are verbal intelligence, logistic mathematical intelligence, space intelligence, music intelligence, body

1155   movement intelligence, social intelligence and self-awareness intelligence. From here we can see that he divides intelligence generally along the specific intelligence sub-dimension, in other words, his classification and multivariate construct are nothing but some specifications and categories of the specific intelligence ability, involving both primary process and advanced process. For instance, his space intelligence is undoubtedly operated by the primary processes, while his

1160   logistic mathematical intelligence definitely involves more advanced processes. Thus far, it can also be found that Gardner's theory is just parts of the MIDSCO-i model, i.e. can be merged by the MIDSCO-i theory.

    Guilford[1] [2] [3] divides intelligence along three dimensions, i.e. the operation dimension, the content dimension and the product dimension, which together constitute 180 kinds of intelligence

1165   factors in total. His operational dimension corresponds to the MIDSCO-i's composition of the operational representation in model 2 and the cognitive process from model 3 to model 5. Content dimension amounts to the composition of the representations of object inner facet (C1) and memory background (C2) in model 2. Product can be reflected by the product ellipse (P) in model 2. Also, both content and product concepts can also be explained by the knowledge layers from

1170   model 3 to 5. But, unlike model 2, he does not refer to any connects between content and product, whereas model 2 clearly describes the transforming connects between content C1, C2 and product C3. It follows that Guilford's theory, again, concerns only parts of the MIDSCO-i's construction, thereupon, can be incorporated by the MIDSCO-i model. Many differences can be found between Guilford's theory and the MIDSCO-i model, although the MIDSCO-i can merge Guilford's theory.

1175   In Guilford's model, the operation dimension includes cognition, memory recording, memory retention, divergent thinking, convergent thinking and evaluation. The content dimension includes auditory, visual, symbolic, semantic and behavioral. The product dimension includes unit, class, relation, system, transformation and implication. His classification is obviously trans-dimensional and different from the MIDSCO-i model. His operation dimension is classified across dimensions,

1180   because memory is a cognitive process dealing with ready information, while other operations, such as evaluation, divergent and convergent thinking, are more responsible for rude information, i.e. they are taken as different kinds of cognition process in terms of the MIDSCO-i model, therefore, his classification of operation is across dimensions. Besides, his classification is along the outside expression and observation dimensions of cognitive categories, instead of the inside

1185   representation level. As opposed to that, model 2 of MIDSCO-i classifies operation along the inside mind representation dimension, all categories are classified based on the same level of mind representation. Operation is, therefore, specified as activating-answering, common decoding-coding circle and systematic coding generation, which includes deleting and adding representations, associating and dissociating representations, reorganizing and transforming

1190   representations etc. Moreover, the MIDSCO-i model only takes the new information generation process as the core intelligence, thereupon, memory is taken as a kind of peripheral intelligence process, not the true intelligence itself, because only the cognition process that develops new generative representation product can be taken as the true intelligence according to the MIDSCO-i. As for the content and product, the MIDSCO's classifications of them are all along the inside

1195   mind representation dimension, while the Guilford's classifications of them are according to the qualities or categories of the outer stimuli facet and across dimensions again. For example, his content classification of auditory, visual, symbolic, semantic and behavioral is based on the quality of the outer stimuli facet. His semantic concept can manifest in either auditory or visual way, therefore, the classification is obviously across dimensions. And, all these content concepts

1200   can be substituted by the stimuli inner representations C1 in model 2. His product category is

clearly divided according to the operation results of object relations in the outer stimuli facet. His concepts of class and system are undoubtedly the sub-concepts of the relation concept, therefore, are across dimensions again. All his product categories can be substituted by the different representation combinations of P and C2 in model 2. In fact, modules of C1, C2 and P can economically contain far more information representations than the discrete categories of Guilford's theory. Apart from these differences, there is still a similar idea in these two models, that is, the Guilford defines the essence of the intelligence as creativity, while the MIDSCO-i model goes further into the mind representation level, and, defines the essence of intelligence as generating new information representation.

Similar to the Guilford theory, Eynsenck[1] [2] [3] also divides the intelligence along three dimensions, i.e. course, quality and material. His course dimension is an undifferentiated concept and amounts to the compositions of different operation representations and cognitive process patterns of the MIDSCO-i. Quality can be explained by the cognitive errors between appropriate and inappropriate sub-dimensions in model 4 and 5. Material can be reflected by the outer object facet in model 3 and its inner representation of C1 in model 2. Therefore, Eynsenck's model is also parts of the MIDSCO-i and can be incorporated by the MIDSCO-i.

The Das et al's[1] [2] PASS model from the information processing school explains intelligence through three process sub-systems, i.e. the attention-awakening system, coding-processing system and planning system. The attention-awakening system is the activating-answering (stage 1) course of attention-analyses operation representation (C3) in model 2. The coding-processing system corresponds with the common decoding-coding circle representation process in model 2, reflecting different compositions of operation representations with different proportion of cognitive process patterns in it. In that sense, Guilford's operation, Eynsenck's course and PASS's coding-processing system are somehow the same undifferentiated concept, indicating the different compositions of operating representations and cognitive process patterns in terms of the MIDSCO-i. The coding-processing system is specifically divided into simultaneous and successive processes in PASS model, the simultaneous process roughly corresponds to the automatic process in MIDSCO-i, whereas the successive process generally fits with the control process in MIDSCO-i. In that sense, the process categorization of the PASS is not exhaustive due to lack of different compositions of the representations, whilst the MIDSCO-i model can embrace numerous operation patterns by composing different representation constituents, therefore, the PASS model can also be incorporated into the MIDSCO-i theory. The planning system can also be taken as the higher operational level of the attention-analyses (C3) representation in model 2, i.e. the systematic coding construct function in model 2. So far, it is obvious that all process levels of the PASS can be replaced by the hierarchical level of the attention-analyses module (C3) of model 2, i.e. all concepts of the PASS theory are just parts of the operation stages and function levels of C3 in model 2, as well as patterns of process from model 3 to 5, therefore, can be explained and imbibed with the MIDSCO-i model.

Sternberg[5] proposes a triarchic theory of intelligence in 1985, in which intelligence is explained and discussed in three sub-systems, and, seen as an integration of these three sub-systems, i.e. the componential intelligence, experiential intelligence and contextual intelligence. The componential intelligence is also composed of three sub-components, i.e. the meta-components, performance components and knowledge-acquisition components. According to the triarchic intelligence theory, human intelligence is an integration of the conjunctive trilateral relationship, which is similar with the MIDSCO-i's conception of hybrid matrix with all-pervasive interactions in it. And, its componential intelligence sub-theory is similar with the MIDSCO's

multiple conception of multiple dimensions, multiple layers and multiple facets etc. Specifically, the meta-component fits to the meta-cognition part of the systematic coding representation of C3 in model 2. The performance component can be explained by interactions within the three process stages in model 2, and, by the process patterns from model 3 to 5, or, by the inappropriate cognitive errors in model 4 and 5. The knowledge-acquisition component is the P and formation stage 3 in model 2, as well as the knowledge layers from model 3 to model 5. As for the experiential intelligence, it includes two kinds of ability, one is the ability to deal with new tasks and new environments, another is the automatic extent of information process. These interests can be explained by the discriminative concepts of rude and ready information of model 2, by the given and generative representations in model 2, as well as by the automatic and control process patterns from model 3 to 5. With regard of the contextual intelligence, it corresponds with the object's inner representations (C1) in model 2 and various outer facets of model 3. The ability of selecting and shaping context discussed in his theory can also be explained by the all-pervasive interactions between inner facets and outer facets in model 1. Sternberg also proposes the concepts of academic intelligence, tacit knowledge, practice intelligence and successful intelligence in 1996, in terms of the MIDSCO-i theory, academic and practice intelligence are different categories of specific intelligence corresponding with the outer facet tasks, and the successful intelligence is the last stage of transforming the outer facet task. As for the tacit knowledge, tacit phenomenon occurs when the C2 in model 2 cannot be either automatically activated by the inner representation (C1), or, controllably recollected by the attention-analyses representation (C3) system. So far, all conceptions of Sternberg's triarchic theory can find their positions in the MIDSCO-i theory, therefore, can be integrated by the MIDSCO-i model. Sternberg also underlines the creativity quality of intelligence, which is similar with the MIDSCO-i's emphasis on taking generating new information representations as the essence of intelligence.

4.2 Establishment of new topics and frontiers

The second principle to theoretically justify a theory is to see whether it can set up some meaningful questions and point out some new research directions in the field for the future studies, compared with the conventional theories. The more meaningful questions it can raise, the more directions it can point out, the more research areas it can set up, the better the theory is. Regarding the MIDSCO-i theory, it can set up some academic frontiers for the future. For example, the proposals of simultaneously distributional and combinational representation, as well as the suggestion of electromagnetic matrix representation, need more neuroscience evidences, which, in turn, can guide the direction on brain neuroscience mechanism studies, can bring more cognitive neuroscience researches on the representation level. The distinction of vector essence and heretical intelligence has never been suggested by psychologist, and, both positive and negative vector intelligence have always been existing since the birth of human beings, which always results in different outcomes to social development. Therefore, this interest can lead to further inquiries into the two directions of intelligence development, such as, what makes the different development of these two vector intelligences? How does the heretical intelligence form and develop? Does the vector differentiation of essential and heretical intelligence also lead to the main differentiation of personality? What is the relationship between intelligence essential differentiation and human nature's formation and development? The proposal of systematic coding intelligence can also blaze some new trails for intelligence research. The key point of the systematic intelligence is that what questions a person can raise before he/she systematically answer the questions. The more distinctive and meaningful the question is, and, the more systematic the answer is, the higher the IQ is. Corresponding and successive topics include how to build up an effective questionnaire to

measure the systematic intelligence, what the representation mechanism of systematic intelligence is etc. So far, it can be found that the MIDSCO-i can bring up many new topics in the field, can set up many frontiers in this field. In that sense, the MIDSCO-i meets the second theoretical doctrine to justify a theory.

　　　　Nowadays, a growing interest is arising in the hot intelligence topic, therefore, intelligence can be divided into hot intelligence and cold intelligence. MIDSCO-i model 2 can explain hot and cold intelligence well by whether it involves the will and emotion representations. Also, the vector interest of intelligence in MIDSCO-i can explain the directional development of intelligence and personality. The generative representation and systematic representation of the attention-analysis operation in model 2 have expounded the essence of intelligence, have explained what kind of persons can make the irreplaceable contribution to society and what characteristics they have at their mind representation level. These explanation functions match with the third principle of justifying a theory, i.e. what kind of questions the theory can answer and explain, and, what implications and significances of the questions are, in other words, the third theoretical principle to justify a theory is to see whether the theory can raise and disclose more meaningful questions than existent theories. The greater the question's significances and implications the theory has disclosed, the better the theory is. Without questions, answering and revealing the questions of the hot intelligence, the vector intelligence, the creative essence of intelligence and the irreplaceable intelligence product are among the greatest social practices with far-reaching implication and significance. As well as that, the MIDSCO-i model generally meets the fourth requirement of intrinsic logical consistency, has more comprehensive considerations than other existent theories.

　　　　As aforementioned, in terms of theoretical verification criteria, six theoretical principles or criteria to justify a theory before empirical test is conducted have been proposed, the first is whether it can integrate other theories well, the more it can integrate other theories, the better this theory is. The second is whether it can set up new topics, whether it can raise more questions, whether it can establish a frontier topic, compared with the existent theories. The third is how great the question's implication and significance the theory disclosed is, the greater the question's meaning is, the better the theory is. The fourth is it should have logical fault as few as possible. Thus far, it is theoretically proved that nearly all conventional intelligent structure theories can find their positions in the MIDSCO-i model, in other words, all these existent theories are just part explanations of the MIDSCO-i theory and can be integrated by the MIDSCO-i model. In addition to that, the MIDSCO-i model also meets the second to fourth principles, and, therefore, can theoretically prove itself.

4.3 Uniformly explaining the conflicting study results with MIDSCO-i

　　　　The fifth theoretical criterion to justify a theory before any empirical test is implemented, is to see whether it can explain different conflicting study results with an identical theoretical concepts framework. The more conflicting results it can uniformly explain, the better the theory is.

　　　　The relationship of cognitive intelligence and emotional intelligence is one of most important topic in psychology[23] [24] [25] [26]. So far, research conclusions about the relationship between intelligence quotient and emotional quotient have been not consistent, some studies concluded that IQ and EQ have some significant correlation, while others find no significant correlation between IQ and EQ. These conflicting results can even be found in a single research. In 1998, Schutte et al[12] studied the correlation between IQ and EQ in university freshmen, when they were designing an emotional quotient scale (EIS). They first employed 42 students, using their SAT scores as the substitutes of their IQ scores to calculate the correlation coefficient with the EIS scores, and found a non-significant correlation between them, $r_{(41)} = -0.06$, $p > 0.05$. Later, when they studied the

predictive validity of the EIS in the same paper, they employed 64 students to investigate the correlation between IQ and EQ, but this time, they used the GPA as the equivalent of IQ, and found the coefficient is significant, $r = 0.32$, $p<0.01$. Schutte et al didn't make any explanation why the correlation study results in their paper are contradictory with each other, and it seems that they didn't even notice there is a conflicting result in their paper.

　　　　Traditional theories are powerless to explain this conflicting result, but the MIDSCO-i can uniformly explain these contradictory study results. According to the MIDCO-i model, different test is different outer facet which can activate different inner representation. That means, the apparent same tests may be virtually different outer facets and invite different inner representations, and, lead to a totally different intelligence process. Therefore, the quality of the tests, i.e. the EIS, the SAT and the GPA, must be analyzed first, to see whether they are the appropriate tests. At first sight, the EIS seems to measure the emotional ability as it claimed, but in practice, it applies a self-stated scale which might invite more memory recollection than ability performance. In terms of the MIDSCO-i, it is an inappropriate psychometrical test, only activating more inappropriate inner knowledge representations. In other words, what it measures is the emotion specific knowledge layer, not the emotion specific ability itself. As for the SAT, since it mainly includes the examination scores, its assessment can mainly be made by a set of standard answers which will make its assessment facet more objective, resulting in SAT score closer to the general IQ score. But the GPA score might have a different story, the result of it involves different kinds of scores, such as examination, presentation, paper writing, project, seminar discussion, etc., most performance of these will definitely be related to the interaction quality with the teacher except for the exam, which might more likely make the GPA have more emotional understanding components in it, especially when teachers mark students' work with some unconscious hot intelligence process in it and when their assessment standard changes. This interest leads to another important consideration of assessment facet in MIDSCO-i. Since the assessment of GPAs is not as objective as the assessment of the SAT, i.e. the SAT has a more objective criterion, while the GPA's score might more likely depend on the teacher's subjective criterion, consequently, scores of the seemingly same GPA might be heterogeneous and unstable. This consideration is the very interest of assessment facet in model 3. In that sense, the quality of the GPA's mark might be more complex, different GPA scores might be totally heterogeneous, might be the results of interaction between different outer stimuli facets and assessment facets, i.e. whether the scores of the GPA are homogeneous will depend on whether they have same score structures, whether they have same assessment outer facets in terms of the MIDSCO-i. In other words, the assessment facet of the GPA is not a cold outer facet. Instead, it is a hot outer facet of hot knowledge varying according to teachers and their interactions with students. Consequently, regarding the correlation of EIS and SAT, if the EIS is inappropriate test, and, when the EIS deviates from the specific intelligence ability dimension and towards the specific knowledge layer, the correlation between the EIS and SAT might more possibly be non-significant, because there are at least two layers (g ability and s ability) between them, i.e. their cognitive representations and process patterns are less similar, path 1 and 2 in figure 5 illustrate the non-significant correlation between them. As for the correlation of EIS and GPA, when the assessment facet of GPA is unstable and less objective, GPA measurement might deviate from the general intelligence value, either closer to or drift from the emotional specific intelligence dimension measurement, i.e. it might have, or, not have, a similar cognitive representation and process pattern with the emotional intelligence operation, resulting either a significant, or, non-significant correlation. When the assessment facet of the GPA is more objective and stable, they might more likely be a good substitute of the general

1385　intelligence, and therefore, have more connections with the *g* ability and EQ ability scores and fewer associations with the EQ knowledge scores. Schutte et al used a knowledge layer scale of EIS, if his GPA is objective and stable, and can serve as a substitute of the *g* factor, it should not have significant correlation with the EIS scores according to the MIDSCO-i's prediction. Here, his correlation of the EIS and GPA is significant, that might mean, his GPA scores might be less

1390　objective and probably deflect to the EQ knowledge layer, path 3 in model 5 illustrates this. In brief, whether a correlation is significant will depend on many factors, such as whether they are suitable tests, whether they are the similar outer stimuli, whether they are measuring the same layer or dimension elements, whether they have similar assessment facets etc. In essence, it depends on whether they have similar inner cognitive representations and process patterns.

1395　Therefore, the apparent conflict of the results in the Schutte's paper is actually not conflicting, instead, it is just different manifestations of the different measuring facet and assessment facet. So far, Conflicting correlation results involved GPA can be uniformly explained well by introducing the concept of assessment facet into the model 3.

　　　　Brackett and Mayer[27] found in 2003 that the MSCEIT score is significantly correlated with

1400　both GPA and SAT, but the EIS33 is not significantly correlated with either GPA or SAT. The MSCEIT is an amelioration substitute of MEIS. According to the MIDSCO-i, if the assessment facet of GPA is objective, its score might be a suitable substitute of general intelligence, therefore will have a higher correlation with the emotion ability test of MSCEIT. The result of Brackett and Mayer matches with this prediction of MIDSCO-i. The non-significant correlation between EIS

1405　and GPA is sharply contradictory to the Schutte's result. As for the contradictory results involved GPA, according to the MIDSCO-i, heterogeneous GPA measurements and heterogeneous assessment criteria might be responsible for this disparity. As discussed above in particular, Schutte's GPA assessment facet might not be objective, and deviates towards the emotion specific intelligence dimension, resulting in a significant correlation. But Brackett and Mayer's GPA might

1410　have a more objective assessment facet, no wonder, a non-significant correlation can be predicted between the EIS (knowledge layer test) and this more objective GPA according to the MIDSCO-i. Regarding the results involving the SAT, the correlation result of EIS and SAT is the same as the Schutte's, which is already explained above by the model 5. As for the correlation involving the MSCEIT and SAT, MSCEIT is considered as a measurement of the specific ability layer

1415　according to the MIDSCO-i, the distance between them in terms of model 5, or the representations between them in terms of the model 2, is closer compared with the EIS and SAT, hence, the correlation of MSCEIT and SAT is more likely higher than the correlation of EIS and SAT.

　　　　The correlation of EIS and APM is also investigated by Zhu[28] in 2004, and a non-significant correlation is found, which conforms to the prediction of the MIDSCO-i. As aforementioned, the

1420　MEIS and SPM are more likely to have a higher correlation coefficient, this prediction is also confirmed by the study of Zhu and Geng[29] in 2011 when they use the MSCEIT as an EQ ability measurement.

　　　　Other similar conflicting study results can also be uniformly explained by the MIDSCO-i model in this detailed analytic way. Apart from that, many phenomena that cannot be explained by

1425　other conventional intelligence theories can also be explained well by the MIDSCO-i theory. This interest leads to the sixth principle of theoretically justifying a theory. In other words, the sixth principle to theoretically justify a theory is to see whether the theory can explain more phenomena than existent theories, whether the theory can answer more questions than extant theories. The more phenomena a theory can explain, the more questions a theory can answer, the better the

1430　theory is. For instance, 'street intelligence' can be explained by the negative development of

vector intelligence in model 1, other phenomena such as stereotype, inertial or tacit knowledge and hot intelligence etc. can also be explained by the MIDSCO-i model. Again, this makes the MIDSCO-i theory meet all the six theoretical assessment criteria that the more questions a theory can answer, or, the more phenomena a theory can explain, the better the theory is. Besides, other researchers who find other principles are suitable to theoretically justify a theory can also propose their theoretical doctrine, if only they can systematically discuss it on the meta-theory level. Again, this makes the MIDSCO-i model patulous and on-limits. So far, in the light of theoretical justification, MIDSCO-i meets all the six meta-theoretical test criteria before any empirical test is administered.

5　Empirical test of MIDSCO-i's hypothesis

5.1　Hypothesis from the MIDSCO-i

If the MIDSCO-i is correct, its prediction or hypothesis should also be capable of being empirically tested. The MIDSCO-i takes intelligence as a hybrid with multiple factors, multiple layers, multiple facets and multiple dimensions in it, as well as multiple representations and process patterns. In model 3 to 5, emotional intelligence is considered as one of the specific intelligence sub-dimensions, and emotional knowledge is considered as one of the specific knowledge layers. Therefore, according to the path-distance-process model (figure 5), the general IQ can be used to predict the EQ ability, but cannot be used to predict the EQ knowledge, because the general IQ and the EQ ability have more similar or overlapped representations, i.e. they are closer to each other in terms of the model 5, whilst the general IQ and the EQ knowledge have less similar or overlapped representations, i.e. they have a specific ability layer in between and are away from each other.

The EIS is initially designed by Schutte et al to measure emotional ability, but according to the analyses of the MIDSCO-i theory, EIS is not a suitable test for emotional ability measurement, it is closer to measure emotional knowledge due to its quality of self-stated, instead of task-accomplished. Therefore, according to MIDSCO-i, scores of IQ measured by the SPM will not significantly correlate with EQ scores measured by the EIS41, i.e. the IQ scores of SPM cannot predict the EQ scores of EIS41. Specifically, if logistic regression model is built up to predict the probability of EIS41's EQ level with IQ from SPM, the models will not be fitted significantly, i.e. the null hypothesis will be exactly what is expected by the below empirical study.

5.2　Methods

5.2.1　Participants, data collection and management

Chinese version of SPM and EIS41 is used in this study. Participants are 260 university students from China aged from 17 to 24. They are randomly recruited separately in six psychometric test sessions. Each test session lasts about 50 minutes (10 minutes for the EIS41 test and 40 minutes for the SPM test respectively) with participants counting from 30 to 60 in each session. During each session, they all need to finish the EIS41 test first and then finish the SPM test consecutively. Because the mark of the SPM is calculated with the deviation intelligence score which is age–related, 33 sets of participants' data without demographical information are dismissed as invalid and hence are deleted. Therefore, only 227 cases data are valid for further analysis in the present study in which there are 172 female students, 55 male students, and 39 student representatives. The average age of participants is 19.76, standard deviation is SD 1.602, the maximum of age is 24, the minimum of age is 17.

Variables used in this study include gender, representative, age, IQ score and EQ scores.

Gender and representative are dummy variables. Representative denotes whether a participant is a student representative. If he/she is a representative, rep.=1, otherwise, rep.=0. If a participant is female, gender=1, for a male student, gender=0. The IQ score ranges from 50 to 128, average 104.43, SD is 14.010. The EQ scores' range is from 98 to 181, average 149.36, SD is 14.352. The

1480　EQ scores are divided into either two categories in terms of binary logistic regression or four ordinal categories in terms of ordinal logistic regression. When the EQ scores are classified as two levels, the mean of EQ at 149.36 is applied as the dividing line which is approximated with 150. "1" indicates the higher EQ category, "0" means the lower EQ cohort. When the EQ scores are divided into four ordinal categories, the approximate first, second and third quartiles are applied as

1485　the dividing lines which are 141, 150 and 160 respectively. 4 denotes the highest EQ level, 1 represents the lowest one, with 3 and 2 in between sequentially.

The STATA package is used to test the statistical significance of both the binary and ordinal logit regression models.

5.2.2　Measurements

1490　Two psychometric tests are employed. One is the Rawen's Standard Progressive Matrices inference test (SPM) that is one of the most popular Intelligence Quotient scale built up by Rawen in 1938. The SPM is confirmed to be significantly reliable and valid by many researchers, such as reported by Pind, Gunnardottir and Johannesson[30] in 2003 and Abdel Khalex[31] in 2005 respectively. The final transformed IQ scores are continuous data and are employed as an

1495　independent variable to predict the EQ scores.

Another psychometric test is the Emotional Intelligence Scale (EIS) designed by Schutte et al[12]. in 1998. The original EIS has 33 items, then it is developed into 41 items by Austina, Saklofskeb, Huangb & Mckenneyb[13] in 2004, and its corresponding validity is also proved by them in that report. Some items of EIS41 are reverse-keyed which need to be transformed with the

1500　equation (n+1)-i (n is the maximum of point classification, i is the score the certain item). The category of the overall EQ scores is used as a dependent variable which is divided into either binary or four ordinal categories. To increase the convergent validity, both binary and ordinal regression models are employed [32] [33] [34] [35].

5.3　Binary regression model and results

1505　The binary logit model used to test the prediction of IQ and EQ can be presented as below:

$$P\ (y=1 \mid x_i) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon \qquad (1)$$

In which, α represents the intercept of the model, β_i denotes the coefficients of various

1510　variables, x_1 represents the dummy variable of gender, x_2 is the dummy variable of representative, x_3 is the continuous variable of age, x_4 is the continuous variable of IQ score, y is the ordinal EQ categorical variable, P means the probability of y=1, ε is the error. This binary model connotes that not only variable of IQ but also variables of gender, representative and age can simultaneously predict probabilities of EQ level.

1515　The null hypothesis can be expressed as H_0: $\beta_1=\beta_2=\beta_3=\beta_4=0$; the alternative hypothesis is H_a: at least one of the $\beta_i \neq 0$. In this study, the null hypothesis is exactly what is expected by the MIDSCO-i theory.

Table 1 shows that the overall binary model is not statistically significant, statistics of LRχ^2=3.39, Prob.=0.4947, and, Pseudo R^2=0.0108 is not within the range of 0.2 to 0.4. These

1520　non-significant results can also be found from the coefficients of independent variables in table 2 which are all not significant, similar non-significant results of odds ratio can also be found from

table 3. All the results indicate the null hypothesis cannot be rejected.

5.4 Ordinal regression model and results

The four categories ordinal logit model used to test the connection of IQ and EQ can be depicted as below:

$$P\ (y{=}j \mid x_i) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon \qquad\qquad (2)$$

In which, the j denotes the code of categories (j=1, 2, 3, 4), other symbols used in this ordinal model have the same meanings as model (1). This ordinal model also implies that variables of gender, representative, age and IQ can simultaneously predict EQ probability.

The null hypothesis can be expressed as H_0: $\beta_1{=}\beta_2{=}\beta_3{=}\beta_4{=}0$; the alternative hypothesis is H_a: at least one of the $\beta_i{\neq}0$. The null hypothesis is exactly what is expected by the MIDSCO-i theory.

Table 1 also shows that the overall ordinal model is not statistically significant, LRχ^2=2.53, Prob.=0.6391, and, Pseudo R^2=0.0040 is not within the range of 0.2 to 0.4. These non-significant results can also be found from the coefficients of independent variables in table 4 which are all not significant, similar odds ratio non-significant results can also be found from table 5. All the results suggest the null hypothesis cannot be rejected.

Tab. 1　Significant effects of the overall models

	LR chiχ^2(4)	Prob.> chiχ^2	Pseudo R^2
Binary	3.39	0.4947	0.0108
Ordinal	2.53	0.6391	0.0040

Tab. 2 Coefficients of the binary model

	Coef.	*SE*	*z*	*P>|z|*	*[95%*	*Conf. Interval]*
Gender	.3491567	.3185613	1.10	0.273	-.275212	.9735255
Rep.	.4267289	.3610969	1.18	0.237	-.281008	1.134466
Age	-.0507446	.0850376	-0.60	0.551	-.2174152	.115926
IQ	-.0078934	.0096901	-0.81	0.415	-.0268858	.0110989

Tab. 3　OR significance of the binary model

	Odds Ratio	*SE*	*z*	P>|z|	[95%	Conf. Interval]
Gender	1.417871	.451679	1.10	0.273	.7594111	2.647261
Rep.	1.532237	.5532861	1.18	0.237	.7550223	3.109512
Age	.9505214	.08083	-0.60	0.551	.8045959	1.122913
IQ	.9921376	.0096139	-0.81	0.415	.9734724	1.011161

Tab. 4　Coefficients of the ordinal model

	Coef.	SE	z	P>|z|	[95%	Conf. Interval]
Gender	.1923226	.2822212	0.68	0.496	-.3608218	.7454651
Rep.	.4523711	.3125707	1.45	0.148	-.1602563	1.064999
Age	-.0314214	.0756252	-0.42	0.678	-.179644	.1168013
IQ	.0013148	.0083685	0.16	0.875	-.0150871	.0177168

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Tab. 5　OR significance of the ordinal model

	Odds Ration	SE	z	P>|z|	[95%	Conf. Interval]
Gender	1.21206	.3420692	0.68	0.496	.6971032	2.107421
Rep.	1.572035	.4913722	1.45	0.148	.8519254	2.900835
Age	.9690672	.0732859	-0.42	0.678	.8355676	1.123896
IQ	1.001316	.0083795	0.16	0.875	.9850261	1.017875

6　Discussion and conclusion

As for the empirical test, since both the binary and ordinal models are not statistically significant, there is no point and no necessary to analyze other statistics, such as the odds, odds ratio, predicted probability value, probability change etc.

According to model 5, only when elements are close to each other, they can have a higher correlation coefficient. Since the EQ score from the EIS41 is the measurement of specific emotion knowledge, not the measurement of emotion ability itself, the hypothesis predicted from the MIDSCO-i is IQ measured from the SPM cannot predict the EQ scores measured from the EIS41, i.e. the null hypothesis will be the expected research hypotheses in the present paper. Both models' statistic results suggest that the null hypotheses cannot be rejected, i.e. both the binary and ordinal regression models are not suitable for predicting the probabilities of the EQ levels of EIS41 with the variable of IQ from the SPM. Besides, not only the general IQ from SPM cannot predict the EQ from EIS41, but the variables of gender, representative and age cannot predict the EQ scores from EIS41 either. Considering that the age difference range is only seven years, a range restriction might be impacting the result of statistics.

Based on this convergent confirmation from logistic regression models, a conclusion can be drawn that the MIDSCO-i is empirically established.

One of the most important issues is that, when the correlation between elements in MIDSCO-i model is concerned, extra attentions must be given to the outer facets of assessment and task, since both the assessment facet and outer task facet are regarded as an integral part of the performance of intelligence hybrid itself. This consideration makes the MIDSCO-i theory remarkably distinctive from all other traditional models especially when the concepts of hot facet and hot knowledge are introduced into this model. Without the concepts of hot facet and hot knowledge, some conflicting empirical results cannot be uniformly explained. However, when these concepts are introduced into the MIDSCO-i model, some certain conflicting empirical results can be uniformly explained by this model. This success of uniform explanation by introducing hot concepts indicates that it might be more promising in psychology that sometimes the epistemological principle of 'part repeatability' should be applied, i.e. both cold knowledge and hot knowledge should be considered when scientists explore and build up psychological knowledge system, because sometimes neither the research subject nor the research object is cold

existence, they both are hot beings that need hot understanding and hot research. This is not to say that psychologists should abandon the 'complete repeatability' epistemological principle, it says, both principles of 'complete repeatability' versus 'part repeatability' should be available according to what object (cold or hot) they are facing and what kind of knowledge (cold or hot) are needed, because the social object is a cold-and-hot hybrid, unlike the natural object which only consists of cold part. In that sense, when study is on the cold part of the psychological object, cold explanation and complete-replication of epistemological principle should be applied among cold and innocent researchers, but when the study relates to the hot part, hot interpretation and part-replication of epistemological principle should be applied among hot and experienced researchers. That means, somehow, researchers should have some hot experience in case that an involved comprehension to the hot knowledge part of the psychological object is needed, not like what the empirical scientism has emphasized that researchers should always detached in order to get an objective understanding of the cold knowledge. However, extra care should also be taken in case that the part-repeatability and hot interpretation principle are arbitrarily abused by pseudo-scientists who might claim a pseudo-knowledge as a hot finding, and, this issue still remains further studies as to how to prevent abusing pseudo-knowledge as hot knowledge when the hot meta-criteria are still not so clear. The key point to avoid confusion in hot academic researches seems to be philosophically creating a set of meta-criteria to judge hot knowledge, hot study, hot object, hot facet, hot intelligence, hot comprehension, hot interpretation, etc.

MIDSCO-i is built up to integrate the split and fragment situation in intelligence theory constructions and conflicting study results in intelligence empirical researches. The present paper only deals with these problems within the intelligence structure area, the integration theory study regarding the intelligence differentiation area will be discussed in another paper. So far, the MIDSCO-i model is first tested according to the theoretical principles, and then, tested by empirical method. Both of which prove it works well on the intelligence structure part, most traditional theories can be incorporated into this model, and, many conflicting empirical study results can be uniformly explained by this theory.

In model 1, intelligence is not just regarded as a scalar as all traditional theories have usually suggested, instead, it is considered as a vector. Obviously, this consideration has some associations with the intelligent personality differentiation area, makes intelligence more relate to the formation and development of the personality. This topic about the vector intelligence development needs further discussions in the future and will be explored in other papers. The integrative function of the three sub-systems in model 1 will also be addressed in other papers.

The systematic intelligence is not discussed enough in this paper. And, in order to find the irreplaceable work of highest system intelligence, how to design an effective systematic intelligence test, and how to measure the extent of the systematic intelligence still remain further investigations. This might be one of the most challenging works of the MIDSCO-i system intelligence theory in the future. Apart from that, the electromagnetic matrix hypothesis of consciousness representations, the concepts of distributive representation and combinational representation, as well as the different composition of representation patterns, still need further neuroscience investigations.

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MIDSCO智力理论构建及其理论和实证检验

1710

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摘要：针对智力研究领域的分裂和碎片化现状，论文首先提出了一个多重整合动态系统循环开放（MIDSCO）范式，以整合智力研究的分裂和碎片化状况，这一范式实际上也是一种指导理论构建的元理论原则。之后，随论文随之构建了一个与这一范式相对应的MIDSCO-i智力理论，以及一套在实证检验得以实施之前如何检验理论的元理论标准。MIDSCO-i智力理论是一个包括五个系列模型的系统化理论体系，这一智力理论体系是基于认知表征和认知加工水平的系统化构建，该理论模型既能对相互冲突的智力现象予以统一的解释，同时也能整合不同的智力理论。在MIDSCO-i理论模型构建之后，论文又对该模型同时进行了理论检验和实证检验。就模型的理论检验方法而言，论文构建了六条元理论检验标准，当这些纯粹理论检验标准运用于模型检验时，结果显示MIDSCO-i模型能够很好地符合这六条纯粹理论检验准则。在实证检验部分，论文采用了两种逻辑斯蒂克回归方法以增加实证检验的汇聚效度，检验结果显示，MIDSCO-i预测的元假设不能被拒绝，模型得到实证检验结果的支持。MIDSCO首先是作为一种整合智力研究分裂和碎片化现状范式提出来的，理论检验和实证检验结果均显示，遵循这一范式构建的MIDSCO-i智力理论模型运行良好。

关键词：智商；情商；智力理论；元心理学理论；MIDSCO；智力矢量化；热知识；心理学整合

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