**THE V&V BARAS A STATISTICAL TOOL OF MEASURING LEARNEDNESS**

**INCONTEMPRORARYMODERNGREEK**

ABSTRACT

Η σύγχρονη Νέα Ελληνική διαθέτει το ετυμολογικό/πραγματολογικό χαρακτηριστικό [+/-λόγιο], το οποίο σύμφωνα με τους Αναστασιάδη-Συμεωνίδη &Φλιάτουρα 2004, 2018) εκπροσωπεί όλα τα γλωσσικά επίπεδα (φωνολογία, φωνολογία, σύνταξη και σημασιολογία), καθώς και το λεξιλόγιο, και καθορίζεται με βάση ένα συνεχές με δύο ευέλικτες ζώνες, τη λόγια και τη μη λόγια, που συναντιούνται στην επικαλυπτική κατανομή της νόρμας, με περιπτωσιολογική ένταξη των τεμαχίων και των παραγώγων τους σε σχέση με γλωσσικά, χρηστικά και κοινωνιογλωσσικά κριτήρια. Η παραπάνω θεωρητική επισήμανση θα μπορούσε να ελεγχθεί από μια σειρά πειραμάτων μέτρησης του βαθμού λογιότητας με βάση ένα μη κατευθυντικό μεθοδολογικό εργαλείο υψηλής ευαισθησίας και μαθηματικότητας.

Η παραδοσιακή κλίμακα Likert δεν επαρκεί για τη μέτρηση των συνεχών κυρίως λόγω ανεπαρκειών στον σχεδιασμό και στη μαθηματική επεξεργασία των δεδομένων. Πιο ενδεδειγμένη μέθοδος αναδεικνύεται η ράβδοςV&Vbar, διότι, εκτός των διαδικαστικών προτερημάτων και της λεπτομερούς κατανομής, επιτρέπει βάσει μαθηματικών μοντέλων, όπως των παραβολών και της καμπύλης του Gauss, σε συνάρτηση με τις αποκλίσεις και τις πυκνώσεις των απαντήσεων, την εξαγωγή ακριβέστερων αποτελεσμάτων. Επίσης, ως ανατροφοδοτικός μηχανισμός οδηγεί στον ακριβή καθορισμό της ζώνης λειτουργίας τεμαχίων και διαδικασιών και κατ’ επέκταση της λόγιας και της μη λόγιας ζώνης, καθώς και της νόρμας. Η προαναφερθείσα διαδικασία εκκινεί από ένα διαγνωστικό πείραμα, που θα κατευθύνει την περαιτέρω έρευνα του θέματος, και από τα πρώτα ενδεικτικά αποτελέσματα της χρήσης του μεθοδολογικού εργαλείου V&V bar,

**Key Words:** learned register, V&V bar.

# 1. INTRODUCtion

The main issue this paper addresses is that of the Vougiouklis&Vougiouklis bar (V&V bar) as a new statistical tool of measuring, among others, the grade of learnedness in CMG. First, there is a detailed presentation of the tool and some of its advantages as compared and contrasted with similar tools widely used such as Likert scales and other types of bar. This is followed by an application of the V&V bar as a case study so as to measure the grade of learnedness of linguistic elements (segments, words and phrases). The grade of learnedness is defined on a continuum based on the results of a questionnaire, which was implemented to Democritus University students. Our ultimate goal is to argue and prove that the V&V bar will prove to be the most appropriate tool we have at our disposal when we want to identify gradings on continuums. Argumentation is derived from both the innate philosophical and strictly mathematically oriented method and from the results of the first application of the questionnaire and their preliminary codification

**2. SCALES AND BARS AS STATISTICAL TOOLS**

The use of mathematical models in linguistic research reached its peak in the mid-20th century with Zellig Harris, whose main purpose, as mentioned in Lentin (2002), was to establish linguistics as a product of mathematical analysis of linguistic data. Harris’ students include, among others, N.Chomsky, the founder of Generic Transformational Grammar, and M. Gross (1972), who developed the theory of mathematical models in linguistics.

Nowadays either direct or indirect correlation to a mathematical model is a prerequisite in almost all linguistic fields because the structures used in linguistics can possibly be more comprehensible and easily adapted through theuse of mathematical models. Moreover, the mathematicalisation of the problems leads to comparability and comprehensibility of the results. Depicting a research theme or phenomenon with numbers, is the simplest and most recognizable way of reading the results. Moreover, the fact that mathematics offer reliability, creates reliability and wider acceptance. Likert scales are mathematical models very widely used in almost every empirical research, including linguistic, especially with filling in of questionnaires.

2.1. Likert scale

The main stages of an empirical research are considered to be the following three: (a) design, (b) implementation, and (c) processing of the results. Main tools in an empirical research include *the questionnaire,* where Likert scales are normally and widely used.

In the stages of design and implementation, the scaling of a variable depends on both its nature and the judgment of the researcher (Zadeh1975). Likert scales are often used to measure respondents' attitudes by asking the extent to which they agree or disagree with a particular question or statement. A typical scale might be *"strongly disagree, disagree, neither agree nor disagree, agree, completely agree*". The Likert scales are characterized by necessary elements-rules which normally identify such scales, that is, they start from the absolute negative and end up to the absolute positive, or vice versa. However, the most serious problem constitutes the discrimination of the limits of the actual partition. This problem of discrimination of the different categories is not at all an easy process and could often be frustrating both for the researcher and the participants. More specifically, during the stage of the questionnaire design there might be inherently certain issues to be dealt with, such as:

* The range of the scale is not standard, and it is the researcher who needs to decide on the number of the subdivisions. There might be cases when researchers, trying to overcome certain problems, such as greater concentration of the answers in the middle of the scale, choose a scale with no medium choice such as a 4/point scale “sure, almost sure, not so sure, no sure at all”, narrowing down the options of the interviewees, excluding an alternative they might have preferred and depriving them of the possibility to explore other parameters. Clearly it is the kind of research that will always dictate the type of scale to be used, however if the researcher wants to investigate some other parameters s/he had not provided for well in advance investigating some aspects from a different point of view, s/he will have to re-apply the test with a different scale. In this case, though, s/he will have to begin the process of familiarization of her/his subjects with the new categorization again. In this case, though, he will have to begin the process of familiarization of his subjects with the new categorization. Consequently, in every case, the problem is the establishment and evaluation of the ‘unit’.
* The difficulty of refining the difference between different subdivisions and making them clear to the participants, especially to less sophisticated ones. It concerns verbal distinction and this is not at all an easy process, as many researchers report that it takes their subjects more time to comprehend what each subdivision represents on their scale, asking for extra explanations and examples, rather than accomplish the actual test. Such a problem involves a number of different factors including social and psychological. For example, the difference between ‘good’ and ‘quite good’ is not the same for every culture and even for each of us. Also, the options “*absolutely sure, sure, between sure and unsure, rather unsure, absolutely unsure*” and “*always or almost always true of me - generally true of me* -*generally not true of me- never or almost never true of me”* are not easily explained or defined, before conducting a questionnaire, especially with younger and/or unsophisticated participants. Additionally, it is possible that a participant might perceive the difference in one question but not in another, i.e. they are asked to adapt themselves to the specific type of categorization in every single question. Such a process might affect the reliability of the specific results, or, even worse, it might yield misleading outcomes. Such a situation, apart from being completely unpleasant and frustrating might question even the reliability of the actual test, as mentioned above. Humorously talking, the researcher might have to employ an extra parameter, that of the reliability of the answers in order to test whether the participants’ familiarization with the type of the questions affects their responses

In the stage of processing the results, the researcher that has used a type of Likert scale, e.g. 5 point scale, will only have one possibility of processing, the one he decided to establish when he initially designed the questionnaire. Such a decision, though, might deprive her/him of the possibility to explore other parameters which might come up in the process, or even try different subdivisions for either a more accurate estimation or in order to make his/her results comparable with somebody else’s who has used a different scale, as mentioned above.

Therefore, if one needs to have comparable results, he should re-apply the research using the same questionnaire, with the same participants, but a different scale. The shortcomings of this are: (a) the practical issue of having the same participants, on a specific day, which is very hard to do, and (b) even if the same participants are gathered, some of them, or all, might remember some or all of the questions and therefore there will not be spontaneous answers, on top of fatigue from the repetition of the same questions, resulting in waste of time and effort.

* 1. Bars

In order to eliminate these shortcomings of Likert scales, many researchers includingGu & Hu (2003), Nietfeld et al. (2005), Cao and Nietfeld (2005), and more recently Lu &Bialystok (2013) have tried another type of mathematical model, that of the bar, using different scales such as the 10, 20 and 100 point scales. Nevertheless, we observe that none of them has used an actual continuum in the strictly mathematical sense, since partitions, however detailed, are used. The real sense of a continuum is the complete absence of any partition. This shortcoming has come to remedy the Vougiouklis&Vougiouklis bar.

More specifically, Kambakis-Vougiouklis&Vougiouklis (2008) proposed the replacement of the scales with the 'bar' which facilitates both the subjects to provide answers, as well as researchers with the processing of the results. Here, however, the suggested tool, the bar replacing the scales, has nothing to do with the bars suggested by other researchers mentioned above. The V&V bar is inspired by the theory of fuzzy sets (Zadeh, 1965) and may open a window for further research on the field of science and linguistics:

"*When filling in any questionnaire, it is proposed to replace any scale with a continuum, that is, a bar called Vougiouklis&Vougiouklis bar (V&V bar). 0 is on the left end of the bar and 1is on the right:*

0 1

*The respondents, instead of checking a point on a Likert scale, are asked to intersect the bar vertically, on the point which they consider to express their spontaneous reaction to that question*".

Lygeros (2009: 1) refers to the advantages of the bar:

"*The innovation of the Vougiouklis&Vougiouklis bar (V&V bar henceforth) in replacing the scale from the bar has deep roots in the controversy between continuous and discrete. The tool they propose is not an extra addition to the mass of tools ... the V&V bar tries to overcome, in an artistic mathematical way, the methodological problems of simplification that are created by a model such as the Likert scale .... With the bar, it is easy to apply all the techniques of various distributions like Bernoulli, Poisson and Gauss the bar can also act as a tool for controlling the possibilities of all forms of scales*”.

Markos (2017) also emphasizes the obvious advantage of the V&V bar, that the researcher will not have to decide about the parameters in advance nor to clarify fine differences between subdivisions. In this way, the continuous data can be transformed into a form comparable to that of the categorized data allowing analyses identical to those done with questionnaires using conventional scales, even more so with a variety of partitions.

Furthermore, the participants, when asked to answer, do not need any special instruction, and do not need to distinguish the inconspicuous differences between two subdivisions on the scale. The psychological factor plays a very important role because the participants will intersect the bar [01] with a vertical line, based primarily on their intuition, which, at that particular moment, determines the most accurate point. The bar gives the possibility of fuzzy attitude, since it basically calls for a map on linear segment [0,1] instead of a 0 or 1 answer. To make things comparable, this process can be represented as the effort of a car to go up or down (a) an inclined level, i.e. the bar, or (b) a flight of stairs, i.e. the Likert scale. Similarly, it can be compared to a person’s using a wheelchair effort to get on a plane using a ramp, rather than a flight of stairs.

Consequently, when it is necessary to choose from a list such as “*very good, good, fairly good, almost good, not really good, not good, not good enough, rather bad, not very bad*”*,* etc -of course there are even more options- we cannot be sure that we will be able to explain the extremely subtle differences between escalations and make them completely distinguished from other similar choices making them in this way comprehensible all our participants of different ages, genders, and linguistic, cultural, religious beliefs. However, using a continuum, the V&V bar, instead of a predefined discrete, it is each individual who will decide where exactly to intersect the bar at a specific moment, without any subjective language explanations. Because, one could argue that through explanations, we might impose, involuntarily or voluntarily our own perceptions on the participants, something that is both wrong and undesirable.

The first pilot applications of the bar revealed certain inconsistencies, for which colleagues suggested solutions: (a) it was observed that the length of the bar was not strictly decided in advance; instead, it was left to the researcher's judgment. Such freedom, though, eliminated comparability between researches using bars of different length, and (b) even more so, if the length was kept too short, then the subject’s freedom of choice is limited, because they do not have enough space to make their choices. In order to tackle these two inconsistencies, it was suggested that the length of the bar should be kept 100mm in every application of the bar.

**0 1**

Figure 1: The 100mm bar

Nevertheless, in consequent pilot studies, three more inconsistencies were identified: (a) the average participants are over-familiarized with the widely used decimal system, that is to say, with the length of the ten centimeter bar, and (b) they are most likely to have certain schemata in their minds of scales of three, four, ten, or even twelve partitions in mind, since these are the ones widely used in western dominant decimal system. So, they were ‘programmed’ to move comfortably on a 10cm bar and cut it in the predetermined spaces they had in their minds. In other words, they subconsciously divide the bar into ten equal parts and act as if it worked on a Likert scale. The final inconsistency concerns comments that the 10cm bar was far too long and difficult to handle on the average A4 sheets of paper normally used in handouts.

The suggested answer to this problem was the use of the *golden ratio,* as suggested by ancient Greeks. It is defined to be *the segment x such that for a given length a to have a/x=x/(a-x).* So, in the case of the ten centimeter bar, this is represented as 100 / x = x / (100-x) and the solution of this equation is x≈62.0 mm as shown in the following figure:

1. 1

Figure 2: The 62 mm V&V bar

In this way we avoided the rather awkward 100mm bar and all the preconceptions of decimal system establishing an original length, never used before, and activating the advantages of the continuum of V&V bar, more specifically those of the continuum.

To sum up the V&V bar is aiming to overcome, in a skilful mathematical way, methodological shortcomings of simplification created by a model such as the Likert scale. Even more so, working on a continuum is a realistic simulation of human choice and consequently more natural. This is because the continuum is a common feature of all natural magnitudes, e.g. sound, and it is humans who cut every continuum into discrete units. Consequently, in the case of the bar, the participants are given the initiative to make a completely free choice rather go for ~~the~~ pre-determined ones. ~~Actually~~ Needless to say their choices are infinite as any point on the continuum may represent their options the specific moment.

Now we come to the final stage, that of the processing the result obtained using the V&V bar. The procedure to be followed is exactly the same as the one followed with any Likert scale. That is to say, we can divide the bar in as many equal spaces as we wish. One could ask: “why should we go through the bar procedure then?”. The answer is that our bar gives a potential for different types of processing not provided by the Likert scales, i.e. multiple processing.. For example, let us suppose that the researcher finds out that the given answers follow the Gauss distribution and wishes to ‘correct’ this tendency.

We have analogous classes using the Gauss distribution which are as follows (Vougiouklis&Kambakis-Vougiouklis 2011) in mm:[[1]](#footnote-2)

for 3 classes with limit values 0 – 27 – 35 – 62

for 4 classes with limit values 0 – 25 – 31 – 37 – 62

for 5 classes with limit values 0 – 24 – 29 – 33 – 38 – 62

for 6 classes with limit values 0 – 22 – 27 – 31 – 35 – 40 – 62

for 7 classes with limit values 0 – 21.5 – 26.0 – 29.5 – 32.5 – 36.0 – 40.5 – 62.

The case we set now as the main point of our paper, is the following: We suppose that the researcher consider that the answers are decreasing, say, for example, for psychological reasons, from the left to the right side of the segment [0,1]. One of the models to represent the situation is the decreasing parabola x=1-y2. In order to correct (normalize) the results we can divide the continuum [01] into equal-area spaces according to the above decreasing parabola distribution. This can be done by dividing the segment [0, 62] in equal-area spaces as follows:

For the ***increasing low parabola***, in its canonical form: x=y2, we have the following segments, in mm:

for 3 classes with limit values 0 – 43 – 54 – 62

for 4 classes with limit values 0 – 39 – 49 – 56 – 62

for 5 classes with limit values 0 – 36 – 46 – 52 – 58 – 62

for 6 classes with limit values 0 – 34 – 43 – 49 – 54 – 58 – 62

for 7 classes with limit values 0 – 32 – 41 – 47 – 51 – 55 – 59 – 62.

A second case is the ***increasing upper parabola*** which is represented by 1-y=(1-x)2, and it is symmetric to the above with respect to the point (0.5, 0.5). Then we divide the segment [0, 62] in equal-area spaces as follows, in mm:

for 3 classes with limit values 0 – 32 – 48 – 62

for 4 classes with limit values 0 – 27 – 40 – 51 – 62

for 5 classes with limit values 0 – 24 – 35 – 45 – 54 – 62

for 6 classes with limit values 0 – 22 – 32 – 40 – 48 – 55 – 62

for 7 classes with limit values 0 – 20 – 30 – 37 – 44 – 50 – 56 – 62.

The corresponding decreasing cases are symmetric, to line x=31, therefore the results are symmetric. More precisely we have the cases:

For the ***decreasing low parabola***, in its canonical form: y=(1-x)2, we have the following segments, in mm:

for 3 classes with limit values 0 – 8 – 19 – 62

for 4 classes with limit values 0 – 6 – 13 – 23 – 62

for 5 classes with limit values 0 – 4 – 10 – 16 – 26 – 62

for 6 classes with limit values 0 – 4 – 8 – 13 – 19 – 28 – 62

for 7 classes with limit values 0 – 3 – 7 – 11 – 15 – 21 – 30 – 62.

A second case is the ***decreasing upper parabola*** which is represented by 1-y=x2, we have the following segments, in mm:

for 3 classes with limit values 0 – 14 – 30 – 62

for 4 classes with limit values 0 – 11 – 22 – 35 – 62

for 5 classes with limit values 0 – 8 – 17 – 27 – 38 – 62

for 6 classes with limit values 0 – 7 – 14 – 22 – 30 – 40 – 62

for 7 classes with limit values 0 – 6 – 12 – 18 – 25 – 32 – 42 – 62.

**2. CASE STUDY: DEGREE OF LEARNEDNESS IN CONTEMPORARY MODERN GREEK**

V&V bar has been very successfully applied quite a few times in empirical researches[[2]](#footnote-3). Nevertheless, the possibility of mapping on a continuum comprises, on the one hand, a real challenge for statistical analysis and on the other a necessity for linguists. This is true even in the marginal case of three-grade categorizations on a continuum where two of the grades pinpoint the two poles of the continuum and the third is somewhere in between, closer to or further from one of the two poles. Such a case is the distinction of the characteristic [+/- learned] in Contemporary Modern Greek (henceforth CMG) in Anastassiadis-Symeonidis&Fliatouras (2004, 2018)[[3]](#footnote-4) where it is suggested a map on the [01] continuum, whose two poles are pinpointed by [+learned] and [-learned], while the norm of Modern Greek, the unmarked [+/-learned] variety lies somewhere in the space in between. Similarly, according to Anastassiadis-Symeonidis&Fliatouras (2018), the learnedness continuum as a hyponym of the typical/formal register functions on flexible zones (+learned - learned) with overlapping distribution in the norm and the learnedness degree differs on a case by case basis per segment and per derivative of the segment:

+formal norm -formal

---------------------------learned zone---------------------------

-------------------------non-learned zone----------------------Figure 3: Continuum of learnedness by Anastassiadis-Symeonidis and Fliatouras (2018)

Hence, we thought it would be of great interest to investigate whether and to what extent the V&V bar might prove to work more effectively than other methods previously used in measuring learnedness. The participants were forty students from the Department of Greek Philology and forty from different departments not language oriented, all at the first year of their studies at Democritus University of Thrace. They were asked to fill in a questionnaire of fifty phrases with learned elements by cutting the V&V bar at the point they thought the learnedness of each specific element lay on the continuum[[4]](#footnote-5). The specific bar represents the learned zone~~,~~ that is to say from the learned register to the norm.

01

Figure 3: The V&V learned zone

The fifty target learned elements of our questionnaire aim to equally represent the most productive noun categories in phonology, morphology and vocabulary as well as various semantic/pragmatic criteria such as irony, humor,[[5]](#footnote-6) etc., and, to a certain extent, various speech acts (see Αnastassiadis-Symeonidis 2004, 2018; Kamilaki 2009; Anastassiadis-Symeonidis 2015). In certain cases there were included competitive examples mainly at grammar and to a lesser extent at register level, as well as examples that are representative of more than one categories. It should be noted that the specific experiment was rather diagnostic, based on general examples, decontextualised from any pragmatic context so as to identify the function trends that further research will be channeled to. The learned categories examined via convenient sampling are the following (the targets are in brackets and the learned items are in bold type):

* Consonant clusters: *Δenθelonavreθο se (****pt****oxokomio)* ‘I do not want to be in a (poorhouse)’
* Stress: *Imefititistu (Δimokrit****i****uPanepistim****i****u) Θrakis* ‘I am a student of the (Democritus University) of Thrace
* Adjectives:

1. Plural genitive: *I δietatu (asθen****us****)ineipoxreotiki* ‘The diet of the (patient) is compulsory.

(b) Feminine ending in -*α*: *Θaerθis tin (Kaθar****a****) Δeftera*; ‘Will you come on (Pure) Monday’

* Nouns:

1. Singular genitive: *Θaaγorasoena stroma (θalass****is****)* ‘I will buy a sea (mattress)’
2. Obsolete dative: *Ineγnosto (****tis pasi****)otiinekalos* ‘It is known to [everybody] that he is good’
3. Vocative: *Kirie(****Kaθiγita****), sasefxaristo* ‘Thank you, (Professor)’

* Stem allomorphs:

(a) Compounding: *Ιne (****pasi****fanes) oti se aγapai* ‘It is (crystal) clear that (s)he loves you’

(b) Derivation: *Θa to perasosto (****ear****ino) eksamino* ‘I will pass it in (spring) term’

(c) Reduplication: *Aftiiγrami ine (****te****θlasmeni)* ‘This line is a (crooked) line’

* Affixes/Affixoids: *Aftosine (****imi****θeos)* ‘He is a (demi)-god’
* Words: *(****Anekaθen****)suareseaftos* ‘You have (always) liked him’
* Phrases: *(****Ek ton on ukanef!****)* ‘(sine qua non)’.

Judging from the results, the V&V bar seems to be the most effective method to manage the arrangement of the elements on a continuum, and in the specific occasion of the learned elements in accordance with the learnedness degree, for at least two obvious reasons:

(a) it is a unique methodological tool as it is so ‘sensitive’ to predict the (minor) differentiations in the answers per learnedness category as well as per example. These (minor) differentiations might not always be statistically significant yet they might be of vital importance from an interpretative point of view, at a theoretical level. This means that the V&V bar can lead to the most efficient arrangement of the elements, procedures and isolated examples on the continuum, and to some more ‘philological’ discussion between competitive elements and those which belong to the same category, the adjacent and the outlying ones. See for example the statistical results of the sampling examples (see above) with emphasis on the order of classification on the continuum (first column):

Table 1: Questionnaireresults[[6]](#footnote-7)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Phrase** | **Mean** | **SD** |
| 1 | **Ek ton on ukanef!** | 53.10 | 14.91 |
| 5 | Ineγnosto**tis pasi**otiinekalos | 45.09 | 16.25 |
| 11 | Ine**pasi**fanesoti se aγapai | 42.55 | 17.50 |
| 15 | **Anekaθen**suareseaftos | 40.20 | 12.94 |
| 22 | Δen θelonavreθοse**pt**oxokomio | 36.44 | 17.36 |
| 23 | Θa to perasosto**ear**inoeksamino | 36.18 | 14.25 |
| 24 | ImefititistuΔimokrit**i**uPanepistim**i**uΘrakis | 36.00 | 15.51 |
| 27 | I δietatu*asθen****us***ineipoxreotiki | 34.43 | 15.00 |
| 30 | **Kirie Kaθiγita**, sasefxaristo | 33.03 | 17.21 |
| 36 | Θaaγorasoena stroma θalass**is** | 27.38 | 14.46 |
| 39 | Θaerθis tin Kaθar**a**Δeftera; | 25.00 | 15.09 |

(b) It reinforces and/or breaks new grounds for reconsideration and more accurate description of the [+/-learned] characteristic. For example, it creates conditions for the definition/redefinition with mathematical accuracy of the remarkable points on the continuum, not on the basis of linear criteria but of the results of the test themselves. In other words, the V&V bar functions as a feedback mechanism because, based on the results, it can accurately define the norm point, which traditionally has been arbitrarily placed in the middle of the continuum. In this way it is easy to define the accurate zone of function of the learned and non-learned zones overall as well as the minor categories and segments.

In this way, by conducting specialized experiments with a good number of examples for each item, e.g. the item *pan*-, taking into consideration all the factors that define the degree of learnedness, and calculating the deviation degree depending on the points of concentration of the answers, we can define the learnedness zone of the specific item on the continuum in a mathematical way, e.g. the Gauss distribution. Then, the learnedness zones of the items belonging to the same (sub)category will lead to the calculation of the learnedness zone of the whole (sub)category while, finally, the learnedness zones of the hyperonym categories (morphology, syntax, phonology and vocabulary) will lead to the calculation of the norm zone and the learnedness zone.

**4. CONCLUSIONS**

It is no doubt that there is still a long way towards the complete study of the factors that might affect the learnedness degree of CMG. Even more so, research begins with the choice of an efficient methodological tool and from the design and implementation of a diagnostic experiment to direct the research. The traditional Likert scales are not effective enough for measuring continuums mainly because of inadequate design and insufficient mathematical processing of the results. The V&V bar proves to be more appropriate than Likert scales because, apart from the obvious advantages concerning the procedure of implementation of the test and the detailed distribution it offers, it yields most accurate results based on mathematical models depending on deviation and concentration of the individual answers and is more sensitive, too. As far as the degree of learnedness is concerned, it blazes a trail for an extended philological analysis of the results that will compare types, categories and competitors.

Furthemore, a more assiduous and closer study of the results of the specific questionnaire per hyperonym and per hyponym categories as well as per each individual element with emphasis on the deviations follows. This is done because the target is to organize and classify the two groups of criteria that define the learnedness degree, the etymological criterion in the sense of deviation/peripherality as well as fossilization, and the usage in the sense of representation of high /formal register, sequence and pragmatic use. For example, Fliatouras&Kabakis-Vougiouklis (to appear) find that the usage criterion seems to outmatch the other, that a good level in Ancient Greek influences favours the learnedness intuition, and that factors such as lexicalization, iconicity, spelling, pragmatic use, etc. might affect the learnedness degree. Moreover, it is vital to conduct more specialized experiments per category including more criteria such as gender.

To conclude, the creative coupling of theory and practice through the V&V bar is expected to lead to the feedback interpretation of the results with research emphasis on the accurate definition of the learnedness zone on the continuum of learnedness and function zone of the segments as well as learnedness categories. The contribution of the V&V bar might be invaluable as it offers multiple processing of the answers of the questionnaire ~~potential,~~ e.g. the Gauss distribution and the parabola.

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1. e have created similar analogous classes for all *increasing low parabola* and *decreasing parabola.* For a complete presentation see Vougiouklis & Kambakis-Vougiouklis (2011). NA ΣΒΗΣΤΕΙ. ΤΟ ΕΧΟΥΜΕ ΠΕΡΙΛΑΒΕΙ ΟΛΟΚΛΗΡΟ. [↑](#footnote-ref-2)
2. See, among others, Mathioudakis&Kambakis-Vougiouklis (2010), Kambakis-Vougiouklis (2012, 2013, 2016), Kambakis-Vougiouklis, Karakos etal. (2013),Kambakis-Vougiouklis, Makoumari et al. (2013), Kambakis-Vougiouklis & Mamoukari (2016a,b; 2017), Markos (2017). [↑](#footnote-ref-3)
3. The learned registerof CMG includes inherited or made-up segments, structures and procedures in all levels of linguistic analysis (Phonology, Morphology, Semantics, and Syntax) as well as the vocabulary which are prototypically employed in the typical/formal/high register. Usage is primarily concerned to be the basic criterion of learnedness while etymology, in the sense of grammatical/lexical deviation/peripherality and fossilization, is only compulsory. In many cases the learned items cannot be connected to any competitive variety or they seem to develop a specialized meaning or pragmatic use in comparison to their non-learned competitors (for more information and references see Setatos 1992; Charalampakis 1999; Anastassiadis-Symeonidis & Fliatouras 2004, 2018; Kamilaki 2009; Papanastasiou 2010; Fliatouras forthcoming).

   3 It must be clarified that the term *learned* was used while presenting the questionnaire as it was expected that all our participants were bound to be familiar with the term which is mentioned quite a few times in school handbooks. It was only pointed out that the term *learnedness* refers to grammatical deviations representing the level of formal usage (see inter alia Chatzisavvidis & Chatzisavvidou 2013).

   4Following the modern methodology requirements and to ensure the reliability of the research, certain distractors, i.e. non-learned items, were also used. [↑](#footnote-ref-4)
4. [↑](#footnote-ref-5)
5. For the relation between humour and learnedness, see Kamilaki (2012), Fliatouras and Koukos (forthcoming). [↑](#footnote-ref-6)
6. The first column represents the order of classification on the continuum of the fifty items in the questionnaire, the second column represents the phrase of the questionnaire (the target element is in bold type), the third column represent the average point of the participants’ cutting of the continuum while the fourth column represents the standard deviation. [↑](#footnote-ref-7)