DEFINING BEHAVIOR-ENVIRONMENT INTERACTIONS: TRANSLATING AND DEVELOPING
AN EXPERIMENTAL AND APPLIED BEHAVIOR-ANALYTIC VOCABULARY IN AND TO
THE NATIONAL LANGUAGE

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Verbal behavior, as in the use of terms, is an important part of scientific activity in general and behavior analysis in particular. Many glossaries and dictionaries of behavior analysis have been published in English, but few in any other language. Here we review the area of behavior analytic terminology, its translations, and development in languages other than English. As an example, we use our own mother tongue, Finnish, which provides a suitable example of the process of translation and development of behavior analytic terminology, because it differs from Indo-European languages and entails specific advantages and challenges in the translation process. We have published three editions of a general dictionary of behavior analysis including 801 terms relevant to the experimental analysis of behavior and applied behavior analysis and one edition of a dictionary of applied and clinical behavior analysis containing 280 terms. Because this work has been important to us, we hope this review will encourage similar work by behavior analysts in other countries whose native language is not English. Behavior analysis as an advanced science deserves widespread international dissemination and proper translations are essential to that goal.

Key words: behavior analysis, verbal behavior, terms, terminology, glossary, dictionary, translation, Finnish

Behavior is a link connecting an organism with its environment (Schnaitter, 1975). Verbal behavior is part of that link connecting a human with her social environment. Verbal behavior is also one of the main areas in behavior analysis (e.g., in scientific conferences), and has a dedicated journal, *The Analysis of Verbal Behavior*. Also, several “On terms” articles have been published in *The Behavior Analyst* over the years. Historically verbal behavior has been a controversial area within as well as outside behavior analysis (Hayes & Chase, 1991; Hayes, Hayes, Sato, & Ono, 1994). The very definition of verbal behavior has varied (cf. Hayes, Barnes-Holmes, & Roche, 2001; Skinner, 1957). For example,

among the first questions in this area is: Is all socially reinforced or governed behavior verbal behavior (as opposed to automatically reinforced behavior) or should the definition be more specific (Guerin, 1994; Hayes et al., 2001; Skinner, 1957)?

Among the main issues, these points stress the proper use of terms. As a science, behavior analysis requires a precise and technical terminology to move forward effectively; terminology is probably one of the few areas of our science in which truth by agreement is critical (Pritchard, Witts, & Watkins, 2011). By using terms unambiguously, behavior analysts can achieve economy of terminology and better replicate and extend research findings (Pritchard et al.).

Exact and fluent communication of concepts and terms referring to observable events will become even more important in the future as behavior analysis spreads throughout the world. With this dissemination and advancement translating and developing behavioral terminology into more and more languages will be necessary. Defining terms properly

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is critical to effective stimulus control of scientific verbal behavior. In this article, our aim is to describe and discuss the process of translation and the development of dictionaries of behavior analysis taking Finnish language as an example.

Many glossaries and dictionaries of behavior analysis are available in English, and these are also easily accessible to people whose native tongue is not English. But, aside from basic availability, mastering, developing, and translating a scientific verbal repertoire into a national language may be important to achieve other goals:

- (1) To be able to speak and write behavior analytically in one's native language. In this basic assertion, the most important point may be that with the native tongue the user remembers the terms most easily because of the many connections of meaning with other related words, the use of which is continually reinforced. This makes fluent use of the vocabulary more likely. Another related issue is that a language like Finnish, which does not belong to the Indo-European language family, includes words that are most likely not reminiscent of those words in the languages in which behavior analytic texts are more readily available. To the best of our knowledge, with the exception of Finnish, Japanese, and Chinese, all other glossaries are in Indo-European languages.
- (2) To make learning and understanding of behavior analysis easier for more people. Behavior analysts are aware of common misunderstandings of terms such as negative reinforcement and punishment. Exact definitions of terminology help to prevent such misunderstandings.
- (3) To ensure faithful translations from one language to another and equivalence of terms. Correct translations of terms—especially key terms—are important, of course, simply because faulty or erroneous translations may have significant consequences for the understanding of the terms. A significant example is from our country. *Beyond Freedom and Dignity* (Skinner, 1974), Skinner's only book so far to be published in Finnish, was translated in the seventies by a publisher who had no experts in behavior analysis

for consultation available. In the book, the term *contingencies of reinforcement* was translated as chance or random events! As you can imagine, this translation of perhaps the most important term in the book resulted in readers failing to understand Skinner's arguments. Consequently, Skinner's book as translated probably did not have the effect it might have had in Finland. However, it is no surprise that such mistranslations occur: For instance, the term *contingency* has also been difficult to translate into other languages (e.g., Icelandic; G. A. Ragnarsdóttir, personal communication, 2010). Terminological misunderstandings may have troublesome consequences for the formulation of research questions and hypotheses and for the application of methods and interventions. Moreover, they may lead to inadequate presentations of behavior analysis in the literature.

- (4) To function properly and survive, a language requires its own cultural environment—this is also true of behavior analysis. Scientific terms are discriminative stimuli for specific reinforced behaviors and for scientific practices most often unique to behavior analysis. Correct use of these terms helps to maintain and develop behavior analysis as an independent scientific discipline. Some word usages have survived and others have not, presumably because of their consequences (Catania, 1989). According to Catania (1989, p. 195) "...at least to some extent, the survival of a discipline must depend on the consistency with which its members pass its key terms and procedures to its students." He asks a further question (p. 195): "If the terms of a subject matter cannot be explicitly defined, how can they be passed on from a generation of students to the next?" Luckily, behavior analysis is in the position of already having a large, well-defined vocabulary. For those who value behavior analysis highly and regard it as the most rigorous and exact behavioral science yet developed, keeping its terminology concise and up-to-date is an essential goal.
- (5) To facilitate international cooperation within behavior analysis through a common language. When a behavior analytic

term is learned in the individual's first language, the corresponding English (or other language) term will be easier to select and, consequently, easier to write for international publication or otherwise communicate with other behavior analysts.

- (6) Verbal behavior in societies is in general mentalistic, and this limits the means to influence behavior. Behavior analytic terminology allows more precise and specific tating of phenomena. In applied and clinical behavior analysis especially, greater options for planning and conducting more precise interventions will be available when behavior analytic terminology is used, because behavioral events are more accurately described.
- (7) Finally, such dictionaries may help professionals to explain scientific issues to lay people in nontechnical language instead of jargon (Mayer, Sulzer-Azaroff, & Wallace, 2011, pp. 42–43).

BEHAVIOR ANALYTIC GLOSSARIES AND DICTIONARIES TRANSLATED FROM ENGLISH INTO OTHER LANGUAGES

Translations of selected operant terms into some “big” languages spoken by hundreds of millions of people have already been published in the *Journal of Experimental Analysis of Behavior*. Such translations are available at least in French (Richelle, 1960), German (Schaefer, 1960), Portuguese (Azzi, Rocha e Silva, Martucelli Bori, Fix, & Keller, 1963), and Spanish (Galleos & Colotla, 1980). These glossaries have been small, containing 80–186 terms in simple translations and, given the dates of these publications, may in certain cases be now outdated as well as certainly incomplete. Furthermore, these have often been thesaurus-type references, which give lists of words grouped together according to similarity of meaning (i.e., synonyms), and they do not contain definitions of terms as do proper glossaries or dictionaries.

In Europe, many development projects and translations of behavior-analytic terminology are ongoing today. We are aware of such efforts in France, Iceland (Ragnarsdóttir, Hauksson, Guemundsdóttir, Guðmundsson, & Karlsson, 2009), Italy, Poland, and Wales

(into Welsh). For instance, Welsh behavior analysts have already compiled a behavior analysis dictionary of 500–600 words (E. Walker Jones, personal communication, October 27, 2010). The Icelandic team has done extensive work on developing the Icelandic lexicon (Ragnarsdóttir et al., 2009). In other countries, glossaries or dictionaries of behavior analysis are available: Brazil (Portuguese: Teixeira Júnior & de Souza, 2006), Greece (Mellon, 2007), Japan (http://www.naruto-u.ac.jp/~rcse/s_baterms.html), Poland (Babel, Suchowierska, & Ostaszewski, 2010), and Norway (Løkke, Arntzen, & Løkke, 2010). Some unofficial glossaries are also available in other countries (e.g., in Germany; R. Schramm, personal communication, March 20, 2011). Certainly, non-English glossaries of behavior analytic terminology may exist that we are not aware of. The Behavior Analysis Certification Board (BACB) has published several international glossaries in the Internet (www.bacb.com): Chinese-to-English (provided by H. Feng), Greek-to-English (provided by R. Mellon), Norwegian-to-English (provided by G. Ree), Polish-to-English (provided by P. Babel, M. Suchowierska, & P. Ostaszewski), Portuguese-to-English (provided by R. Peleg, & N. Dias), and Spanish-to-English (provided by J. V. Ortega). An Internet dictionary, TermWiki, contains 1,220 terms of behavior analysis ([www.termwiki.com/Product_Category: Behavior_analysis](http://www.termwiki.com/Product_Category:Behavior_analysis)).

We have developed the first dictionaries of behavior analysis in Finnish¹: The first, a general dictionary of behavior analysis including terms of the experimental analysis of behavior and applied behavior analysis appeared in 2008 (Tuomisto & Parkkinen, 2008). Since then, this book has been published in two new editions (Tuomisto & Parkkinen, 2009a & 2011). The most recent edition contains 801 terms. Another dictionary was published in 2009 containing 280 terms used in applied and clinical behavior analysis (Tuomisto & Parkkinen, 2009b) that were included in all editions of our general behavior-analytic dictionary. These dictionaries include an English–Finnish glossary of all the terms defined in detail as well as a list of the

¹ Finland has three very old national languages: Finnish, Swedish and Sami (Lapp or Lappish) language.

most important English abbreviations in behavior analysis.

In this review, we describe the process of the development and translation of the terminology in the Finnish dictionaries. We address general issues of behavior-analytic term translation. This is part of our effort to contribute to the science of lexicology and semantics as related to behavior analysis. Our hope is to reinforce similar efforts of behavior analysts in other countries and provide potential discriminative control of scientific activities using some of our ideas and procedures for potential lexicographers in behavior analysis all over the world.

THE FINNISH DICTIONARIES OF BEHAVIOR ANALYSIS AND THEIR FUNCTIONS AS AN EXAMPLE OF TRANSLATION AND DEVELOPMENT OF A BEHAVIOR ANALYTIC DICTIONARY

The target groups for our dictionaries are: (1) our students of behavior analysis (aiming at the Board Certified Behavior Analyst examination), (2) students of psychology and psychologists, (3) other professionals in health care, social work, and education, (4) behavior analysts in other countries, and (5) others interested in behavior analysis.

Preparing the first editions of the two dictionaries required about five months' full time work: First each of us did translations separately for two months and then, in the final phase, took three months to develop the final descriptions together. As format models, we used Finnish dictionaries in general and Catania's (2007) *Learning*, in particular. We duly noted Michael's (2004) warning that "incorrectly used technical language is worse than common sense language because it suggests that the situation is well understood, and it may displace serious attempts at further analysis" (p. 165).

The choice of the sources for the words to be included in the dictionaries was determined by both theoretical and practical reasons; that is, the books containing the glossaries were assessed as high-quality and representative of our work as teachers and researchers within behavior analysis, and they were easily available to us or commonly used in teaching. At first, the Finnish behavior-analytic terms already existing in a domestic textbook

(Tuomisto, Lappalainen, & Timonen, 2005) and in our own teaching materials were included in the dictionaries. Then we used glossaries from several well-known textbooks such as Catania (2007), Cooper, Heron, and Heward (2007), Michael (2004), Miller (2006), and Miltenberger (1997). Terminology for Relational Frame Theory was obtained from the Association for Contextual Behavioral Science former Internet pages.

In addition to technical terms, we also included in the dictionary so-called mid-level terms, because these often occur in behavior analysis even though their definitions may not have been agreed upon or experimentally tested. These often refer to fairly comprehensive phenomena. One such term is *rule-governed behavior* (see, e.g., Hayes, 1989; Skinner, 1969, pp. 121–125). Furthermore, in a dictionary, the most straightforward explanations of terms may overlap with lay explanations. After all, behavior analysts should be able to explain their activities in regular parlance to everybody (*Behavior Analyst Certification Board guidelines for responsible conduct*: www.bacb.com/index.php?page=57). This most often presupposes the use of concrete rather than abstract terms.

In all our dictionaries the terms are presented in the following order: (1) Finnish term (in bold face), (2) corresponding English term in parentheses, (3) simple explanation of the term, (4) more complex explanation of the term with English abbreviations if necessary, (5) possible example(s) of use, and, (6) synonyms or alternative terms, and (7) more general or (8) more specific related terms (in capital letters). Most of the examples used in this review are from the work in the development of the dictionaries.

THE PROCESS OF TRANSLATION AND DEVELOPMENT OF THE DICTIONARIES: CHALLENGES, ADVANTAGES, AND FASCINATIONS IN CONSTRUCTING AND EDITING

We followed Catania's (1989) advice that "...behavior analysts should be encouraged that their subject matter remains coherent and well-defined and that their taxonomy of behavioral processes is expanding" (p. 195). In translating and developing Finnish behavior-analytic terminology—in addition to existing

conceptions—we adopted a problem solving approach (Fox & Faw, 2000; Skinner, 1969, pp. 133–171) with the aim of finding the best solution (term) from among several alternative Finnish words or combinations of words. In this process, the problem solving procedure involved comparing the candidate terms according to eight different criteria for a good term. According to our criteria, in addition to being behavior-analytic, a good term (and especially a good technical term) is (1) transparent: the important characteristics of the concept are easily derived, (2) consistent (logical) with the conceptual system (some words in use, which we discarded, were not), (3) relevant: it does not easily lead to negative connotations or associations, (4) distinctive: it does not overlap with another term in the area or another generally known term; that is, the terms must be mutually exclusive (e.g., *punishment* is a generally known lay word, but does not always have a functional meaning), (5) as short as possible (economy in expression), (6) productive: it is easy to derive related terms in the same language (e.g., *vaikute*–stimulus/*Finnish–English*), (7) easy to write, pronounce, and inflect, and (8) native if possible (i.e., consistent in topography with related words).

Several ways of word or concept formation exist (Ragnarsdóttir et al., 2009). We used all of these: (1) Combination: two or more word stems plus endings are combined (in Finnish, often also endings) (e.g., *suhdekehysteoria* = *Relational Frame Theory*). (2) Derivation: adding a prefix or suffix to a word or word stem (e.g., *vaikute* is now used in the meaning of *stimulus*, meaning *to influence* = *vaikuttaa*). (3) Adaptation: a loan word is adapted to a native grammar and phonological system (e.g., *respondentti*, *operantti*). (4) Old words acquire new meanings (e.g., *vaikute* as meaning *stimulus*; cf. *ärsyke* as “stimulus”; see also point 2 and below). (5) Neologisms (e.g., *heikenne* = *punishing* or *weakening stimulus*; stimulus serving as a consequence reduces the probability of a class of behavior, an instance of which precedes it). (6) Using several words or compound words which is sometimes necessary because it may be difficult to use only one word when a concept is translated to another language (e.g., *vahvistusaikataulut ja kiintiöt* = *schedules of reinforcement*).

To facilitate the reader’s understanding of the background to developing and translating behavior-analytic terminology into a national

language and to illuminate the work in one such context, we present a very brief description of the Finnish language. It is spoken by about six million people—five million in Finland, and one million elsewhere. It belongs to the Uralic language family² (a relatively small language family found mainly in the North East of Europe and Western Siberia in Russia). Three independent nations in Europe belong to the branch: Estonians, Finns, and Hungarians. About twenty ethnic groups or national minorities of the same branch exist in Russia.

Finnish is a good example of problems in translation from one language to another, because the language differs from Indo-European languages—it looks different, sounds different, and is written phonemically³—the language has an almost perfect match (equivalence) between letters and phonemes. Therefore, it is easy to read, spell, and pronounce because of the equivalence between the written style and pronunciation. It is “pronounced as written”—long vowels and double consonants are spelled out as in the words *see* and *spelling* in English. The vowel–consonant balance in the phonemes is quite even. In pronunciation, the word stress is always on the first syllable.⁴ Grammatically the language is rather complex. It is an agglutinative language which means that new words are formed through combination or adherence.⁵

²According to an old hypothesis, the Uralic languages are distantly related to the Altaic languages as shown by their many similarities. Thus, they would form a larger Eurasian language family.

³Some facts about the Finnish vocabulary and old literature: *The dictionary of modern Finnish* (15th ed., 2002) includes 201,000 headwords. *The corpus of old Finnish folk poems* (*Suomen kansan vanhat runot*), a series of books (started in 1915) contains 34 parts and 100,000 verses. About two million verses of old folk poetry were collected in the 19th century. Of these 1,250,000 have been published, 500,000 are unpublished. *Kalevala* (*Lands of Kaleva*), the national epic contains 22,795 verses and 50 cantos (*runo*) or “chapters.” *Kalevala* has been translated into tens of languages, including English. It is an excellent model of word formation and use with its specific literary style.

⁴In (very) emotional behavior, this may be different. In addition, English language has had some influence on the intonation of young people’s verbal behavior.

⁵As an illuminating example of this characteristic of the language, we take one from Wikipedia: *istua* “to sit down” (*istun* “I sit down”); *istahtaa* “to sit down for a while”; *istahdan* “I’ll sit down for a while”; *istahtaisin* “I would sit down for a while”; *istahtaisinko* “should I sit down for a while?”; *istahtaisinkohan* “I wonder if I should sit down for a while” [Finnish language. (n.d.)]

Consequently, the grammar with its 15 cases is very often based on inflection, declension and conjugation of the words, often instead of pre- and postpositions and particles (e.g., *in sauna* – *saunassa*, *from sauna* – *saunasta*, *to sauna* – *saunaan* etc.). In addition, long compound words are typical for the language (e.g., *intervallivahvistusaikataulu* – *interval schedule*). Conceptually and culturally it is quite Scandinavian (or Swedish) because of Finland's 800-year history as a part of Sweden, which means that natives of these countries categorize environmental phenomena quite similarly.

The process of translating and developing the dictionaries was very challenging, creative, and fun. We felt as if we were participating in an exam: We had to use all our “capabilities” in languages to the full. We translated the terms (and possible definitions) first and then developed and chose the final definitions of about 15 words in two hours—some terms required only a moment and were instantly found or translated, but other terms required 15 to 45 minutes to seek relevant additional supportive sources from the literature, developing the optional descriptions, and settling on a word. Each term found in several glossaries or dictionaries was discussed. We also discarded one common Finnish term as used today, a neologism that was originally developed for the general meaning of *stimulus* in the 1910s (*ärsyke-stimulus*; we replaced it with a term already existing in Finnish, *vaikute*). However, we may still use the former term, but in a more specific sense than before (a specific type of stimulus associated with irritating events). This meaning of the term is now consistent with the meanings of the family of words (with the word stem: *ärsy-* meaning to irritate) from which it originates.

We developed many new terms that are readily comprehensible to any native speaker of Finnish according to the rules of Finnish word formation (derivation, see above, e.g., *heikenne-weakeners* or *punisher*) and also changed the generality of some terms to a more specific use (e.g., *ärsyke-stimulus*; see above). We included words that we had needed in our own work or regarded as important and omitted some English terms that did not seem to require translation into our language.⁶ They

could be explained or understood directly in standard Finnish language as processes (verbs instead of nouns or reflexive or pronomial⁷ verbs instead of transitive ones) or events (e.g., randomness).

Because Finnish word formation is very flexible, some terms seemed quite easy to translate and develop and new terms can easily be generated and created from existing ones without loss of readers' comprehension. One method of forming new words—changing a verb from a transitive one to a reflexive or pronomial intransitive one—proved very useful. By using it and most often changing only one letter, it is easy to change a procedural term to a process term in Finnish (*vahvistaa-vahvistua* is equivalent to *reinforce-to be reinforced*; *ehdollistaa-ehdollistua*—*to condition-to be conditioned*). For instance, the term *reinforcement* (referring to a procedure and a process) can be separated into a procedural and a process term, respectively, by changing only one letter (*vahvistaminen-vahvistuminen*). The very term *behave* (*käyttäytyä*; reflexive verb) originates in Finnish from the word *to use* (*käyttää*; transitive verb) and means *to use oneself*.

Some terms appeared difficult to translate (e.g., *behavioral momentum*, *behavioral cusp*)⁸, because of the many meanings of the terms in different fields of science, none of them being overwhelmingly the most important one. Nor was it easy to find a word if, in our opinion, the English term was not totally unambiguous (e.g., *Relational Frame Theory*)⁹. In spite of this, functionally the Finnish translation may be adequate.

Some terms remain as internationally used loans in their form or topography (e.g., *refleksi*, *respondentti*, *operantti*—just add the letter i and sometimes double the consonant!). In Finnish language use, national purity of speech or text

⁷ The term refers to any verb form whose grammatical object is a reflexive pronoun. This type of intransitive verb is also called unergative, when it has an agent subject. The other type of intransitive verb, when the subject is not an agent, is called unaccusative.

⁸ We are grateful to Dr. M. Jackson Marr for helping us with these words.

⁹ A *frame* is one type of relation: an abstract set of limitations (as of circumstances or considerations) within which a thing or group of things is contained, in relation to which they are unified, or within which they acquire a usually particular or a typical significance or expression [Frame. (n.d.)].

⁶ It is interesting that these were often nouns that could simply be described as verbs or adverbs—see below.

is not absolute—quite a practical approach prevails—even if words that are not loans are favored over words of foreign origin. Moreover, to be useful and precise, some English terms that were single compound words were described with two or three words in Finnish (*korostettu korjaaminen* – *overcorrection*), but sometimes one compound word could conversely be equivalent to several English words (e.g., *Relational Frame Theory* – *suhdekehysteoria*).

One can argue that Finnish language in many areas of society may be more behavior analytic in its usage than English in that it is less noun-based and more verb-based than English¹⁰. This distinction is reflected in the English terms omitted from our dictionaries that could easily be described as verbs (processes) in standard Finnish language. Standard glossaries or dictionaries normally contain nouns, and verbs are offered as derivatives. When a noun is not considered as necessary, then the verb tends not to be in the dictionary. In another example, no impersonal subject is used in Finnish. If I want to say *it is raining*, I only say *raining*. However, this usage is confined to natural phenomena; with people, a more “mentalistic” description is easily expressed in Finnish.

Another major problem in the behavioral sciences is the potential terminological confusion between an intervention or procedure and its effects. These are often mixed up, or at least not properly discriminated.¹¹

One additional challenge in the choice and development of terminology is the existence of several different philosophies of behavior analysis, that is, several “behaviorisms” (see, e.g., O’Donohue & Kitchner, 1999). These have different approaches and slightly different versions of the same concepts and terminology (e.g., differences between Kantorian interbehaviorism and Skinnerian radical behaviorism, O’Donohue & Kitchner, pp. 87–89). Skinner’s radical behaviorism has been the most prevalent among these various “behaviorisms” and consequently, most of

the terms in our dictionaries originate from this tradition.

We also note that within psychotherapy an international project has been started in which therapeutic methods are described according to the therapist’s actions (what the therapist actually does, i.e., behavior) instead of from a theoretical perspective (Marks, Sibilia, & Borgo, 2010). Such an approach may help in making terms more understandable and avoiding mentalistic descriptions. Properly describing procedures and methods instead of theories in dictionaries is significant, because many commonly used popular terms and concepts have multiple meanings and thus potentially different behavioral consequences. One such term is *cognition*, and one needs to be able to distinguish how and when it refers to certain behavior–environment interactions, and when the term is used as a quasiexplanation for behavior (Robb, 1989).

During the development of the dictionaries, the option to grade behavior-analytic terms according to their level of precision appeared useful to us. For example, behavior-analytic terms could be graded as established technical terms, supported technical terms, controversial terms, etc. The level of precision of terms could help in the choice of relevant terms in different contexts. In the context of experimental research, for example, more stringent or precise terms and concepts are needed than in other contexts (e.g., clinical).

In English, controversy exists regarding a number behavior analytic terms. Consider *response cost* (e.g., Prichard, Witts, & Watkins, 2011). Response cost could mean contingent reinforcement loss (the loss of reinforcement contingent on a behavior such as fines; removal of toys; etc.), or it could mean contingent effort (overcorrection or positive practice), or response requirement (the amount of effort required to engage in the response). If a term is not sufficiently clear in its application in English, then translations need, at the least, to encompass the various uses. We have also applied this principle, for example, to some of the terms in three behavior analytic research traditions or theories of complex human behavior (i.e., equivalence research, naming theory, and relational frame theory). Translators would find it easier if these controversies could be reduced by some collaboration and project work within the behavior-analytic com-

¹⁰ A common tactic to render descriptions more behavioral is to change nouns into other constituent parts of a sentence, especially verbs and adverbs.

¹¹ As described earlier in this article, Finnish language makes it quite easy to discriminate between a procedure and its consequence or result by changing the verb from a transitive one to a reflexive or pronominal nontransitive one (see p.352).

munity that could clarify the terms and resolve some of the problems. We have followed some excellent examples of such collaborative symposia and talks at behavior-analytic conferences (e.g., Witts, 2011). International cooperation could also help in this endeavor.

As the work of translating and developing behavior-analytic terminology into our national language continues, we are considering adding other and new sources of terminology (e.g., Ferster & Skinner, 1957; Mayer et al., 2011). For this effort, we welcome any glossaries, dictionaries, encyclopedias or references that international behavior analysts wish to make available to us as well as to other behavior-analytic translators around the world.

Some further difficulties in this project are that in a small language community the printing of dictionaries may not be profitable as the circulation often is small, and electronic forms of dictionaries on the Internet are generally available free of charge. Therefore, the work is often simply "idealistically reinforced", for instance, by appreciative students; it offers professionals no economic benefits whatsoever.

There is no perfect state of affairs in scientific terminology, and behavior analysis as a science and technology is constantly evolving with new terms entering and some older ones changing in their application, or even being eliminated. Developing scientific vocabulary is thus a continuous, natural process of refinement and clarification. Catania (1989, p. 194) speculated that "...the vitality of a subject matter is demonstrated by the extent of its explicit concern with its vocabularies." We aim to continue to improve the work through feedback from our students of behavior analysis using the dictionaries. We also plan to consult with experts in Finnish language, recognizing that they often emphasize the topographies of words at the expense of their function. But these experts may guide us in finding new potentially useful terms through their etymological work that we have not identified. Also, as already indicated, we plan to expand the vocabulary further as well as to improve the quality of word definitions. The number of terms could easily be increased to more than 1,000. Our further ambition is to include glossaries from different areas of applied behavior analysis (e.g., special education, organizational behavior management,

behavioral pharmacology, behavioral medicine) and to publish separate dictionaries in these areas.

Our aim in this paper was to describe and discuss the process of the translation and development of dictionaries of behavior analysis using Finnish language as an example. We hope our efforts will encourage others in behavior analysis to prepare glossaries and dictionaries in their respective languages to enhance the international dissemination of the field—basic and applied. Finally, we wish to participate in international cooperation in dictionary development. Behavior analysis as an advanced science merits widespread international dissemination and proper translations are an essential component of that effort.

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