Questionnaire instrumentation for strategic vocabulary learning in the Swedish as a second language learning context

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Abstract

This article reports on the final round of piloting for a questionnaire instrument created and designed with the intention of collecting self-report data on adult, beginner Swedish L2 learners' use of vocabulary learning strategies. The *Swedish Vocabulary Learning Strategy Survey* (SVLSS) version 1.2 is distributed to 182 participants studying Swedish at institutes of higher learning in Sweden. The collected data set is subject to exploratory factor analysis to explore initial interpretations of the underlying constructs of the instrument, and analyzed for content validity and internal consistency. Readability and accessibility of the instrument is also addressed. Initial findings and interpretations are used to guide the development of a preliminary VLS taxonomy for the SVLSS, as well as suggest and perform revisions that will result in the SVLSS 2.0.

Keywords: second language acquisition; vocabulary learning strategies; Swedish language; questionnaire instrumentation

1. Introduction

In studying reported vocabulary learning strategy (VLS) use in second language (L2) learning contexts, questionnaire instruments are often employed to collect

wide amounts of data in relatively short time frames. These questionnaires have resulted in VLS lists and taxonomy that help to organize the strategies that learners use. Collected data can be interpreted using these classifications in order to examine VLS use patterns for research and diagnostic purposes. However, as pointed out recently by Gu (2018), VLS questionnaires seem to lack in explicit reporting on their creation, design, instrumentation, and validation practices.

As a means of exercising transparency in questionnaire instrumentation and taxonomy development, this study aims to perform validation analyses on the *Swedish Vocabulary Learning Strategy Survey* (SVLSS) instrument (LaBontee, 2016) using collected data from adult, beginner, Swedish L2 learners. Results and analyses provide guidance towards the proposal of a tentative VLS taxonomy that is, in turn, used to inform revision of the questionnaire item pool and to motivate an updated taxonomy for the next iteration of the SVLSS.

2. Literature review

2.1. Language learning strategies

Rubin (1975) described language learning strategies (LLS) as the "techniques or devices which a learner may use to acquire knowledge" (p. 43) in reference to observed behaviors that "good language learners" exhibited during their language learning. Oxford (1990) offered a classification system for LLS that distinguished between "direct" strategies which included memorization, cognitive and compensatory strategies, and "indirect" strategies that reflected strategic social and affective approaches, as well as meta-cognitive planning of language learning.

More recently, Oxford (2011, 2017) has departed from her six-category LLS taxonomy, instead offering a model that more strongly integrates a self-regulative model of language learning (i.e., Tseng, Dörnyei & Schmitt, 2006). The model classifies LLS into three dimensions, cognitive, affective and socio-cultural interactive, that operate interconnectedly on two levels: as meta-strategies that are performed to regulate planning, feelings and strategy use, and as the specific strategies performed with the intention of improving learning or completing a task. Oxford (2017) has attempted a holistic definition of LLS according to a meta-review of LLS research, describing them as diverse in form, purposeful, conscious, flexible in use, occurring situated in the contexts they are used in, and as teachable actions or learning behaviors (p. 48).

Considering the actual use of LLS, Gu (2018) stresses that strategic learning should be viewed essentially as a problem-solving process that operates in a cyclical fashion as new tasks arise. We analyze the task at hand, analyze our own resources for learning, analyze the context of learning to come up with a

plan of action, then monitor effectiveness of the plan while adjusting if needed, and then evaluating whether or not our efforts were successful when completing the plan (Gu, 2018, p. 326).

2.2. Vocabulary knowledge

If LLS reflect actions intended to help one facilitate learning *any* aspect of language, VLS are used to help facilitate the learning of *vocabulary knowledge* in a target language (TL). Vocabulary knowledge encompasses a many-faceted and complex system of word-related features that learners attend to when learning and using languages. In order to approach strategy use for learning vocabulary knowledge, some models used to classify L2 word knowledge will be introduced to illustrate what kinds of knowledge strategies can be used to help acquire.

Oxford and Scarcella (1994) investigated the schemata development for vocabulary knowledge storage in L2 learners, laying out an outline of "essential knowledge" for knowing a word. Their list illustrates a functional perspective of word knowledge as related to the learner. They list: form (pronunciation, spelling, word parts, morphology), grammatical use (plurality, pre-/affix, sentence construction), collocations (syntax of co-occurring words), discourse function in particular situations and contexts, shades of meaning (connotations), and receptive and productive uses.

Henriksen (1999) presents a more theoretically-anchored lexical knowledge model that occurs on three mutually interactive dimensions: partial-to-precise knowledge, depth of knowledge, and receptive-to-productive use ability. Partial-to-precise knowledge encapsulates a non-ordinal continuum referring to various registers of use for a lexical item, comprehension of that item, associations to that items, and forms that may be available to a language user. Depth of knowledge refers to the extent in which singular or stringed lexical units are linked in the lexicon via cognitive networks. *Depth* accounts for knowledge regarding a word's morphological, syntactic, and collocational profile, and its potential to carry meaning. The receptive-productive dimension assumes that lexical knowledge commonly moves along a continuum beginning with receptive knowledge (e.g., recognition/comprehension), gradually progressing to productive (e.g., spontaneous use). However, the receptive-productive dimension should be regarded as existing on a non-precise continuum rather than in dichotomous categories – one can retain lexical knowledge that can be used receptively and/or productively, and that knowledge may increase or decrease in either regard over time. On a functional level, Schmitt (2010) explains the dichotomy by stating that receptive knowledge contains *meaning* recognition and *meaning* recall, where productive knowledge contains *form* recognition and *form* recall.

Table 1 Nation's (2013, p. 49) word knowledge taxonomy

		Receptive	Productive
FORM	Spoken	What does the word sound like?	How is the word pronounced?
	Written	What does the word look like?	How is the word written and spelled?
	Word parts	What parts are recognizable in this word?	What word parts are needed to express the meaning?
MEANING	Form and meaning	What meaning does this word form signal?	What word form can be used to express this meaning?
	Concepts and referents	What is included in the concept?	What items can the concept refer to?
	Associations	What other words does this make us think of?	What other words could we use instead of this one?
USE	Grammatical functions	In what patterns does the word occur?	In what patterns must we use this word?
	Collocations	What words or types of words occur with this one?	What words or types of words must we use with this one?
	Constraints on use	Where, when, and how often would we expect to meet this word?	Where, when and how often can we use this word?

Nation (2013) organizes word knowledge into three major categories: form, meaning and use (see Table 1). *Form* refers to lexical features of spoken knowledge (i.e., phonetics), written knowledge (i.e., orthography), and word parts. *Meaning* refers to form and meaning (i.e., what does the word form inform about meaning), concept and referents, and associations (i.e., to related words, to synonyms). *Use* refers to grammatical functions (i.e., what patterns govern this word), collocations (i.e., words that tend to occur with or near each other), and constraints on use (i.e., register, frequency). The three dimensions of lexical knowledge are fluidly accessed during language learning and use, and are inextricably interconnected. Form, meaning and use knowledge features are expressed in Nation's model through both receptive and productive examples.

2.3. Vocabulary learning strategies

Second language vocabulary learning is a crucial factor for language acquisition at every level of proficiency, but is particularly important for beginner learners who must acquire large amounts of words quickly in order to access their new language. The difficulty and complexity of learning vocabulary requires the choice, and appropriate use of strategies that help and enhance the learning process. Gu (2003) notes that vocabulary learning strategies (VLS) should serve two purposes: to get more knowledge about words, and to be able to use that word knowledge productively. Oxford (2017) defines VLS as "teachable, dynamic thoughts and behaviors that learners consciously select and employ in specific contexts to improve their self-regulated, autonomous L2 vocabulary development" (p. 244).

Exploratory research into language learners' VLS use has resulted in a variety of taxonomy intending to classify different kinds of VLS. These taxonomy

are realized as strategy lists that have been purposed as questionnaire items to collect data on learners' reported frequency of VLS use. Gu and Johnson (1996) divided VLS into metacognitive regulation strategies and cognitive strategies on their 108-item Likert-scale *Vocabulary Learning Questionnaire* (VLQ). Metacognitive regulation represented strategic planning and self-regulation of learning, where cognitive strategies were further divided into guessing strategies, dictionary strategies, note-taking strategies, and memory strategies for both rehearsal and encoding. The VLQ also included a section of items probing learners' vocabulary beliefs regarding their learning situation, experience, and motivations. Recently, the VLQ taxonomy organization was updated, grouping components of the cognitive strategy category into initial handling strategies (strategies for establishing new word knowledge), reinforcement strategies, and activation (use) strategies (Gu, 2013). Also, the VLQ item list and construct structure have been revisited with the intention of evaluating and adjusting accessibility to non-English L1 participants, construct validity, and item list appropriateness (Gu, 2018).

Stoffer (1995) surveyed learners and colleagues for different kinds of VLS, populating a list that comprised her *Vocabulary Strategy Inventory* (VOLSI), a 53-item Likert-scale questionnaire. Unlike many other VLS lists she performed factor analysis on a data set collected from university-level English speakers learning a variety of L2s in order to investigate the underlying VLS constructs of the VOLSI, rather than presuming categories beforehand. Her taxonomy reflected VLS categories of: authentic language use, creative activities, self-motivation, creating mental linkages, memory strategies, visual/auditory, physical actions, overcoming anxiety, and organizing words.

Other questionnaires have sought to collect data on learners' perceived usefulness of VLS. Schmitt (1997) created a 58-item questionnaire that divides VLS into two categories based on whether or not the strategies were used to discover the meaning of a new word, or to consolidate a word after it had been encountered. Discovery strategies included determination and social strategies, and consolidation strategies included social strategies, memory strategies, cognitive strategies, and meta-cognitive strategies. Fan (2003) designed a questionnaire that would be used to collect both frequency of VLS use data and learners' perceived VLS usefulness data. Fan's 56-item Likert-scale *Vocabulary Learning Strategies Questionnaire* (VLSQ) closely resembled the VLQ (Gu, 2018; Gu & Johnson, 1996) with regards to overall taxonomy. The VLSQ involved meta-cognitive management strategies, source strategies, guessing strategies, dictionary strategies, repetition strategies, association strategies, grouping strategies, analysis strategies and known word strategies.

Table 2 A taxonomy of vocabulary-learning strategies (Nation, 2013, p. 328)

General class of strategies	Types of strategies
Planning: choosing what to focus on and when to focus on it	Choosing words
	Choosing the aspects of word knowledge
	Choosing strategies
Sources: finding information about words	Analyzing words
	Using context
	Consulting a reference source in L1 or L2
Processes: establishing knowledge	Noticing
	Retrieving
	Generating (creative use)
Skill in use: enriching knowledge	Gaining in coping with input through listening and speaking
	Gaining in coping with output through reading and writing
	Developing fluency across the four skills

Nation (2013) provides a three-category classification of different types of VLS: planning strategies, source strategies, and processing strategies (see Table 2). A fourth dimension, skill in use, encompasses strategy use but is concerned with the use of vocabulary input and output for both the enrichment of vocabulary *as well as* the development of the four skills – reading, writing, speaking, and listening. Planning strategies are used to choose what to focus on and when to focus on it, for example, choosing words, aspects of word knowledge, and strategies. Source strategies are used to find information about words, for example, using a dictionary, guessing meaning from surrounding context, or using background knowledge to guess meaning. Processing strategies are used to reinforce acquired knowledge through the use of noticing, retrieval and generation (productive activation). These VLS classifications are considered fluid depending on the actual use of a strategy according to the task being approached, context in which it occurs, and individual using the strategy.

2.4. Questionnaire validation

The use of questionnaire instruments as elicitation tools offers up a relatively quick and efficient method for collecting large scale self-report data on learners' LLS use (O'Malley & Chamot, 1990). These data can then be used to examine strategy use patterns amongst groups of learners through a variety of analytical approaches (e.g., Gu & Johnson, 1996; Fan, 2003). However, the most popular VLS taxonomies offered through VLS lists or questionnaires have not reported (published) validation procedures, as pointed out by Gu (2018) in a recent update to the VLQ.

Gu (2018) explains that questionnaires used to collect VLS use data assume that "strategies are latent sets and episodes of behavior that can be observed and described" (p. 328), and are represented by item statements on the questionnaire. A Likert-scale style questionnaire asks participants to respond to these

statements with how often they perform the represented strategic behaviors, then in turn uses collected responses to illustrate strategy use by individuals or groups of learners. Although perfect representation of the construct reflected by a questionnaire is near impossible, best representation of the intended VLS constructs with the statements presented on a questionnaire should be a goal of validation procedures. Gu (2018) points out that systematic review of statements in the item pool should be performed to ensure relevance and representativeness of the target construct(s), items constituting a single scale should represent consistency amongst themselves, and interpretation of collected scores should be used appropriately and with the intended population (p. 328-329).

Dörnyei and Csizér's (2012) chapter on questionnaire creation, use, and validation offers some guidance on approaching validity and reliability evaluation. They caution that item generation and/or sampling should be considered carefully with regard to the constructs that are intended for investigation. This requires a particular attention to the way statements are crafted, as "the wording of the questions assumes an unexpected amount of importance . . . [and] can produce radically different levels of agreement or disagreement" (p. 76). When generating questionnaire items, Dörnyei and Csizér (2012) suggest the use of exploratory data gathered from respondents using qualitative methods to generate item pools, or borrowing questions from other established questionnaires. When writing and revising the item pool, short, simple, unambiguous, single-question items that reflect the core construct studied are best. Further, following data collection, factor analysis and calculation of a Cronbach's alpha coefficient are suggested as methods for exploring and interpreting potential underlying factors that influence the interrelated correlations between items on an instrument, and for determining item homogeneity and reliability in a supposed thematic group, respectively (p. 85).

2.5. Swedish VLS context

Most studies exploring VLS use in the Swedish L2 context have done so in the context of public primary and secondary school Swedish L2 programs. For example, the *STRIMS-projektet*, a Swedish research initiative during the 1980's and 90's was concerned with performing exploratory research into the LLS used by students in classroom contexts at primary and secondary school levels (Tornberg, Öman, Bergström, & Håkanson, 2000). Other studies have gathered data concerning LLS or VLS use by young-to-adolescent-aged students in the Swedish school system as a component of establishing group or individual learning profiles of students (Allestam, 2007; Magnusson & Öggesjö, 2013; Malmberg, 2000; Wareborn, 2004). Findings of these studies suggest that younger Swedish L2 learners prefer

the use of memorization strategies over more creative (production-based) strategies, and that the use of strategies is influenced by contextual factors related to interest and relevance for word learning (i.e., multimedia, social media).

In the adult Swedish L2 learner context, Granberg (2001) used Oxford's (1990) 50-item *Strategy Inventory for Language Learning* (SILL) coupled with interviews to collect LLS use data from a single learner as part of a longitudinal, qualitative case study illustrating the Swedish language learning experience of the adult immigrant to Sweden. Sandh (2013) also used the SILL to investigate the VLS use of two groups of adult, mixed-proficiency Swedish L2 learners. The SILL is intended for exploring LLS, but was adapted by Sandh to investigate VLS use. Collecting data with an instrument that was not designed to collect a certain type of data, and in a context that was not originally intended for that instrument, can result in unreliable, misrepresented data (Dörnyei & Csizér, 2012). Her findings suggested that metacognitive and social strategies were most popular for vocabulary learning, while affective strategies were not often used. Learning profiles were proposed according to collected data that divided learners into expert vs. novice language learners, groups according to time spent studying, L1s and motivations.

3. The study

To the knowledge of this author, no large-scale research efforts have been undertaken to explicitly explore what VLS are used by adult, beginner Swedish L2 learners studying at Swedish institutes of higher education. Findings from such research would help to establish a starting point for better understanding learner groups in the adult Swedish L2 learner context, and could be used to develop reflective and diagnostic tools for educators in the field. In order to facilitate such research, a new instrument, the *Swedish Vocabulary Learning Strategy Survey* (SVLSS), has been created with the explicit intention of being developed for use and distribution with adult, beginner Swedish L2 learners. As a final part of an ongoing pilot process for the SVLSS (LaBontee, 2016; LaBontee, 2018), this study represents efforts to evaluate the SVLSS (version 1.2) with regard to accessibility, construct validity, and content validity. The primary question raised in this study is:

1.   What VLS constructs seem to be represented by the SVLSS instrument?

This question will be addressed through the use of exploratory factor analysis and subsequent interpretation of any factor groups found. A VLS taxonomy for the SVLSS will be proposed from these findings. Using this proposed model, a critical examination of the questionnaire items as related to their respective VLS groups will be performed:

2. Are all items on the SVLSS instrument relevant to and representative of the proposed VLS taxonomy?
3. Is the SVLSS instrument accessible to a range of English L2 users?

Any issues arising from investigation of the above questions will be addressed and adjustments will be made to the SVLSS instrument. The findings of this study, alongside instrumentation considerations related to VLS taxonomy occurring in the literature (LaBontee, in press), are applied to the SVLSS instrument, resulting in adjustments to its conceived VLS taxonomy and item pool.

3.1. The SVLSS (version 1.2)

Creation and development of the SVLSS were originally driven by the lack of an instrument designed explicitly to collect self-report data on adult, Swedish L2 learners'[1] VLS use. Creating an instrument for specific use in the planned context (rather than adapting another instrument) can help to better ensure that the data collected is the data intended to be collected, and that the instrument content is relevant to the surveyed demographic (Dörnyei & Csizér, 2012). The VLS use data collected by the SVLSS will be used to explore vocabulary learning patterns for groups and individuals learning Swedish as a L2. This information is intended to be used both in research contexts and for pedagogic purposes.

The SVLSS instrument used in this study represents the third iteration of the piloting process. The initial SVLSS 1.0 was the result of item pool generation based on content-analysis of qualitative data collected from the target audience that used semi-structured interviews paired with a vocabulary learning task (LaBontee, 2016). The SVLSS 1.0 was piloted for general accessibility regarding reading ease and item pool appropriateness, and was adjusted according to participant response data, and one-on-one feedback, resulting in the SVLSS 1.1. This iteration was piloted again using the same approach, and further refined for readability and item fit, resulting in the iteration used in the study at hand, the SVLSS 1.2.

The SVLSS 1.2 was distributed online using the *Google Forms*™ survey platform. The instrument uses Likert-scale response to statements ranging from 1 = Not true of me, to 5 = True of me. The SVLSS 1.2 contains 74 item statements written in English. All items were written with the intention of eliciting self-report data from Swedish L2 learners on their strategic vocabulary learning behaviors. In the current and previous iterations of the SVLSS, items were separated into 7 sections. Each section represented initial grouping themes during the content mapping of strategic behaviors as part of the item pool generation process

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[1] Heretofore referred to as "*the target audience*" or "*target demographic.*"

for the SVLSS 1.0. These arrangements were used to organize the SVLSS with the intention of contributing to ease-of-use and content comprehension for participants by grouping similar items into sections. The groupings were thematic according to their perceived VLS types: production strategies, investigation strategies, lexical-associative strategies, memory strategies, and motivation/planning strategies. Though these groupings were used to guide item list arrangement on the SVLSS 1.0, they were not displayed on the actual questionnaire. A detailed list of items listed on the SVLSS 1.2 can be found in Appendix A.

English language was used for this questionnaire due to its status as *lingua franca*, and due to its use in Sweden as a functional language of higher education. As all participants of this study were studying at Swedish institutes of higher education, they were all required to have (and reported having) intermediate-to-high levels of proficiency in their command of English language, and all felt comfortable with it as a mediating language with which to complete the SVLSS. Distribution of the survey to participants was administered by teachers of Swedish as a L2, language learning program leaders, administrators at the various institutes, and by the author, in-person. Students were asked to fill out the SVLSS outside of class and at their own pace.

3.2. Participants and collected data

Participants in this study were adults over age 18, living in Sweden, and studying Swedish as a second language at various institutes of higher education[2]. Participants were recruited from A1, A2 and B1 Swedish language classrooms, and all identified as "beginner learners" when taking part in the study. All participants volunteered their time to fill in the questionnaire, establishing a convenience sample for the study. The final number of participants who responded to the SVLSS 1.2 after data cleaning was 182.

A demographic survey preceded the SVLSS 1.2 instrument, probing participants for background and individual differences information. Participants' levels of education, their degree of multilingualism, their age, the time they have spent learning Swedish, the time they have spent living in a Swedish language dominant environment, and their native and other languages spoken were all surveyed. Collected demographic information for the participant sample is outlined in Table 3.

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[2] Sixteen institutions of higher education with Swedish as a Second Language instruction programs across Sweden. For privacy purposes, the institution names are not listed.

Table 3 Participant demographics information

Age group*		Time spent studying Swedish		Time spent in Swedish language environment		Education	
18-23	63	0-3 months	96	0-6 months	93	High School diploma	39
24-29	65	4-6 months	22	7-12 months	45	Bachelor's	66
30+	54	7-12 months	32	13+ months	43	Master's	50
		13+ months	30			PhD	27
Multilingualism		Native languages					
Monolingual	7	Germanic	72	(English, German, Dutch, Swiss)			
1 additional language	75	Romance	40	(Italian, Spanish, Portuguese, French, Catalan, Romanian, Basque)			
2 additional languages	52	Slavic	24	(Russian, Ukrainian, Polish, Czech, Serbian, Slovenian, Bosnian, Bulgarian, Croatian)			
3+ additional languages	48	Other	46	(Persian, Urdu, Dari, Finnish, Hungarian, Greek, Cantonese, Chinese, Thai, Latvian, Lithuanian, Japanese, Thai, Vietnamese, Turkish, Indonesian, Arabic)			

Note. Total sample *N* = 182.

Participants were mostly younger adult learners (under age 30), and the majority of them spent less than 12 months learning Swedish or living in a Swedish-language-dominant environment. Participants exhibited a wide range of multilingualism where, in fact, monolingual speakers were the overwhelming minority. Native languages reported were mostly Germanic or Romance languages, but were considerably diverse across the entire sample.

4. Analyses and findings

4.1. Factor analysis and interpretations

Exploratory Factor Analysis (EFA) is a statistical tool that is often used to explore the dimensionality of underlying constructs in questionnaire item lists. In L2 strategy research, it has been used to evaluate construct validity for several instruments such as Oxford's (1990) SILL (Park, 2011), the VOLSI (Stoffer, 1995), and the VLQ (Gu, 2018). EFA is explicitly used for exploratory investigations into underlying instrument constructs. As Osborne (2014) puts it, "EFA is an *exploratory* technique. As such, it should not be used, as many researchers do, in an attempt to *confirm* hypotheses or test competing models" (p. 6). EFA is used[3] here to provide guidance for two facets of instrumentation. First, it is used to examine the relationships between items on the SVLSS to help determine and interpret the dimensionality of VLS constructs that they represent. Second, the statistical relationships revealed by the EFA will be used to initially inform and guide revisions to the SVLSS 1.2 item pool.

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[3] EFA was performed using the Statistical Package for the Social Sciences (SPSS) program.

A Kaiser-Meyer-Olkin measure of sampling adequacy returned a result of 0.749, indicating that the sample size for this study holds "middling" acceptability for factor analysis (Cerny & Kaiser, 1977). EFA is performed here using principal axes factor extraction with a varimax rotation. Principal axes factor extraction allows for a choice of initial estimate of communality, and varimax rotation maximizes the variance within an extracted factor, making larger loading scores larger, and smaller scores smaller (Osborne, 2014).

A total of 22 factors were found with initial Eigenvalues greater than 1, accounting for 69.50% of the variance. A table outlining the initial total variance explained for the SVLSS 1.2 can be viewed in Appendix B. As the returned 22 factors failed to display clear breaks in explanation of factor variance, scree plotting was consulted to provide further guidance. The number of data points above the "elbow" in which the slope of the scree plot curve changes markedly can provide a good estimate of the ideal number of factors to retain (Osborne, 2014, p. 18). The Scree plot elbow-bends found in Figure 1 suggest testing for either a 3- or 6-factor level solution for extraction and analysis.
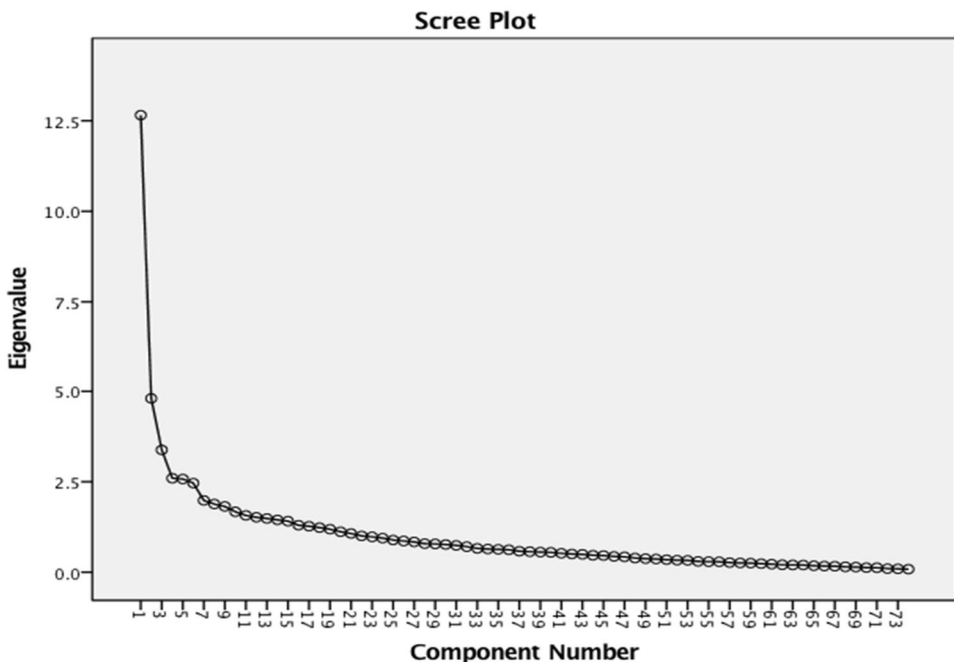

Figure 1 Scree plot

Rotating component matrices can be read to evaluate loading values in order to assess questionnaire items with regard to their contribution(s) to the factor constructs. Rotated component matrices were run to assess VLS item

loading scores. At the six-factor level, common features between items with adequately high loading scores were observed more clearly than at the three-factor level, leading to acceptance of the six-factor extraction. Factor loadings were cut off at the 0.3 level in order to control for initial fit. The six-factor rotated factor pattern can be viewed in Appendix C.

All items were grouped together according to the factor they scored highest on, though it should be noted that cross-loading was observed for most items. Some items did not necessarily fit the conceptual "theme" of the factor group that they scored highest on. This result was somewhat expected due to the still-nascent organization of the SVLSS item pool, and exploratory nature of EFA. Those items that did not obviously fit are discussed in connection with their respective factor groups below. It bears repeating that the purpose of the EFA here is not to confirm previously established questionnaire constructs, but to explore possible interpretations of the constructs emerging from analysis.

Table 4 Six-factor extraction interpretation

Factors and titles	Rotated Eigenvalue	% of variance	# of items
1. Memorization strategies	6.143	8.301%	17
2. Depth enhancing strategies (Use)	4.929	6.661%	12
3. Association-based strategies	4.926	6.657%	14
4. Depth enhancing strategies (Sources)	4.297	5.806%	12
5. Self-regulation and reflection strategies	4.257	5.752%	11
6. Lexical information strategies	3.923	5.301%	8

Initial evaluation of item groupings offered six thematic categories related to similarities between the types of VLS that clustered onto each factor. These item groupings were titled according to their core characterizations: memorization strategies, depth enhancing strategies through use, association-based strategies, depth enhancing strategies through sources, self-regulation and reflection strategies, and strategies that use lexical information (see Table 4 above for categories). Item lists[4] for each factor and interpretations for preliminary item grouping themes are reasoned below following corresponding tables that present the items included in each list (see Tables 5-10).

Factor one accounted for 8.3% of the variance with 17 items loading onto it. Many of the higher scoring items grouped on this factor reflected strategies that demonstrate the use of repetition to better retain already acquired or encountered word knowledge (ITEM 43, 44, 45, 46, 47, 50, 58). Less obvious repetition-based VLS items may have been interpreted by participants as repetition strategies, such as quizzing oneself [repeatedly] (ITEM 48), labeling items with

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[4] SVLSS item statements listed in Tables 5-10 have been paraphrased for display convenience.

L2 words [to view repeatedly] (ITEM 51), or organizing words into groups or lists [to review] (ITEM 61). Items also may have been interpreted through the statements' use of the word *review*, which potentially evokes repetition through study (ITEM 39, 43, 49, 58), and curiously does not appear in item statements that loaded onto the other factors. Issues of misrepresentation of item statements will be addressed in a following section regarding revision and adjustment of item statements.

Table 5 Factor one item list "Memorization strategies"

Item	VLS	Loading score
45	Write words down over and over.	0.678
43	Review words repeatedly over time.	0.613
46	Writing lists of words over and over.	0.597
48	Quiz self with word lists	0.579
58	Plan to review words in spaced intervals	0.574
61	Organizing words into groups/lists	0.538
63	Reflect on vocabulary learning in Swedish	0.53
44	Read words out loud over and over.	0.514
49	Review words or with others.	0.508
50	Use flashcards	0.502
57	Plan individual learning before/during/after study.	0.486
39	Mix up the order of words during review	0.463
47	Listen to recordings of words over and over	0.456
51	Labeling items (in home, workplace)	0.456
59	Plan to use free time to casually practice vocabulary	0.433
62	Paying attention to difficult Swedish vocabulary	0.429

Strategic word learning, in perhaps its most shallow but oft-practiced form, includes repetitive engagement with a word through viewing, hearing or verbalization in order to better remember it. This engagement is usually coupled with related information (e.g., a learner's L1 translation of the L2 word). Repetition-based strategies have been referred to as "repetition," "memory" or "memorization strategies" in LLS and VLS taxonomy (e.g., Fan, 2003; Gu & Johnson, 1996; Oxford, 1990; Schmitt, 1997). In Nation's (2013) taxonomy they fit into his processing category of VLS that involve noticing, retrieving and generating vocabulary knowledge.

Other items that loaded onto this factor that do not fit the theme in a more obvious way reference reflection or regulation of one's vocabulary learning (ITEM 57, 58, 59, 62, 63). One item did not score over 0.3 (ITEM 41), indicating a very weak correlation, although the item cross-loaded similarly onto several other factors. These items (and other instances of item-construct fit issues found in this section) are addressed in the following section regarding cross-loading of items across factors and item pool adjustments.

Table 6 Factor two item list "Depth enhancing strategies (use)"

Item		Loading score
13	Listen carefully for lexical information	0.643
1	Speak or write as much as possible	0.635
2	Using words in casual speech	0.622
15	Watch TV/film in Swedish/with subtitles	0.559
16	Watch TV/film without subtitles	0.533
14	Pay attention to useful/interesting words in everyday life	0.503
12	Read text to find new words	0.491
56	Use known words even though uncomfortable	0.49
6	Use words in familiar situations	0.479
3	Describe word meaning without saying the word itself	0.394
53	Motivation comes from natural interest in the language.	0.342
40	Remember words through common expressions/idioms	0.301

Factor two accounted for 6.66% of the variance and 12 items loaded onto it. The VLS that loaded onto factor two reflected strategies used for both finding new word information through attending to aural or visual target language input (ITEM 12, 13, 14, 15, 16), as well as the production of words to strengthen retention of vocabulary knowledge (ITEM 1, 2, 3, 6, 56). Strategies for finding and retaining new word knowledge are also seen in factor four, but lean more towards the use of context clues and previous knowledge for facilitation.

"Word depth" as related to the factor two and four VLS lists refers to the extent of which vocabulary knowledge units (which may occur in a variety of forms – morphological, syntactic, collocational, semantic, etc.) are linked to each other in the lexicon, and within one's cognitive network (i.e., Henriksen, 1999). VLS that reflect the expansion of word knowledge depth require complex, effortful networking of word knowledge features that can be facilitated through the production of vocabulary as a means of learning said vocabulary. Strategies of this kind have been classified as "authentic language use" and "creative activities" in the VOLSI (Stoffer, 1995), as "activation strategies" in the VLQ (Gu & Johnson, 1996), or as "social strategies" in Schmitt's (1997) taxonomy.

The factor two VLS list also contains strategies that are used to engage one's linguistic environment in order to find and learn new vocabulary knowledge, which also contributes to extending one's depth of vocabulary knowledge. These kinds of strategies are seen as "determination strategies" in Schmitt (1997), and "source strategies" in the VLSQ (Fan, 2003). The VLQ (Gu & Johnson, 1996) divides them into "dictionary strategies" and "note-taking strategies," as well as "using background knowledge or the wider context" and "using linguistic cues or the immediate context."

The two lowest scoring items in this list did not seem to fit the theme in an obvious way. ITEM 53 deals with an intrinsic motivation for learning words, while ITEM 40 considers the use of colloquial language for word retention.

Table 7 Factor three item list "Association-based strategies"

Item		Loading score
38	Associate word with time-related information	0.673
25	Associate word with key-words	0.589
37	Associate word with location word found	0.544
36	Associate tone or music to word	0.526
29	Connect other related TL/NL words to new/learned word	0.514
35	Connect images or pictures to word	0.506
34	Associate salient contexts (story/action/emotion) to word	0.493
31	Remember context word found in	0.45
17	Use pictures/gestures for comprehension of unknown words	0.445
32	Connect sentence context to words found in them	0.42
4	Create mnemonic phrases using word	0.406
5	Make up new sentences with word	0.397
30	Connect word to translation/opposite meaning	0.384
18	Connect word with its phonetics	0.336

Fourteen items loaded onto factor three, which accounted for 6.66% of the variance. The characterizing feature for most strategies in this group was that they operated through associating word knowledge with some kind of other information. This information involved time (ITEM 38), other words (ITEM 25, 29, 30), sound (ITEM 18, 36), imagery (ITEM 17, 25, 35), text (ITEM 4, 5, 32), location (ITEM 37), or a general sense of context (ITEM 31, 34).

Building associations between words and other kinds of information is another form of encoding word information for retention and future recall. These associations are intended to connect word knowledge to varied memory nodes, hopefully resulting in faster, more regular and more primed activation. Associations might involve linking new words to related words, concepts, grammaticality, visual/audio information, notes, kinesthetic actions, or tactile sense impressions such as musicality or tone (Gu, 2003; Oxford, 1990). Association strategies have been represented by other VLS taxonomy as "creating mental linkages through visual-auditory means, physical action and organizing words" by Stoffer (1995), "memory strategies for encoding" by Gu and Johnson (1996), and "association strategies," "grouping strategies" and "analysis strategies" by Fan (2003). These kinds of VLS, like memorization strategies in factor one, fall into Nation's (2013) category of VLS for processing information through noticing, retrieving and generating.

Although all items in this group could be fitted into the interpreted theme, some statements seemed to be pointing towards other strategy types, though may have been misinterpreted by participants. For example, ITEM 17 represents a strategy for finding new word knowledge, but may have been construed by participants as a strategy for associating picture/gesture information to known information for better retention. This class of ambiguity is discussed in the later section on item pool adjustments.

Table 8 Factor four item list "Depth enhancing strategies (sources)"

Item		Loading score
7	Note common/important words for later look-up	0.566
8	Use dictionary to look-up meaning	0.563
65	Reflect on error/accuracy of word use	0.495
11	Guess word meaning/pronunciation/spelling based on previous knowledge	0.485
9	Look-up words found in everyday life.	0.481
54	Motivation from other interests than the language.	0.478
42	Write down vocabulary notes	0.47
24	Use cognates	0.425
10	Ask others about word knowledge	0.389
33	Use previous exposure/knowledge of words	0.384
28	Connect Swedish words to NL words	0.359
60	Use technology to assist learning	0.32

Twelve items loaded onto factor four, which accounted for 5.80% of the variance. This item list seems to represent a kind of extension of the depth enhancing strategy types found in factor two, but with a focus on such strategies as those represented as "linguistic cues," "the immediate context," "dictionary strategies," and "note-taking strategies" as seen in Gu and Johnson's (1996) VLQ. The lion's share of VLS that loaded onto factor four represented strategies performed to establish new vocabulary knowledge through the use of note-taking (ITEM 7, 42), look-up strategies (ITEM 8, 9, 10), using previous knowledge (ITEM 11, 24, 28, 33).

Table 9 Factor five item list "Self-regulation and reflection strategies"

Item		Loading score
66	Reflect on stress/anxiety from vocabulary use	0.62
71	Reflect on socio-cultural impact of word knowledge	0.57
72	Reflect on feeling from knowing words	0.518
69	Reflect on comparing TL to other known languages	0.509
67	Reflect on using VLS and their impact on learning	0.502
52	Stare at words to remember visually	0.49
74	Reflect on the sound of TL when learning words	0.463
64	Reflect on learning style/strengths/weaknesses of learning	0.433
68	Reflect on importance of word knowledge on language learning	0.423
70	Think about direction of translation for word knowledge	0.421
55	Skip difficult/unknown words	0.37

Items that were not obviously connected to the central factor theme included reflecting on errors (ITEM 65), using extrinsic motivation (ITEM 54), and the use of technology to assist in learning (ITEM 60). It is possible that participants may have perceived error correction and use of technology as continued means of finding new word knowledge, which would place those strategies more meaningfully within the central theme of the item group. However, this

remains conjecture as the wording of the VLS item statements may have been misleading or overly vague for the participant audience, resulting in misrepresentation. Misleading and vague item statements in the item pool will be addressed in the following section.

Eleven items loaded onto factor five, which explained 5.75% of the variance. The majority feature that VLS in this item group possessed was the use of reflection on and regulation of their vocabulary learning experience. These reflections were characterized by affective considerations and self-regulation (ITEM 55, 66, 72), considering the impacts of word learning (ITEM 67, 68, 71), considering personal learning style (ITEM 64), and considering the nature of the target language (ITEM 69, 70, 74).

Meta-strategies are strategies used to regulate one's learning with regards to motivation, emotions, planning, strategy choice, and how to use those strategies. These kinds of strategies have been represented in other VLS taxonomy as "self-motivation" and "overcoming anxiety" strategies by Stoffer (1995), "metacognitive strategies" by Schmitt (1997), "management strategies" in Fan (2003), and "selective attention" and "self-initiation" strategies in Gu and Johnson (1996). Gu and Johnson also included a section in their VLQ on "beliefs about vocabulary learning" that perhaps most closely resembles the reflective statements that loaded onto factor five. Nation's (2013) taxonomy includes an entire classification of strategies used for planning what vocabulary knowledge to learn, how to learn it, and when to learn it.

An item that did not obviously fit into the central item group theme was "staring at words to help remember them visually" (ITEM 52), a statement that seems to reflect a more rehearsal-based approach to word learning. However, the extent to which this statement reflects an actual *strategy* is suspect due to its perceived lack of a clear goal besides retention of a word's orthographic form, which has been covered elsewhere more explicitly (ITEM 19, factor six). Issues related to the core strategic concepts and redundancy of item statements will be covered in the following revisions section.

Table 10 Factor six item list "Lexical information strategies"

Item		Loading score
26	Organize words by word-type	0.727
20	Pay attention to how words change with grammar	0.699
21	Pay attention to en/ett word distinction	0.573
22	Pay attention to words inside compound words	0.562
27	Organize words into semantically similar groups	0.538
23	Organize words using language rules	0.537
73	Pay attention to morphology of words	0.531
19	Pay attention to orthography	0.451

The final item grouping, factor six, accounted for 5.30% of the variance with eight items loading onto it. The items in this group, while including VLS that represented association-making techniques (ITEM 23, 26, 27) as well as analytical techniques (ITEM 20, 21, 22, 73, 19), all shared the core characteristic of being concerned with the strategic use of lexical information to better understand and retain related vocabulary knowledge. The lexical information occurring in VLS items here include representations of the *form* (ITEM 22, 73, 19), *meaning* (ITEM 27) and *use* (ITEM 26, 20, 21, 23) dimensions of word knowledge.

The wording of the item statements clustered onto this factor may have had an influence on loading scores due to their nearly uniform use of "I pay attention to" or, "I organize" when describing each represented VLS. This grouping could result in misinterpretation of items as being related to learners who are simply "attentive to lexical information" when word learning, rather than actually representing methods of strategic learning. Steps to combat such issues are discussed in the revisions section.

Table 11 Cronbach alpha per factor group

Construct	Cronbach alpha	Total items
1. Memorization strategies	0.856	17
2. Depth enhancing strategies (Use)	0.795	12
3. Context- and association-based strategies	0.832	14
4. Depth enhancing strategies (Sources)	0.743	12
5. Self-regulation and reflection strategies	0.753	11
6. Lexical information strategies	0.812	8

A Cronbach's alpha measurement was obtained for each factor group in order to evaluate the internal consistency of item lists (see Table 11). Alpha coefficients between 0.743 and 0.856 for all factor groupings suggest an adequate reliability of item stability per construct (Nunnally & Bernstein, 1994), though may also have been influenced by the relatively high number of items per group.

4.2. Item deletion, retention and revision

The EFA performed using data collected by the SVLSS 1.2 was intended to guide interpretation of the underlying theoretical VLS categories represented by the items included on the instrument. The six-factor solution rotated factor pattern values, however, highlight issues with the item pool for the SVLSS in terms of possible redundancy of items and conceptual accuracy related to strategic learning. Furthermore, a careful review of the six-factor VLS model in comparison to other VLS taxonomy (LaBontee, in press) indicates a need for careful consideration of what kinds of VLS information the SVLSS stands to collect, and what kinds of VLS information it

does not. Concerns regarding readability and accessibility are also raised and addressed in order to facilitate further revisions aimed at improving the instrument.

The remainder of this paper will present adjustments made to the item pool of the SVLSS 1.2 in relation to item-construct fit, accuracy of strategic concept intended for representation, taxonomical revisions, and overall readability and accessibility.

4.2.1. EFA results as a means of examining the item pool

It should be noted at the outset that although EFA has commonly been used to help facilitate questionnaire validation and design, it remains only an interpretive tool that does not offer a concrete formula for instrument refinement (Osborne, 2014). That said, although the exploratory nature of EFA may result in misleading and non-generalizable conclusions (i.e., Petrić & Czárl, 2003), it can also be used as a tool to help to point towards potential hazards that may exist for nascent instrument designs. As such, EFA results were revisited in order to help guide attention towards potentially problematic items in the SVLSS. The purpose of this examination was to operationalize the deletion or revision of inappropriate items in the item pool by seeking out problematic patterns suggested by EFA results.

Low and diffuse scores for individual items were examined with regard to their fit within the chosen VLS construct mapped onto factor groupings. Score ratings (high, moderate, low) were applied to the rotated 6-factor pattern matrix values in order to establish thresholds used to examine issues with cross-loaded items. A survey of all scores resulted in labels of *low* if they were between 0.2-0.299, *medium* between 0.3-0.399, and *high* over 0.4, and shown in Table 12 below. Scores below 0.2 were removed for visual clarity.

Three types of cross-loading arose from an examination of scores: items that scored high on one factor but also cross-loaded onto other factors with moderate or low scores, items that cross-loaded with similarly moderate scores across several factors, and items that cross-loaded with similarly low scores across factors. These cross-loaded items were then subject to a review that considered where the diffuse loading may have originated from. Looking primarily at the VLS text statements representing each item, three patterns of issues emerged related to item-construct fit, over-specificity of VLS representation, or conversely, overly vague representation of VLS.

First, several items that returned low or cross-loaded scores seemed to all share a feature that their representative VLS did not "fit" into a single one of the six factor groups but could ostensibly represent aspects of several groups. For example, ITEM41, "I try to memorize words however I can" reflects use of memorization strategy for word learning, but the vague wording of "however I can" is worded in a way that is highly susceptible to a variety of interpretations by participants.

Similarly, ITEM59, "I plan to use my free time to casually practice Swedish vocabulary" and ITEM42, "I write down vocabulary notes" are perhaps worded in ways that are far too open to interpretation to be reliable representations of VLS groups.

Table 12 Rotated factor pattern for 6-factor solution (cross-loading scores only)

	1	2	3	4	5	6
ITEM04	0.318**		0.406***			
ITEM14	-0.078	0.503***	0.065	0.382**	0.266*	
ITEM15	-0.1	0.559***			0.334**	
ITEM21	0.227*	0.323**	-0.085	0.077	0.018	0.573***
ITEM27	0.139	-0.073	0.348**	0.026	0.094	0.538***
ITEM28	-0.152	-0.019	0.255*	0.359**	-0.024	0.085
ITEM32	0.017	0.317**	0.42***	-0.02	0.339**	0.289*
ITEM43	0.613***	0.061	-0.062	0.316**	-0.047	0.108
ITEM49	0.508***	-0.162	0.343**	-0.104	0.043	0.06
ITEM59	0.433***	0.322**	-0.095	0.251*	0.207*	0.033
ITEM60	0.15	0.077	0.168	0.32**	0.092	0.099
ITEM61	0.538***	-0.07	0.3**	0.068	0.011	0.112
ITEM64	0.273*	0.358**	0.01	0.235*	0.433***	0.005
ITEM65	0.065	0.223*	0.019	0.495***	0.381**	0.056
ITEM67	0.302**	0.159	0.12	0.132	0.502***	0.084
ITEM68	0.245*	0.195	-0.09	0.331**	0.423***	-0.071
ITEM69	-0.01	0.041	0.089	0.425***	0.509***	-0.039
ITEM73	0.147	0.192	-0.14	0.143	0.362**	0.531***
ITEM03	0.146	0.394**	0.354**	-0.162	-0.038	-0.134
ITEM05	0.165	0.374**	0.397**	0.071	-0.073	0.096
ITEM10	-0.193	0.218*	0.243	0.389**	0.09	0.084
ITEM18	0.201*	0.032	0.336**	0.296*	0.01	0.157
ITEM30	0.108	0.042	0.384**	0.006	0.372**	0.232*
ITEM33	-0.082	0.1	0.32**	0.384**	0.135	0.29*
ITEM40	-0.017	0.301**	0.242*	0.238*	0.065	0.139
ITEM42	0.451***	-0.058	-0.009	0.47***	0.024	0.045
					Multiple factor (low only) score	
ITEM41	0.269*	0.186	0.155	0.248*	0.134	0.227*

Left-side group labels: Single-factor high-score (with med and low) — ITEM04 through ITEM73; Multiple factor high/med (with low) — ITEM03 through ITEM42.

***	High
**	Medium
*	Low

Note. Scores > 0.2 filtered from table.

A second problem was observed in overly contextually-niche VLS items that may have been too specific to load onto a specific construct, instead cross-loading onto several factors, or not finding adequate representation within the factor solution extracted. For example, ITEM03, "I practice vocabulary by describing the meaning of words in Swedish without saying them," ITEM04, "I create new mnemonic phrases to help me remember Swedish words," and ITEM15, "I watch TV or film [in Swedish or with Swedish subtitles] to try and find or practice Swedish words" may

not have been strategies that are readily comprehensible or may have been misinterpreted by participants due to non-exposure to such specific practices.

The third problem was characterized by high-scoring items that seemed to fit the factor group they loaded onto (ITEM05, ITEM10, ITEM14, ITEM32, ITEM40, ITEM61), but suffered from vague or imprecise wording (e.g., ITEM05, "I *make up* my own sentences to help me remember specific words"), or represented multiple or clustered iterations of VLS in a single statement (e.g., ITEM10, "I ask others (*teachers, friends, natives*) about Swedish word knowledge"). These and the above issues with the ambiguity, overly-contextual nature, or interpretability of item-statement wording have potentially contributed to the collection of "unclean data," or responses that do not necessarily link up with the constructs thought to be represented by the instrument (Osbourne, 2014). This potential for misrepresentation likely contributed to low scoring and cross-loading issues found in the rotated component matrix. The above issues with the items listed were detected through the guidance of EFA results, but will be consulted during revisions made to the entirety of the SVLSS 1.2 item pool.

Table 13 Examples of unclear VLS representation in item statements

Item	Original text	Complication	Revised text
51	I label items (i.e., in my home, workplace) in order to review them often over time.	Multiple VLS in single item statement.	I label items (furniture, utensils, etc.) to help me remember the Swedish words for them.
19	[I] try to remember how to spell words.	Does not reflect strategic behavior.	I try to learn spelling of words letter by letter.

Adjustments to statements revised to clarify the VLS concept represented by the item (ITEM 43, 46, 48, 39, 47, 51, 1, 2, 15, 16, 6, 17, 32, 11, 9, 55, 26, 22) reconsidered the core strategic element of the intended VLS, then revised the text according to that element. For example, ITEM32, "I remember the *sentence context* for words I found in those sentences" became, "I connect words to the sentence, phrase or story I find them in" (see more examples in Table 13). As the strategy in question sought to determine if participants encode word information using associated textual context, the overly vague wording was replaced with a concrete statement exemplifying the core VLS.

Additionally, it was observed that some items loaded onto factors potentially due to the influence of similarly worded item statements. For example, items in factor six (lexical information strategies) nearly all included wording formulations using "I pay attention to" or "I organize." The item statements included in this factor group were differentiated from their original uniformity in wording choices as a means of avoiding item-factor clustering due to statement wording rather than the VLS intended to be represented by the item.

There were a significant number of statements that were problematic with regard to their underlying conceptual representativeness of strategic behavior. These complications were identified as: items that did not actually represent strategic behavior, but rather, seemed to represent reflections on individual learning beliefs or individual learning style(s); items that were overly vague and non-representative of any clear VLS group(s); and items that were redundantly representative of other VLS items already included in the item pool. Examples of complicating items are shown in Table 14 below.

Table 14 Examples of other issues with item statements

Item	Text	Complication	Construct
	NOT STRATEGIC - BELIEF		
53	My motivation for Swedish word learning comes from my natural interest in the language.	Motivational belief. Non-strategic.	2
68	I reflect on the importance of learning Swedish vocabulary in terms of my overall language learning.	Reflective practice. Non-strategic.	5
	NOT STRATEGIC – L. STYLE		
60	I use technology as a means of learning.	Modality of study. Non-strategic in itself.	4
	VAGUE		
41	I memorize words however I can.	Does not represent any specific VLS.	1
	REDUNDANT		
58	I plan to review [specific amounts of] vocabulary over specific time periods.	Reflects same core VLS as #43.	1
43	I will review words or my own notes repeatedly over time.		1

The above complications led to the deletion of 28 items from the SVLSS 1.2 instrument. Nearly the entire item group of "self-regulation and reflection strategies" was deleted as, after consideration of what strategic behavior is, these items did not, in fact, reflect planned, conscious, goal-oriented strategies. Rather, they represented reflective practices related to vocabulary learning, which are important for self-regulation of learning, but non-strategic as stated. Deleted items were classified as reflecting preferred learning styles and self-regulative, but not strategic, behavior (ITEM 60, 63, 64, 65, 66, 67, 68, 69, 71, 72), items reflecting learning beliefs and motivations (ITEM 53, 54, 56, 74), and items that were too vague to reflect any concrete VLS concept (ITEM 3, 13, 14, 18, 41, 52, 57, 62, 70, 73). Items reflecting already included VLS concepts (ITEM 40, 42, 58, 61) were also removed.

Two of these problematic items were retained and revised for use (ITEM 19, 20). For example, ITEM19, "I try to remember how to spell words" is not inherently strategic – the statement does not indicate purpose or goal-orientation, it simply asks participants to rate how salient a word's orthographic form is to them. This item was revised as, "I try to learn words spelling letter by letter" in order to reflect a strategic plan-of-action for retaining vocabulary knowledge.

4.2.2. Readability and accessibility

The original text[5] used in the SVLSS 1.2 was measured for readability using the Flesch Reading Ease (FRE) test. The FRE test uses a formula for determining readability of a text with mathematical comparisons between sentence length and total amounts of words, and between total syllable count and the total amount of words (Flesch, 1948). The FRE measurement for the SVLSS 1.2 was 65, considered to reflect a reading difficulty of "plain English" easily understood by age 13-to-15-year-old native English speakers.

Following EFA and resulting item list adjustments, item statements were scrutinized with regard to their readability for a wide audience of English-user-proficiencies. Accessibility was revised through adjusting statements to reflect simple, concise language that avoids the use of jargon wherever possible (see Table 15 for examples).

Table 15 Examples of item statement adjustments for readability

Item	Original text	Complication	Revised text
25	I make use of pictures (in text) or gestures (in speech) to help me understand Swedish vocabulary that I find in that context.	Overly complicated, unclear use of *understand*, use of difficult words.	When I see pictures nearby or related to Swedish text, I use them to help me guess the meaning of Swedish words there.
50	... use flashcards/index cards (or similar study tools) to help me review words.	Jargon Use.	I write words on one side of a card, and the meaning on the other side to help me review words.

Forty-three item statements were adjusted in order to address concerns with the wording of text. Most changes to item statements that were revised for language simplicity (ITEM 45, 44, 49, 12, 38, 37, 36, 29, 35, 34, 31, 4, 5, 24, 10, 33, 21) were minor adjustments intended to direct participants more towards the particular VLS in question. For example, ITEM29, "*I try* to connect other related Swedish (*or native language*) words to the word being learned" became "I connect other related Swedish words to the one I am learning." "Trying" is inherent in all VLS use due to their being effortful by definition, but using the word acts to weakens the statement (i.e., trying does not necessarily reflect doing), and connecting TL words to L1/additional language translations is a somewhat natural function of language learning that does not need to be included in the item statement, risking further confusion of the VLS being represented. Item statements revised for use of jargon (ITEM 50, 25, 7, 8, 28, 27) generally were overly verbose, or used inappropriately academic terminology for participants.

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[5] All item statements, demographic survey questions, introductory instructions, and open-ended questions.

For example, ITEM27, "I try to put Swedish words into groups that have similar meaning or themes to help me remember them" became "I group words into categories (e.g., animals, utensils)." Providing a simple example better explains the core VLS concept of the item than using a moderately complex text explanation.

These adjustments to item statements, in combination with deletion of items according to EFA findings and VLS taxonomy concerns, as well as addition of items from other VLS taxonomy (LaBontee, in press) resulted in an FRE score of 72.5 for the SVLSS 2.0, a marked improvement from the 65 score received the SVLSS 1.2. This score indicates a level of readability that should be easily understood by 13- to 14-year-old native speakers of English. Although the questionnaire is used by English L2 users, they are adults who use English at the university level in Sweden, suggesting that the evaluated level of readability for the SVLSS should be accessible to its target audience.

5. Discussion

The main thrusts of this study have centered on the importance of a transparent instrumentation process, as well as the development of a context-specific VLS taxonomy from the ground-up. Transparency, here, is conceived of as the act of reporting on the steps taken to create, evaluate, revise and utilize a research instrument, all while keeping in mind the intended use of said instrument. As past survey-driven research into learners' VLS use has suffered from a lack of clear reporting on instrumentation practices, the findings from that research can be somewhat difficult to interpret in connection with how they were obtained. The findings emergent from the analyses performed on the SVLSS 1.2 indicate that even with carefully planned steps regarding design, piloting and revision, discrepancies and issues can still arise during instrument development. As data sets are restricted by the scope of the instruments and practices used to collect them, first obtaining a transparent illustration of what conceptual structures underlie those instruments and practices is paramount to be able to interpret principal data sets in valid and reliable ways. Although other surveys used in research may have undergone similar development regimens, the lack of clear reporting on these processes obscures the reasons for why certain items or concepts are included (or excluded), and how certain findings are arrived at through the type of data that is actually collected.

However, SVLSS development has not gone without its own limitations. The SVLSS 1.2 item pool was generated through a data collection and analysis process that used interviews and learning tasks to elicit and observe strategy use for vocabulary learning in Swedish as a L2. Representativeness of the SVLSS 1.2 item pool should thus be considered restrained to data gathered during that

initial investigation, and to feedback collected from pilot participants who contributed to the revision of the SVLSS version 1.0 and 1.1. A benefit of this process, however, lies in the instrument being contextually situated in and by its target audience. This supports one of the main purposes of the instrument, as it is intended to represent strategic learning specific to the adult, Swedish L2 learning context (e.g., ITEM 21, "Pay attention to *en/ett* word distinction")[6]. The instrumentation process reported on here allows for a transparent understanding of how this instrument has been contextually situated, and how it has arrived at the underlying taxonomies that govern further development.

The next step in the revision and adjustment process for the SVLSS will focus on a comparison of other VLS taxonomy and how the SVLSS item list compares to them in terms of VLS representativeness. This will allow for the illustration of possible gaps (or inappropriateness of items) in the SVLSS instrument, and help situate what kind of representativeness it holds for VLS constructs as compared to other instruments. Such a comparison can better demonstrate what kinds of VLS information the SVLSS aims to (and *does not* aim to) collect from participants.

In LaBontee (in press), the six-category VLS model that emerged from interpreted EFA results here is compared to VLS taxonomy appearing in Stoffer's (1995) VOLSI, Gu and Johnson's (1996) VLQ, Schmitt's (1997) VLS questionnaire, and Nation's (2013) VLS taxonomy. This comparison results in the six-category VLS model being altered to better integrate elements from the other VLS taxonomy reviewed, centered on theoretical scaffolding from Nation's VLS taxonomy. The resulting model encompasses a four-category model that classifies VLS as: strategies for improving word knowledge (using rehearsal and encoding), productive activation strategies, strategies for establishing new word knowledge (using sources and contexts), and self-regulative strategies.

As a means of supporting this updated VLS taxonomy with regards to construct representation, the revised item pool from the SVLSS version 1.2 is adjusted further through the addition of items found in other VLS taxonomy. A visual representation of the changes made from the six-category model (SVLSS 1.2) to the four-category model (SVLSS 2.0) is provided in Table 16. For an in-depth discussion concerning the adoption of the four-category VLS taxonomy and the changes made to the SVLSS item pool related to this shift, see LaBontee's (in press) VLS list meta-analysis.

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[6] Swedish nouns are gendered into common (*en*) words and neuter (*ett*) words, commonly learned with their associated article: e.g., *en katt* (a cat), *ett äpple* (an apple).

Nation's VLS Taxonomy			SVLSS 1.0	# Items	SVLSS 2.0	# Items	Influences
Skill in use: Enriching Knowledge	Processes: Noticing, Retrieving, Generating		Memorization Strategies	15	STRATEGIES FOR IMRPOVING WORD KNOWLEDGE (Rehearsal)	9	VLQ, Nation: Rehearsal & Encoding Strategy Distinction
			(Lexical information strategies)	8	STRATEGIES FOR IMPROVING WORD KNOWLEDGE (Encoding)	24	VLQ, Nation: Rehearsal & Encoding distinction VLQ: 3 items Schmitt: 3 items VOLSI: 1 item
			(Context & Association Based strategies)	14			
			Depth Increasing Strategies (via Use)	12	PRODUCTIVE ACTIVATION	8	Nation: Generating/Skill in use VOLSI: 2 items
	Sources: Finding information about words		Depth Increasing Strategies (via Sources)	12	STRATEGIES FOR ESTABLISHING NEW WORD KNOWLEDGE (Sources)	13	Schmitt: Establishing new word knowledge distinction Schmitt: 1 item VLQ: 3 items VOLSI: 2 items
					STRATEGIES FOR ESTABLISHING NEW WORD KNOWLEDGE (Contexts)	7	VLQ: 4 items
	Planning: What to focus on and when		Self-regulation & reflection	11	STRATEGIC SELF-REGULATION	8	VOLSI: 4 items VLQ: 2 items
			TOTAL	72	TOTAL	69	

Figure 2 Side-by-side comparison of VLS taxonomy for SVLSS 1.0 and 2.0

The updated SVLSS 2.0 is being used and evaluated in a study investigating patterns and possible profiles of adult, Swedish L2 learners' VLS use related to individual differences between learner groups in LaBontee (2018).

6. Summary

This study has focused on providing a transparent report on the methods used and decision-making that has facilitated initial interpretations of a VLS questionnaire that was developed through data-driven item pool generation, and thus without *a priori* assumption of its underlying construct make-up. This method of instrumentation was chosen explicitly, as to avoid simply adapting an instrument that was created for use with another target audience than the one intended. Rather, this method was employed with the intention of creating a questionnaire that is driven by data collected from the target audience (adult, beginner Swedish L2 learners), built in a ground-up fashion, and then ready for distribution to the same population. However, as mentioned earlier, this resulted in the initial item pool being representative of only the data collected to create it, not necessarily representative of a wider range of VLS available to those learners. As a response to this, this study sought to first better understand what the item pool *did* represent, and then once thus informed, explore what else the item pool *could* represent. Understanding the

item pool representation was operationalized through EFA and scaffolded through comparisons to other VLS taxonomy.

The EFA performed on collected data from the SVLSS resulted in the proposal of a six-category VLS taxonomy used to explain the constructs represented by the SVLSS item pool. This taxonomy was interpreted and described through the use of comparisons to VLS classifications found in other VLS lists and vocabulary knowledge taxonomy. These comparisons also acted as a means of examining representativeness of items included (and not included) in the SVLSS. Alongside these comparisons, the SVLSS item pool was reviewed using EFA findings as a guide that suggested possible issues with item statement wording as related to redundancy and representation of VLS concepts. Revisions to item statements as well as inclusion (or exclusion) of items in the item pool were made on the basis of the core strategic behavior represented (or not represented) by statements in relation to the six-category VLS model interpreted from EFA results. Other revisions to the item pool were made in response to issues regarding statement clarity and readability of item statements included in the SVLSS, resulting in an overall improvement to readability measures for the next iteration of the instrument, the SVLSS 2.0.

Of course, continued development of the SVLSS will never produce a "perfect instrument." Rather, revision is performed with the intention of new iterations of the instrument that reflect an increasingly clearer construct structure represented by the items that are included on it. Also, the instrument will hopefully become more accessible to a wider range of English users that may engage with it. Further revalidation procedures for the SVLSS must be performed reiteratively with a variety of samples in order to develop the instrument further. Finally, establishing suggested practices for the SVLSS's use by researchers and instructors should also be addressed in order to extend accessibility and application of the instrument.

7. Conclusion

The findings observed in this study suggest that the item list for the SVLSS 1.2 has shown some level of representation regarding several key conceptual areas connected to different types of VLS that appear elsewhere in L2 vocabulary acquisition research. Comparing instruments created to operate in similar fields provides a measure of reliability in establishing which strategic learning behaviors exist and can be catalogued, but also provides insight into which strategies are more (or less) relevant to a specific context. This comparison occurs using other taxonomy as a lens for iterative evaluation, leading to a synthesis of concepts that establish a new taxonomy. Reporting on this connection-making is an important step in establishing a transparent instrumentation process, as it allows

the reader to see why an instrument was developed, for what purpose, and to more clearly understand what kinds of data it might actually collect.

The organization and arrangement of VLS concepts into a taxonomy is done so for the benefit of future research as well as learners who engage in the classification of learning strategies. Future VLS research in the Swedish L2 learning context will be able to draw from this and future versions of the taxonomy proffered here, hopefully expediting expansion into the area. The clarity of VLS categorizations can lead to smoother strategy instruction, improving learners' vocabulary acquisition and reflective learning processes.

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APPENDIX A

Swedish Vocabulary Learning Strategy Survey (Version 1.2)

Production Based (6 items)	ITEM1	I speak or write in Swedish as much as I can to practice vocabulary.
	ITEM2	I use vocabulary words in casual speech to help me remember them better.
	ITEM3	I practice vocabulary by describing the meaning of words in Swedish without saying the word out loud.
	ITEM4	I create new mnemonic phrases [sentence used to assist memory] to help me remember vocabulary.
	ITEM5	I make up my own sentences to help me remember specific words.
	ITEM6	I will use words over and over in similar situations to help me remember them.
Investigation Based (11 items)	ITEM7	I take note of common/important words I don't know so I can review them later.
	ITEM8	I look up word meaning or details by using some kind of dictionary.
	ITEM9	I look up Swedish words that I find in everyday life.
	ITEM10	I ask others (teachers, friends, natives) about Swedish word knowledge.
	ITEM11	I try to guess word meaning, pronunciation, or spelling based on what I already know about the word or where I find it.
	ITEM12	I try to read Swedish texts to find new vocabulary.
	ITEM13	I try to listen carefully for Swedish vocabulary information.
	ITEM14	I try to pay attention to useful or interesting Swedish language that I find in everyday life.
	ITEM15	I watch TV or film [in Swedish, or with Swedish subtitles] to try and find or practice vocabulary.
	ITEM16	I watch Swedish TV or film specifically without subtitles on to try and learn vocabulary from context.
	ITEM17	I make use of pictures (in text) or gestures (in speech) to help me understand Swedish vocabulary that I find in that context.
Lexical-Associative (13 items)		WHEN LEARNING SWEDISH VOCABULARY, I...
	ITEM18	... try to remember words by the way they sound.
	ITEM19	... try to remember how to spell words.
	ITEM20	... try to remember how words change with grammar in Swedish.
	ITEM21	... try to remember if a word is an 'ett ord' [ett word] or 'en ord' [en word].
	ITEM22	... try to remember compound words (words made up of 2 or more words) by paying attention to the different words inside them.
	ITEM23	... try to remember words by making language rules to connect them.
	ITEM24	... use cognates (similar words across languages) to help remember words.
	ITEM25	... try to use key-words (words used to help us recall other words) to help learn or remember words.
	ITEM26	... try to organize words [or groups of words] by word types to help me remember them.
	ITEM27	... try to put Swedish words into groups that have similar meanings or themes to help me remember them.
	ITEM28	... try to connect Swedish words to words I already know in my native language.
	ITEM29	... try to connect other related Swedish (or native language) words to the word being learned.
	ITEM30	... try to connect Swedish words to their opposite meaning or translation to help me remember.
Context-Associative (10 items)		WHEN LEARNING OR REMEMBERING SWEDISH VOCABULARY, I...
	ITEM31	... remember the context I find words in to help me remember them.
	ITEM32	... remember the sentence context for words I found in those sentences.
	ITEM33	... remember previous times that I saw or read a word to help me remember it better.
	ITEM34	... use interesting contexts (e.g., a story, action, emotion) to help me remember words.
	ITEM35	... connect images or pictures in my mind with words to help me remember them.
	ITEM36	... connect tone or music to words to help me remember them.
	ITEM37	... remember the location I saw certain words to help me remember them.
	ITEM38	... use time-related information to help me remember words.
	ITEM39	... mix up the order of words I am learning to help train myself learn them in a different way.
	ITEM40	... will remember words through common expressions or idioms that they are found in.

	WHEN LEARNING OR REMEMBERING SWEDISH VOCABULARY, I...
Memory Based (12 items)	ITEM41 ... memorize words however I can.
	ITEM42 ... write down vocabulary notes (when I study alone, in class, etc.).
	ITEM43 ... will review words or my own notes repeatedly over time.
	ITEM44 ... read words out loud [or quietly to myself] over and over.
	ITEM45 ... write individual words down over and over.
	ITEM46 ... write down lists of grouped words over and over.
	ITEM47 ... listen to recordings of vocabulary words I want to remember over and over.
	ITEM48 ... use lists of words that I write down to give myself quizzes.
	ITEM49 ... review words in study groups or with others.
	ITEM50 ... use flashcards/index cards (or similar study tools) to help me review words.
	ITEM51 ... label items (i.e., in my home, workplace) in order to review them often over time.
	ITEM52 ... stare at words to help me remember them visually.
Motivation and Planning of Learning (10 items)	ITEM53 My motivation for Swedish word learning comes from my natural interest in the language.
	ITEM54 My motivation for Swedish word learning comes from other reasons than my interest in the language.
	ITEM55 I skip difficult/unknown words that I come across in order to read/listen for overall meaning.
	ITEM56 I am willing to use Swedish vocabulary even if I might make mistakes or it makes me feel uncomfortable.
	ITEM57 I plan my own learning before, during, or after I study.
	ITEM58 I plan to review [specific amounts of] vocabulary over specific time periods.
	ITEM59 I plan to use my free time to casually practice Swedish vocabulary.
	ITEM60 I use technology as a means of learning.
	ITEM61 I put words into different kinds of groups or lists so I can keep myself organized while I learn.
	ITEM62 I pay attention to Swedish vocabulary that is especially difficult for me to remember.
Awareness of Learning Situation (12 items)	ITEM63 I reflect on vocabulary learning in Swedish in general.
	ITEM64 I reflect on my personal learning style, strengths, and/or weaknesses when studying Swedish vocabulary.
	ITEM65 I reflect on errors I make and my accuracy when using my Swedish vocabulary.
	ITEM66 I reflect on my stress and anxiety from using Swedish vocabulary.
	ITEM67 I reflect on how using different vocabulary learning strategies affects my learning of Swedish vocabulary.
	ITEM68 I reflect on the importance of learning Swedish vocabulary in terms of my overall language learning.
	ITEM69 I reflect on comparing Swedish to other languages I know or speak when learning Swedish vocabulary.
	ITEM70 I think about my direction of translation when studying Swedish words.
	ITEM71 I reflect on the socio-cultural impact of my learning Swedish vocabulary.
	ITEM72 I reflect on the feeling I get from Swedish words that I find.
	ITEM73 I notice grammar associated with how Swedish words change in different situations to help me learn them better.
	ITEM74 I reflect on the nature of the sound of Swedish language when learning and recalling words.

APPENDIX B

Initial total variance explained for SVLSS 1.2

Factor	Total	% of Variance	Cumulative %
1	12.655	17.102	17.102
2	4.804	6.492	23.593
3	3.381	4.57	28.163
4	2.596	3.508	31.671
5	2.576	3.481	35.152
6	2.462	3.327	38.479
7	1.984	2.681	41.16
8	1.883	2.545	43.705
9	1.816	2.454	46.16
10	1.669	2.255	48.415
11	1.568	2.119	50.534
12	1.518	2.051	52.586
13	1.483	2.004	54.59
14	1.447	1.956	56.545
15	1.411	1.906	58.452
16	1.298	1.754	60.205
17	1.27	1.716	61.922
18	1.233	1.666	63.588
19	1.188	1.605	65.193
20	1.118	1.511	66.704
21	1.069	1.444	68.148
22	1.004	1.356	69.504

Note. Factors 23-74, below Eigenvalue 1 suppressed.

APPENDIX C

Rotated factor pattern for 6-factor solution

Factor	1	2	3	4	5	6
ITEM1		0.635				
ITEM2		0.622				
ITEM3		0.394	0.354			
ITEM4	0.318		0.406			
ITEM5		0.374	0.397			
ITEM6		0.479				
ITEM7	0.355			0.566		
ITEM8				0.563		
ITEM9				0.481		
ITEM10				0.389		
ITEM11				0.485		
ITEM12		0.491				
ITEM13		0.643				
ITEM14		0.503		0.382		
ITEM15		0.559			0.334	
ITEM16		0.533				
ITEM17			0.445			
ITEM18			0.336			
ITEM19						0.451
ITEM20						0.699
ITEM21		0.323				0.573
ITEM22						0.562
ITEM23						0.537
ITEM24				0.425		
ITEM25			0.589			
ITEM26						0.727
ITEM27			0.348			0.538
ITEM28				0.359		
ITEM29			0.514			
ITEM30			0.384		0.372	
ITEM31			0.45			
ITEM32		0.317	0.42		0.339	
ITEM33			0.32	0.384		
ITEM34			0.493			
ITEM35			0.506			
ITEM36			0.526			
ITEM37			0.544			
ITEM38			0.673			
ITEM39	0.463					
ITEM40		0.301				
ITEM41						
ITEM42	0.451			0.47		
ITEM43	0.613			0.316		
ITEM44	0.514					
ITEM45	0.678					

Item	1	2	3	4	5	6
ITEM46	0.597					
ITEM47	0.456					
ITEM48	0.579					
ITEM49	0.508		0.343			
ITEM50	0.502					
ITEM51	0.456					
ITEM52					0.49	
ITEM53		0.342				
ITEM54				0.478		
ITEM55					0.37	
ITEM56		0.49				
ITEM57	0.486					
ITEM58	0.574					
ITEM59	0.433	0.322				
ITEM60				0.32		
ITEM61	0.538					
ITEM62	0.429					
ITEM63	0.53					
ITEM64		0.358			0.433	
ITEM65				0.495	0.381	
ITEM66					0.62	
ITEM67	0.302				0.502	
ITEM68				0.331	0.423	
ITEM69				0.425	0.509	
ITEM70					0.421	
ITEM71					0.57	
ITEM72					0.518	
ITEM73					0.362	0.531
ITEM74					0.463	