

Title: A Systematic Review of Language Learner Strategy Research in the Face of Self-Regulation

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Abstract

Language learner strategy research has been dogged by criticisms in recent decades culminating in calls for the field to be replaced with the construct of self-regulation. This paper aims to evaluate how the field has responded to such critique, and to investigate how self-regulation has impacted strategy research in recent years. The study utilizes a systematic review methodology to examine key studies conducted and published from 2010 to 2016 to reveal current trends, and to elucidate best research practices. After initially searching more than 1,000 research papers, 46 of the most field-aware studies were selected for data extraction, of which 24 were included in a final systematic map for analysis. Results show strategy research is highly reliant on quantitative measures of data collection, but also reveal a number of context-situated qualitative methods which have produced valuable results. An in-depth review of the 15 most relevant studies revealed a number of innovations that have considerably advanced language learning strategy research in recent years. In a field awash with studies that are anchored to past methodologies, this paper showcases state-of-the-art work in the field, with an aim to inform future research.

Keywords

Language learner strategies; self-regulation; applied linguistics; second language acquisition; second language learning; review; state-of-the-art

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1. Introduction

Interest into strategies used for language learning has a long history, although many scholars (e.g. Griffiths, 2015) mark the beginning of SLA-oriented research with Rubin's (1975) seminal work on the good language learner. By the early 1980s the first taxonomy of strategies emerged which encompassed learners' thoughts, actions, and social behaviors (Rubin, 1981). Although this taxonomy has been described as a list rather than a framework (Dörnyei, 2005), it was nevertheless one of the first attempts to organize strategies. This early work was followed by O'Malley et al.'s (1985) taxonomy of strategies, which borrowed heavily from cognitive theory, and focused predominantly on the cognitive and metacognitive strategies learners used to process novel information about a new language. By the late 1980s, however, these alignments with cognitive research were overshadowed by the work of Rebecca Oxford, and her development of the multi-faceted Strategy Inventory of Language Learning (SILL) (Oxford, 1990)—an easy-to-use inventory of strategies that could be used by teachers and researchers to examine learners' use of strategies. Oxford's work saw the beginning of a boom in strategy research.

At the time, a number of researchers (e.g. Hadwin & Winne, 1996; Skehan, 1989) voiced some concerns over the direction strategy research had taken—much research assumed the methods of measurement were sound, even though the statistical work of confirming the underlying structure of strategies had not been fully carried out. This caused some researchers to question the validity and rigor of some strategy research of this era. An unfortunate casualty of this era was that much robust language learning strategy research was lost in a sea awash with less rigorous practitioner-based studies. By the mid-2000s the field had reached a watershed moment. Insiders in the field such as Macaro (2006) pointed to a

number of unresolved issues in language learner strategy conceptualizations, despite 30 years of research. Skehan, who had been hesitant about the direction of the field as early as the late 1980s (e.g. Skehan, 1989), started to re-voice his concerns in the early 2000s (Dörnyei and Skehan, 2003). By 2005, Dörnyei (2005) ramped up criticism, and suggested that the whole field be replaced with the notion of self-regulation—a concept he and his colleagues later illustrated in an oft-cited study of self-regulated vocabulary learning (Tseng et al., 2006).

Dörnyei (2005, p. 191) defines self-regulation as the following:

Self-regulation refers to the degree to which individuals are active participants in their own learning; it is a more dynamic concept than learning strategy, highlighting the learners' own "strategic efforts to manage their own achievement through specific beliefs and processes" (Zimmerman & Risemberg, 1997, p. 105). The notion of self-regulation of academic learning is a multidimensional construct, including cognitive, metacognitive, motivational, behavioral, and environmental processes that learners can apply to enhance academic achievement.

On the one hand, self-regulation has a long tradition in psychology in general, extending to educational psychology, thus there is merit in claims that it offers a somewhat stable perspective within which to explore strategic behavior. On the other hand, self-regulation is an 'outsider' construct which was not theoretically developed to specifically explore second language acquisition. Thus, some see it as poor substitute for learner strategy research, which emerged as a home-grown applied linguistics construct to explore the nuanced peculiarities of language learning.

Since this time, the field of language learner strategies has been in a state of flux. Some strategy research has embraced self-regulation (Mizumoto and Takeuchi, 2012; Mizumoto,

2012; Ranalli, 2012), whereas other research has argued that self-regulation, while a valid construct, is perhaps better viewed as an addition (Gao 2007; Grenfell and Macaro, 2007; Gu, 2012). Weinstein, Acee and Jung, (2011, p. 47) support this complementary relationship in describing self-regulation as “both the glue and the engine that helps student manage their strategic learning”. As such, some researchers have integrated notions of self-regulation into existing paradigms of strategies (Oxford, 2011). Others have carried on with the status quo (Grenfell & Harris, 2017).

Against this historical backdrop, the purpose of this paper is to investigate the current state of language learner strategy research. Rather than enter into ‘replacement debates’, which have been covered in prior articles (e.g. Tseng et al., 2006; Gao, 2007; Rose, 2012), this paper aims to probe how the field of strategy research has responded to the introduction of self-regulation as an alternative paradigm of investigation. In exploring this topic, we hope to gain a richer understanding of whether, and how, the field has changed in the 12 years since Dörnyei’s (2005) landmark critique.

2. Understanding the criticisms

Language learner strategies have been defined as the “[t]houghts and actions, consciously chosen and operationalized by language learners, to assist them in carrying out a multiplicity of tasks from the very outset of learning to the most advanced levels of target language performance” (Cohen, 2011, p. 7). A more recent definition proffered by Griffiths (2015, p. 426) is “actions chosen by learners (either deliberately or automatically) for the purposes of learning or regulating the learning of language”. While these appear to be rather innocuous definitions, there has been extensive debate over what these actions are, and how researchers

can measure them effectively. To understand the current state-of-the-art in language learner strategy research, we must first comprehend the criticism the field has had to contend with.

A major problem with learner strategies has been definitional fuzziness. Macaro (2006, p. 325), during the watershed moment of strategy research, summarizes conceptualization issues as points of contention between researchers about whether strategies: manifest inside or outside a learner's mind; consist of knowledge, intention, action, or all three; should be organized into frameworks, hierarchies, or clusters; are used across all learning situations, tasks, and contexts; are integral or additive to language processing. Macaro's intention in his critique was not to condemn previous research (in fact he is a staunch defender of strategy research), but to highlight conceptual problems that had evaded researchers over thirty years of research.

Perhaps then, there was truth in Dörnyei and Skehan's (2003) early critique that language learner strategies remained "rather inconsistent and elusive" (p. 608), and that the term had "been used in far too broad a sense, including a number of different things that do not necessarily belong together" (p. 610). Indeed, as early as the 1990s, Ellis (1994) had described definitions of learner strategies as "ad hoc and atheoretical" (p. 533), which had caused the field to fail to incorporate them into a model of psycholinguistic processing (Ellis 1997). Tseng et al. (2006) note that while there is a strong sense that the strategies learners use to study language are important, there remains no coherent agreement on the defining criteria for them. This paradox underpins Dörnyei's (2005) assertion that while the construct of language learner strategies was clearly useful for researchers, it was not effective for conducting in-depth analyses in terms of what they were, and how they could be measured.

A further issue raised in critiques centers on how strategies are best measured. The lion's share of strategy research in the past involved the use of questionnaires, which were usually built upon a list of known strategies from previous research. Much of Dörnyei's original critique of strategy research centered on what he labelled as a psychometrically unjustified use of the SILL, where items are collapsed to compute mean scores according to the six categories (or factors) aligned with Oxford's taxonomy of learner strategies. However, little empirical research had been done to confirm that these factors are statistically viable (although some work eventually came later such as Hsiao & Oxford, 2002, and Yamamori et al., 2003). However, Grenfell and Macaro (2007) argue that there are other instruments of strategy research, for which claims of a lack of robustness are not warranted. In fact, Dörnyei and Ryan (2015) praised the work of Pintrich et al. (1993) in their development of the Motivated Strategies for Learning Questionnaire (MSLQ), which they argue to be a more valid instrument. Work by Vandergrift et al. (2006) in the construction of the Metacognitive Awareness Listening Questionnaire (MALQ) is also considered to have good internal validity (White et al., 2007, p. 96), as does the Survey of Reading Strategies (Mokharti & Sheorey, 2002).

Research approaches utilized by language learner strategy research form the basis of a third hub of critique. The use of questionnaires as a sole instrument in strategy research has long been labelled as problematic, with numerous calls for more situated, qualitative approaches (e.g. Tseng et al., 2006; Woodrow, 2005). It seems there is consensus among most researchers that quantitative approaches need to be built upon richer qualitative data in order to fully understand the complexities of strategy use in context, but it is uncertain as to whether an uptake of qualitative research has occurred. Additionally, Tseng et al. (2006) and Author (2015) point to the potential of methods such as stimulated recall or eye-tracking to

offer more insider perspectives into the processes of strategy use, to counter the issues surrounding self-report measures.

2.2 Research Questions

Taking stock of the criticisms and current directions in strategy research, the field is left with a number of questions, which this paper aims to explore:

1. How have researchers been conducting language learner strategy research in the face of calls for self-regulation?
 - a. How have language learner strategies been theorized in terms of the models/taxonomies used?
2. What research approaches, methodologies and instruments are currently being used in language learner strategy research?

3. Methodology: a semi-systematic review

It can be seen that researchers use a variety of terms to refer to review works, such as *review*, *literature review*, *meta-analysis*, and *systematic review*, among others. Petticrew and Roberts (2006, p. 17) suggest that authors may conduct systematic reviews and yet refer to them by another term, such as *review*. It can also be seen that still other authors may refer to their work as a *systematic review* even though the work does not meet the stringent criteria of a formal systematic review. This could cause “the full potential of these review types [to] be lost amongst a confusion of indistinct and misapplied terms” (Grant & Booth, 2009, p. 91). To avoid such confusion in the current study, a systematic review is considered one which “adheres closely to a set of scientific methods that explicitly aim to limit systematic error

(bias), mainly by attempting to identify, appraise and synthesize all relevant studies” (Petticrew & Roberts, 2006, p. 9). A positive result of following these stringent criteria is the limitation of bias, thereby increasing the trustworthiness, and arguably the *value*, of the results and recommendations of the study. Macaro et al. (2017) argue that for a review to be classified as *systematic*, the study must:

1. be carried out by more than one reviewer;
2. have transparent procedures;
3. include studies based on exhaustive and reliable searching, including doctoral theses;
4. aim to reduce reviewer bias as much as possible;
5. attempt to produce syntheses including discussions of the reliability of the evidence reviewed

Our review fulfils each of these criteria except the third point, as time resources meant that we were unable to cover all databases of research, so we only included certain journal indexes, and did not include doctoral dissertations in our review. Macaro et al. (2017) argue that the inclusion of doctoral work in reviews is essential because journals tend to not publish certain types of research findings, such as those that report a null result, which are important in understanding a body of work. As the questions guiding our review were methodological and conceptual in nature, rather than centering on the findings of the research, we felt that limiting the review to peer-reviewed research in indexed journals was justified. Following trends in other fields, such as medicine and ecology, where a review might be conducted systematically even though it does not apply some of the strict criteria needed to be classified as a formal systematic review, the methodology of the current study might be best termed a semi-systematic review. Our systematic review was conducted according to the following phases: conducting a thorough search for research articles; selecting relevant studies via

criteria to create a long list; appraising the quality of work to produce a short list; extracting information via an extraction grid; synthesising research via a systematic map (table) of the extracted information; conducting an in-depth review of the most relevant studies.

In initial scans of research within major databases for language learner strategies, we were surprised by the sheer quantity of research still being produced in what we have described above as a field in flux. Each database yielded hundreds of articles within the last ten years, yielding a pool of more than 1000 articles, which were too many for our team to manage.

However, on further inspection of the articles, it appeared the vast majority of studies had not moved beyond the type of research conducted in the 1990s, ignoring recent academic debates in the field surrounding self-regulation. Such research was clearly not relevant to our research questions, thus inclusion criteria were established to narrow the sample.

3.1 Narrowing the sample

As our research questions aimed to explore the state of strategy research in the face of self-regulation, it was essential that the research we included in the review was aware of the construct. Thus, we established inclusion criteria that articles must:

1. contain empirical research;
2. be published in an academic journal;
3. be connected to language learning;
4. have been published between 2010-2016
5. be aware of learner strategies and self-regulated learning theory, mentioning both constructs in the article's review of literature or discussion

We chose to only look at articles published after 2010, as we note that a number of highly influential publications emerged soon after the 2005-6 critiques (Doryei, 2005; Tseng et al, 2006), including response articles and chapters (e.g. Gao, 2006; Grenfell & Macaro, 2007), follow-up studies (e.g. Tseng & Schmitt, 2008), and books exploring new directions for LLS research within learner autonomy and learner agency (e.g. Hurd and Lewis, 2008; Gao, 2010). By looking after 2010, this allowed time for the theoretical ‘dust-to-settle’ to explore what researchers did in the wake of this renewed debate.

To gather articles we examined the following databases: Scopus, ERIC, Linguistics and Language Behavior Abstracts, Web of Science (Core Collection), and MLA International Bibliography and PsychINFO. We did not examine reports, dissertation research, or non-academic sources. In the search parameters, we sought articles that contained [‘language learner strategies’ OR ‘language learning strategies’] in the title or abstracts AND [‘self-regulation’ or ‘self-regulated learning’] in the body of the article, for the years 2010-2016. This produced a more manageable body of work, flagging published articles on language learner strategies that acknowledged the construct of self-regulation. However, the long list of articles was still far too large for an in-depth review. Thus, we then scanned each of the articles to evaluate its relevance according to our inclusion criteria to produce a shortlist of 46 articles. Each potentially suitable article was placed in a shared folder for further analysis.

All 46 articles were then reviewed using an extraction grid in order to more closely examine their potential contribution to our research questions. In this process, a further 22 articles were excluded, due to evaluations that they had not met the criteria. For example, some articles (e.g. Alnufaie & Grenfell, 2012; Author, 2013) were excluded as they mentioned self-regulation in passing, rather than being discussed as a construct of the research. Other articles

(e.g. Cohen & Griffiths, 2015) were excluded as they did not center on empirical research, but were a summary of expert opinions in field. Other articles were excluded due to quality of research design (e.g. Ma & Oxford, 2014).

A total of 24 articles remained (see appendix 1). Data were extracted via an extraction grid, and placed within a systematic map for analysis. Nine were evaluated in a second round of review to be of lower relevance to our research questions, showed methodological weaknesses, or were not full research articles. While these studies were included in the systematic map, they were not included in our in-depth review.

3.4 Limitations

Our review of language learner strategies has certain methodological limitations. First, the selection of our databases was based on a convenience sample in terms of those which were available, and with which the researchers were familiar. For this reason, we acknowledge there may be important articles that were missed. Furthermore, our decision to limit the review to journal articles may mean we also missed important doctoral research, which could potentially showcase new ideas and methods of research. The focus on research articles also meant that some important theoretically-based articles may also have been missed. It is also acknowledged that this review may contain potential *file-drawer bias*. Finally, our search parameters were somewhat narrow, meaning that we may have missed articles that examine similar constructs to strategies and self-regulation, but had not used the exact wording of these constructs as used in our search parameters. For this reason we do not claim that our review is comprehensive due to methods in our collection of articles that could have been more thorough and systematic. We do however feel that our review, in its focus on high-

impact research being conducted in the field, is in a good position to answer our research questions.

4. Results of systematic map

A review of methods and data collection instruments

Of the 24 short-listed articles, the majority (n=18) used predominantly quantitative data collection methodologies in their exploration of strategic learning behaviour. Eleven of the studies (a little under half) were exclusively quantitative, with no triangulation with qualitative methodologies. Luo and Weil (2014), for example, used the SILL (v7.0) and a background questionnaire to collect data from 65 international ESL students in the United States, and then conducted analyses (ANOVA and MANOVA) to examine differences in frequency of strategy use against variables such as gender, nationality and proficiency level. As a further example, Ardasheva (2016) used a proficiency test, an academic achievement measure, a validated strategy measure, a motivation scale and a background questionnaire to explore correlations between proficiency, language learner strategy use, and academic achievement.

Seven studies, although predominantly quantitative in design, incorporated qualitative methodologies, thus embodied a mixed-methods approach. Rochecoust *et al.* (2012) used a questionnaire and interview pairing to explore the relationship between the learner strategies and academic performance of 466 international ESL university students in Australia. Correlational analyses were conducted on the questionnaires and qualitative content analysis on the interview data. Other studies used mixed methods where a sole instrument seemed

inappropriate to the research context, such as Hitt and Veliz (2015) who used the SILL with 31 pre-service English teachers, in addition to semi-structured interviews and a think-aloud with just two case studies. A similar methodological approach was carried out to good effect by Grenfell and Harris (2015) who used a questionnaire, interviews and a think aloud with 120 modern foreign languages students in the UK to measure whether strategy instruction had an effect on listening and reading scores, which were measured via a test. Gunning and Oxford (2014) used a large mix of measures including three questionnaires (SILL, a background questionnaire and a task-based strategy questionnaire), an oral interaction test, video recordings and field notes to explore the effects of strategy instruction and use on success in oral interaction tasks among sixth grader French L1 speakers in an English class in Canada.

Six studies used an exclusively qualitative approach. One example of a qualitative design was Lam's (2015) study of four Hong Kongese EFL learners, which used stimulated recall, interviews, learner histories and text analysis to examine how explicit strategy instruction shapes student use of metacognitive knowledge and in what ways this knowledge promotes self-regulation in the learning of writing.

The studies included in the systematic map indicated a strong preference towards quantitative approaches to learner strategy research. Questionnaires remained the most prevalent form of data collection, with the most widely used instrument being the SILL (Oxford, 1990) which was used in 11 studies, in contrast to the MSLQ (Pintrich et al., 1993) used in four studies, and the SRCvoc (Tseng et al., 2006), used in three studies. The qualitative studies showed a range of qualitative data collection methods ranging from interviews, written learner histories, learner diaries, and field notes. However, many of the studies did not report on these data in a

systematic way. A small number of studies utilized introspective techniques such as stimulated recall (n=2) and think-aloud protocols (n=4).

A review of theoretical positioning of strategy research

The studies included in the systematic map showed a strong tendency towards a theoretical framework that was informed by Oxford's (1990) earlier work on language learner strategies. Other studies framed their work within a similar theoretical approach to Oxford's inventory while drawing on other related work in the field. Comparatively fewer studies (n=3) made mention of Oxford's (2011) more recent strategic self-regulation model. Theories of self-regulation largely drew on the work of Tseng et al. (2006), a paper cited in most of the studies. The self-regulation studies frequently mentioned Zimmerman (1990), and to a lesser extent Pintrich (2000) and Winne and Perry (2000), as informing their theoretical frameworks of investigation.

5. Results of in-depth review

To provide a closer examination of research, 15 of the most relevant articles in our systematic map were included for in-depth review. The in-depth review revealed differences in learner strategy research in terms of their conceptualizations of strategic learning, which could be categorised into three broad types of research:

1. strategy research that embraced self-regulation theory as central to the research framework
2. strategy research that utilized traditional language learner strategy constructs, while acknowledging contributions from self-regulation

3. strategy research that moved the field into novel territory, via means of developing new instruments, exploring new structures, or examining relationships between strategic learning other theories.

The in-depth review required a close analysis of each research article by at least two members of the research group, as well as the principle investigator. It required the construction of an in-depth written critique of each article for possible inclusion in this paper. A selection of these reviews is presented here in abridged format according to the three emergent research types. We have elected to illustrate each type of research with two of the most relevant articles from our in-depth review.

5.1 Self-regulation-oriented strategy research

Huang (2011), Author & Co-author (2013), Lam (2015), and Zeigler (2015) were four studies in our in-depth review that explored strategic learning primarily via a self-regulation construct. We use Author & Co-author (2013), and Zeigler (2015) to illustrate two different applications of this construct, as they showcase opportunities for future in-depth qualitative and large-scale quantitative research respectively.

Author and Co-author's (2013) longitudinal study utilised Dörnyei's (2005) framework of self-regulation to explore *[removed for blind review due to self-identifying study]*. The data were coded according to Dörnyei's taxonomy and to additional emergent codes. The findings indicated that managing commitments and controlling emotion, boredom and procrastination were difficult facets of self-regulation for a preponderance of the learners. The authors posit *[removed for blind review due to self-identifying study]*, but nevertheless the theory was useful in revealing inherent strategic difficulties for students' learning which may not have

been identified via a traditional language learner strategy framework. The authors suggest a causal network where various elements of control can break down if ineffectively regulated by learners. This study serves as an illustration of how self-regulation can be investigated via in-depth qualitative methods to reveal nuanced interplay between each of Dörnyei's (2005) motivational control system.

Ziegler (2015) attempted to situate constructs of the self-regulated capacity for vocabulary learning (SRCvoc) within a broader context of self-regulated learning by examining the convergent validity of the SRCvoc construct. Simple linear regression analysis was conducted to explore relationships between constructs measured by SRCvoc and the motivational characteristics of self-regulated learners as measured by MSLQ. Both questionnaires were administered in participants' L1 to a large sample of pupils ($n=572$) in grades 4-9 enrolled in EFL classes in Saxony, Germany. Being regressed on each of MSLQ variables individually, SRCvoc was found to significantly predict each of the MSLQ characteristics: academic self-efficacy ($F = 68.75, p < .05, r = .33, R^2 = .11$), control beliefs ($F = 5.66, p < .001, r = .01, R^2 = .01$), intrinsic goal orientation ($F = 99.95, p < .001, r = .39, R^2 = .15$), extrinsic goal orientation ($F = 36.15, p < .001, r = .24, R^2 = .06$), and task value ($F = 105.98, p < .001, r = .40, R^2 = .16$). Despite finding a small effect size for test anxiety, control beliefs and extrinsic goal orientation, the study makes a significant contribution to the advancement of self-regulation and language learner strategy research by persuasively showing SRCvoc as a valid measure for the behaviors displayed at the performance stage of the self-regulation cycle. The work also shows an important link between newer self-regulation constructs and older learner strategy constructs, providing much needed empirical evidence to support previous claims (e.g. Gao, 2007) that the constructs are complementary.

5.2 Language learner strategy-oriented research

Seven of the 15 studies in our in-depth review could be categorized as continuing the tradition of language learner strategy research (Ardasheva & Tretter, 2013; Cáceres-Lorenzo, 2015; Gunning & Oxford, 2014; Kirsch, 2012; Luo & Weil, 2014; Rochecouste, et al., 2012; Véliz, 2012), as judged by their use of known language learner strategy instruments and/or their adoption of known taxonomies in their theoretical framework. We have selected two starkly different studies that highlighted important work in this tradition: Ardasheva and Tretter's (2013) study because of its striking contribution to theory development for researchers in the field; and Veliz's (2012) understated case study, which has direct relevance to teachers seeking to apply language-learner-strategy concepts to language-related problems in their classrooms.

Ardasheva and Tretter (2013) aimed to validate a modified version of Oxford's (1990) SILL for school-aged ESL learners in light of criticisms that is not a psychometrically-valid measure. The authors modified the SILL for younger English language learners, and made changes to the items to address categorical issues, and created a shorter instrument called the *SILL-ELL Student Form*. After developing and piloting the modified version, it was distributed to 1,057 students in 38 urban, American Midwestern elementary, middle and high schools, where more than 40 different first languages were represented. Confirmatory factor analysis indicated that the modified SILL-ELL Student Form, with its six factors, was a good fit for both the validated and combined samples ($GFI = .95$, $CFI = .95$, $RMSEA = .03$, $SRMR = .04$). The study is significant because it illustrates that instruments based on the SILL can provide psychometrically-sound measures of language learner strategies. We believe that the 28-item *SILL-ELL Student Form* is a breakthrough instrument for measuring the language

learner strategies of school-aged ESL learners. However, the study's importance also lies in its provision of a methodological roadmap for how the SILL, which is questionably used in hundreds of studies today, can be adapted and validated to produce a more robust measure for other language learning contexts.

Véliz's (2012) exploratory case study investigated whether and how motivation and strategy use influenced the development of two EFL learners' pronunciation and accent attainment. Both participants were pre-service English teachers in their third year of university, described by the researcher as exhibiting exceptionally good English pronunciation. Data gathered from semi-structured interviews were analysed and coded according to the Oxford's taxonomy, while acknowledging some of the criticisms lobbied against it. For Véliz, however, language learner strategies remained a useful lens to explore his highly-contextualized study. Findings revealed metacognitive strategies were of most importance to both participants, and could explain their success in pronunciation attainment. In light of Véliz's discussion of self-regulation, wherein metacognitive strategy use is understood as referring to the same construct (described by Véliz as the underlying ability to control one's learning, and not related to specific tasks), the conclusion can be drawn that the most influential factor to both participants was their self-regulation, or their indirect strategies. Each participant was also found to be highly motivated, which contributed considerably to their linguistic success. However, Véliz does not include any discussion as to whether metacognitive strategy use may be dependent on this highly motivated condition. That is, whether metacognitive strategy success depends on a pre-condition of being highly motivated. Nevertheless, despite the study's self-observed limitations of its small sample size and confined language learning activity, we believe Véliz's study to be an adequate model of in-context, qualitative language learner strategy research being conducted with sensitivity to current issues. Although, it could

have been improved with a more longitudinal design instead of its single shot of data collection. Nevertheless, in a field where strategy research is being attacked for their large-scale instruments and generalized conclusions, this study shows that strategies still have relevance for teachers when exploring the nuanced and intricate learning practices of their learners.

5.3 Research that reveals new avenues for self-regulated learner strategies

Finally, we present research articles that are moving the field into novel territory, via means such as developing new instruments, exploring new structures, or examining relationships between strategic learning other theory (Anam & Stracke, 2016; Ardasheva, 2016; Park et al., 2014; Teng & Zhang, 2016). Of these four articles in our in-depth review, we showcase Ardasheva (2016) and Teng and Zhang (2016) as having the greatest implications for driving forward the field of strategic learning.

Ardasheva (2016) used Structural Equation Modeling (SEM) to explore relationships between language learner strategies and reading/math achievement, as well as mediating factors (motivation, age, first language proficiency, and English language proficiency) and intervening factors (age and length of residence). It explored these factors against strategy use and scholastic achievement among elementary and middle school ESL learners (N=805) in the USA. This study used the *SILL-ELL Student Form* (discussed above) to collect data on language learner strategies and then to explore the relationships between these and the other constructs. The study revealed that six tested models accounted for a large percentage (54%) of the variance in academic achievement, indicating that students' individual differences can have a profound effect on scholastic outcomes. When examining the effect of strategies in

particular, only metacognitive strategies were observed to have a significant direct effect on academic achievement, with English proficiency further enhancing this positive effect. This suggested that students with higher metacognitive strategy use, coupled with higher proficiency, were more successful academically. The study found metacognitive strategy use to be stable across the intervening variables, but cognitive strategies to decline with age and length of residence. Ardasheva's (2016) contribution to the field is significant, as it adds evidence to a long-assumed relationship between language learner strategies and not only language learning proficiency, but also success in other realms of education to which the language is applied.

Teng and Zhang's (2016) study is a successful attempt to create and validate a new instrument – the Writing Strategies for Self-Regulated Learning Questionnaire (WSSRLQ) – and to describe the multifaceted structure of self-regulated writing strategies. The study also aimed to examine the effect learners' reported use of the strategies had on their writing performance. A writing test (IELTS, Task 2) as well as a 7-item Likert-scale questionnaire (developed by the authors through item generation, initial piloting, and psychometric evaluation) was administered to L1 Chinese L2 English undergraduate student volunteers (n=790) from six universities in northeast China. The 40 items in the questionnaire used a 7-point scale typical in psychometric tests, ranging from 1 (not at all true of me) to 7 (very true of me) to probe into the trait features of self-regulation. This scale avoided the problems of using a frequency-based Likert scale, as per other strategy instruments like the SILL, which causes complications for statistical analysis. Three models of self-regulated writing strategies were hypothesized in the study and tested via confirmatory factor analyses through structural equation modelling. A nine-factor model was revealed as the best fit (GFI = .93; TLI = .92; CFI = .93; RMSEA = .044 [.039, .048], SRMR = .054), with the 40 questionnaire items being

distributed among nine correlated factors. A hierarchical structure was evident, with self-regulation positioned as a higher order construct, which accounted for correlations with the nine lower-order writing strategies. The strategies were theoretically related to four main self-regulated learning constructs (cognitive, metacognitive, social-behavioral, and motivational regulation). The nine writing strategies (as indicated by a strong effect size: $R^2 = .37$) predicted participants' writing performance and accounted for 37% of the variance in the results of students' writing test ($F(9,745) = 45.251, p < .001$). Simultaneous multiple regression indicated six of the nine strategies were significant individual predictors of students' writing performance. The study showed that it is possible to successfully apply the constructs of self-regulation theory, adopted from educational psychology, to the field of EFL/ESL writing while maintaining a focus of strategies as products of such behaviour. While some critics might view the terminology used in this article as a re-branding exercise (in its classification of a strategy inventory as a self-regulation constructs), the study nevertheless has a robustness to its instrument development that melds learning strategy research traditions with methodological concepts informed by self-regulation. In addition to this contribution, the study adds much-needed evidence to support the widely-debated relationship between strategy use and language learning success.

6. Discussion and conclusion: Where are we now?

Current directions for theory in language learner strategy research indicate three main routes for future research: (1) abandon language learner strategy research in favor of self-regulation; (2) acknowledge self-regulation within existing conceptualizations of language learner strategies; and (3) re-conceptualize language learner strategy research. Of course, there is a fourth option of continuing language learner strategy research vis-à-vis the methods of the

1990s, but this would mean turning a blind eye to recent critiques—a direction not supported in this review.

6.1 Current directions of research

Regarding the first direction, this concept was originally championed by Dörnyei (2005) who made the argument that self-regulation was more extendable “into a grand theme in psychology” (p. 195), and thus allowed researchers to relate their work to others who were exploring similar constructs. Therefore, self-regulation would mean strategy researchers were no longer working within their own bubble of home-grown theory, thus side-stepping difficulties in defining and measuring strategies as *products* of learners’ thoughts and actions, by exploring “the glue and the engine” (Weinstein et al., 2011, p. 47) that drives strategic learning. Tseng et al.’s (2006) seminal study opened the field up to novel ways to research, however all of the studies included in our in-depth review were either validation or adaptation studies of this work, indicating self-regulation has not greatly expanded in its scope since this time. Thus, a significant finding of this review has revealed that self-regulation—at least in the form proposed by Dörnyei (2005)—has yet to fully develop into a flourishing field of study, despite being repeatedly shown to be a robust construct.

A second direction of research has seen the continuation of language learner strategies, with sensitivity to issues raised in past critiques. In a thorough re-imagining of strategies, Gu (2012) looks into strategy research beyond the realms of language learning in order to open up new avenues for strategy research. In his work, he posits a number of key dimensions of variation for a strategy prototype, as well as exploring the importance of context and task. Such work is clearly independent of the strategy research which has preceded it, and also

independent of movements towards self-regulation. However, this type of novel approach was absent in the studies we reviewed, and our findings suggest that strategy research need not be so radical. As illustrated in Ardasheva and Tretter's (2013) work, we can see how the SILL—once the source of much critique—can be adapted in light of recent conceptual debates to produce a more robust, population-specific measure.

Finally, many researchers have argued self-regulation need not spell the end to strategy research, as the two models examine different parts of the same learning process (Gao, 2007) and, thus, may be complimentary. This line of thought has seen the emergence of a third avenue of language learner strategy research, which uses hybrid models for research, or explores how both concepts interact. Hybrid models such as Oxford's (2011) 'strategic self-regulation (S2R) model', have not yet been widely adopted, thus notions of integrated research approaches are still in their infancy. Other scholars have developed their own context-specific hybrid models, such as Author (2017) in his exploration of Japanese language learner strategies, but this was in essence two separate studies (a strategy study and a self-regulation study) carried out on the same population, rather than a fully integrated construct.

In our review, the best example of an integrated model was Teng and Zhang (2016), who investigated the writing strategies of Chinese students learning in English via an original questionnaire that drew on concepts from both strategy research and self-regulation. Rather than just coupling together the two models (as was done in Author, 2017), Teng and Zhang (2016) build their instruments from empirical data, while drawing on both theoretical constructs. However, Teng and Zhang's (2016) research still embodies a strategy-based conceptualization, in that their study examined strategic action as products rather than the

underlying driving force that is self-regulation. Even though this study was conducted as self-regulation research by name, we would argue that it was strategy research by nature, thus drawing parallels to learner strategy inventories of the past (albeit aided by more robust data analysis techniques in this process).

6.2 Current methodologies of research

With regard to methodological approaches in state-of-the-art research, studies included in this review indicated a strong preference towards quantitative approaches to learner strategy research despite the numerous calls for qualitative methods (Tseng et al., 2006; Woodrow, 2005). Notable was the continuing dominance of the SILL (n=11), in contrast to the MSLQ (n=4) and the SRCVoc (n=3), which have been argued to be more robust (Dörnyei, 2005; Dörnyei & Ryan, 2015; Mizumoto, 2012). However, the creation and validation of instruments such as the *SILL-ELL Student Form*, and the *WSSRLQ* pose exciting opportunities to use newly developed or adapted instruments for further research, while operating within the canon of traditional strategy research.

Our findings revealed an underuse of qualitative, in-depth measures, with only two studies utilizing a stimulated recall protocol, which is a data collection methodology that has consistently been highlighted as important to strategy research (Author, 2015; Tseng et al., 2006), although an additional four studies deployed a think aloud protocol which served a similar purpose. Even when qualitative methodologies were used, they were not reported on as widely. This was also true of the Teng and Zhang (2016) study, which reported only the questionnaire data used to analyse the structures of self-regulated L2 writing strategies, despite the collection of considerable qualitative data in think aloud protocols and interviews.

6.3 Conclusion: future directions

This review set out to examine the current state of strategy research in a self-regulation-aware research environment. While the review has revealed that many language learner strategy studies conducted between 2010 and 2016 were either dismissive or unaware of self-regulation, we have nevertheless showcased a number of studies that could act as models of future research with the aim of theory-building in the field.

One group of studies shows how strategy research has continued in a more robust manner, navigating many of the criticisms and issues that have dogged the field in the past. Ardasheva and Tretter's (2013) work has indicated how extant strategy measures can be improved in light of critiques, so future research might also aim to make amendments to other extant measures and methodologies, so as not to discard language learning strategies like the proverbial "baby with the bathwater" (see Author, 2012). Structural Equation Modelling has provided new opportunities to confirm the assumed factorial structures of other strategy constructs, and further explore their relationship with language learning gains.

Another group of studies, mainly centred on vocabulary learning, illustrates how the field can utilize self-regulation constructs, while maintaining strategic learning as a core interest. Ranalli (2012) notes that extant self-regulation research has adopted a volitional model, which is just one archetype in the wider field of self-regulation research. Zimmerman and Schunk (2011) outline no fewer than six other theories of self-regulation, including operant; phenomenological, information processing, social cognitive, Vygotskian, and constructivist. While not all of these are easily applied to the specific task of language learning, there are clear opportunities to explore the effectiveness of other theories to explain the strategic

behavior of language learners. Thus, the field is currently wide open for new studies to drive self-regulation forward, from its somewhat ‘rinse and repeat’ stalled state of replication and validation research.

The final group of studies shows how new paths can be forged, utilizing theory from both self-regulation and language learner strategies. While Teng and Zhang (2016) have operationalized their construct of L2 writing strategies for Chinese learners of English, more work needs to be done to validate this construct and its accompanying instrument for other language learning contexts. Moreover, the methodology of Teng and Zhang (2016) could be used as a template for future investigations into other language skills and learning areas, including L2 listening, reading, spoken communication, and vocabulary learning. There is also an opportunity to explore better ways to integrate process-based self-regulatory items alongside product-based items within new instruments in order to explore strategy products operating within their self-regulatory undercurrents.

Based on the limited number of studies synthesised in this systematic review, it is impossible to argue that one particular direction offers more promise than another; however, it was the final group of studies that captured our attention during our evaluations, and where our weight of evidence scores were highest in the systematic mapping process. We conclude that this is an exciting time to conduct research into strategic learning, because researchers are not bound by a single learner strategy framework nor a single self-regulation framework, and are able to freely explore the notion of strategic learning from a variety of epistemological perspectives. We hope that researchers will continue to explore the field in state-of-the-art ways, avoiding the pitfalls of the past by using this systematic review as a roadmap for future research.

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Appendix 1: Simplified table of studies included in systematic map for review

Study	Focus	Context	L1 → L2	N=	Topic	Methods	Measures
[ID] Anam & Stracke (2016)	LLS	Primary EFL YLs in Indonesia	Indonesia → English	522	LLS preferences/use; relationships between LLS, self-efficacy beliefs, SR learning efficacy	QUAN; Cross-sectional; EFA, Kruskal-Wallis H	C-SILL; C-SELEQ
[ID] Ardasheva (2016)	Hybrid	Primary + secondary ESL YLs in USA	Various → English	805	Relationships between LLS use and reading/math achievement	QUAN; Cross-sectional; CFA, SEM (MIMIC)	L2 proficiency test; Academic achievement measure; SILL; Pre-college ELL motivation scale; Background questionnaire
[ID] Ardasheva & Tretter (2013)	LLS	Primary + secondary ESL YLs in USA	Various → English	1057	Factorial validation of modified SILL for school-aged L2 English learners	QUAN; Cross-sectional; EFA, CFA	Modified SILL
[ID] Cáceres-Lorenzo (2015)	LLS	Secondary CFL YLs in Spain	Spanish / Various bilingual → Chinese	61	LLS frequency and type; LLS relationship to proficiency test scores; effect of mono/bilingualism and gender on LLS use	QUAN; Cross-sectional; ANCOVA	Young Chinese Test (YCT) 2-A1; SILL; Background questionnaire
[LR] Farsani, et al. (2014)	SR	Tertiary (UG) EFL students in Iran	Persian → English	48	Relationships between SR learning, goal-oriented learning and academic writing performance	QUAN; Cross-sectional; PCA, Correlation	Motivated strategies for learning questionnaire (MSLQ); Goal orientation questionnaire; Writing tasks; Background questionnaire
[LR] Grenfell & Harris (2015)	LLS	Secondary CFL YLs in UK	English → Chinese	120	Memorization strategies used by English adolescent learners of Mandarin Chinese	MMR; Cross-sectional; Content analysis; Descriptive statistics; FA	Think aloud; Memorisation strategies questionnaire
[ID] Gunning & Oxford (2014)	LLS	Primary ESL YLs in Canada	Majority French → English	54	Effects of strategy instruction and use on success on oral interaction tasks among sixth graders	MMR; Longitudinal Intervention; Chi Square, Sign test, Mann Whitney U, qualitative content analysis	Oral interaction test; C-SILL (v.2); Background questionnaire; Video recordings; Observation + field notes; Task-based LLS questionnaire

[LR] Hitt & Véliz (2015)	LLS	Tertiary (UG) EFL students in Chile	Spanish → English	31	LLS of successful pre-service teachers in English pedagogy programmes	MMR; Case studies; Descriptive statistics, qualitative content analysis	SILL; Semi-structured interviews; Think-aloud
[ID] Huang (2011)	SR	Tertiary (UG) EFL students in Taiwan	Chinese → English	105	Influence of convergent and divergent assessment on learners' motivation and LLS	QUAN; Cross-sectional; Correlation, MANCOVA	Trait questionnaire (motivation + self-efficacy); Event-specific motivation questionnaire; Event-specific LLS questionnaire
[ID] Kirsch (2012)	LLS	Primary MFL YLs in UK & parents + teachers	English → French; German; Japanese	6+7	LLS repertoires and development of primary school FL learners	QUAL; Longitudinal; Ethnography	Semi-structured interviews; Non-participant observation
[ID] Lam (2015)	SR	Tertiary (UG) EFL students in HK	Cantonese → English	4	How explicit strategy instruction shapes student use of metacognitive knowledge and in what ways this knowledge promotes self-regulation in the learning of writing	QUAL; Longitudinal	Stimulated recall; Interviews; Language learning histories; Text analysis
[ID] Luo & Weil (2014)	LLS	Tertiary (UG/PG not stated) international ESL students in USA	Various → English	65	Frequency of LLS use and differences in LLS use gender, and proficiency level	QUAN; Cross-sectional; ANOVA, MANOVA	SILL (v.7.0); Background questionnaire
[LR] Martirossian & Hartoonian (2015)	SR	Tertiary (UG) EFL students in Iran	Persian → English	100	Relationship between foreign language classroom anxiety and self-regulated learning strategies	QUAN; Cross-sectional; EFA, Correlation	Foreign language classroom anxiety scale (FLCAS); SR section of Motivated strategies for learning questionnaire (MSLQ)
[LR] Mizumoto (2012)	SR	Tertiary (UG/PG not stated) EFL students in Japan	Japanese → English	281	Exploration of relationship between self-efficacy and LLS	MMR; Cross-sectional, ANOVA, Text-mining, correspondence analysis	Vocabulary size test; Open-ended VLS questionnaire; Self-efficacy questionnaire

[ID] Park, Yang & Hsieh (2014)	Hybrid	Tertiary (PG) international ESL students in USA	Various → English	7	L2 readers' information-seeking strategies and decision-making processes as they read online	QUAL; Qualitative content analysis	Observation; Think-aloud; interviews
[LR] Ranalli (2012)	SR	Tertiary (UG/PG not stated) ESL students in USA	Various → English	2	Metacognitive process of vocabulary task definition in discrepant cases from evaluation of an automated, online resource for strategy instruction	MMR; Longitudinal; Intervention; RCT	SRCvoc; Interviews; Motivation questionnaire; Think aloud; Vocabulary test; Confidence measure
[ID] Rochecoust et al. (2012)	LLS	Tertiary (UG + PG) international ESL students in Australia	Various → English	466	Relationship between LLS use and academic achievement (GPA)	MMR; Cross-sectional; Correlation, qualitative content analysis	Questionnaire (derived from SILL, among others); GPA; Interviews
[ID] Author & Co-Author (2013)	SR	Tertiary (UG) international JSL students in Japan	English → Japanese	12	L2 learners' self-regulation for learning the Japanese writing system (kanji)	QUAL; Longitudinal; Case studies, qualitative content analysis	Semi-structured interviews
[LR] Thompson (2012)	Hybrid	Tertiary (UG/PG not stated) L2 Spanish students in USA	English → Spanish	113	Classroom research project that sought to stimulate metacognitive self-monitoring practices	QUAN; Longitudinal; Intervention; Descriptive statistics, Correlation	Metacognitive SR scale of the Motivated Strategies for Learning Questionnaire (MSLQ); Tests of content knowledge in Spanish; Post-test reflection exercises
[ID] Teng and Zhang (2016)	Hybrid	Tertiary (UG) L2 English students in China	English → Chinese	790	Develop and validate and instrument exploring relationship between SR writing strategies and L2 writing.	QUAN CFA (SEM) Multiple regressions	Writing Strategies for Self-Regulated Learning Questionnaire Interviews Writing test
[LR] Tragant & Victori (2012)	LLS	Secondary bilingual EFL YLs in Spain	Catalan+ Spanish → English	402	Relationships between LLS use, age and EFL grades	QUAN; Cross-sectional; ANOVA, T-tests	Strategy questionnaire; EFL course scores
[LR] Tseng, et al. (2015)	SR	Secondary (senior) EFL students in Taiwan	Chinese → English	405 (+116)	Effect of L2 learning orientations and implementation intentions on SR	QUAN; Cross-sectional; EFA, Correlation, Regression.	- Basic competence test - L2 learning orientations scale - Implementation orientations in language learning scale

							- Self-regulatory capacity in language learning scale (SRClang)
[ID] Véliz (2012)	LLS	Tertiary (UG/PG not stated) pre-service EFL teachers in Chile	Spanish → English	2	Psychosocial mechanisms used by pre-service ELTs for the purpose of developing an L2 phonological system	QUAL; Cross-sectional; Case studies; qualitative content analysis	Semi-structured interviews
[ID] Ziegler (2015)	Hybrid	School-aged (Grades 4-9) EFL students in Germany	German → English	572	Relationship between SRCvoc and motivated learning strategies.	QUAN; Cross-sectional; Regression	SRCvoc; Motivated Strategies for Learning Questionnaire (MLSQ)

ID= Judged as suitable for inclusion in our *in-depth* review

LR= Judged to be of *lower relevance* to our review due to weaknesses in focus, methodology or depth