

Editorial: Introduction to the special issue on conducting research syntheses on individual differences in SLA

*We dedicate this study and the special issue to Zoltán Dörnyei,
the most eminent Hungarian applied linguist.*

1. Introduction

As systematic research syntheses and meta-analytic studies are becoming more prominent in the social sciences, especially in the fields of psychology and education, it appears that applied linguists have also started to follow suit (In'nami et al., 2019). One of the main reasons for this is that abundant knowledge has accumulated through the years about second and foreign language (L2) learning and teaching, making the time ripe to systematically synthesize the research findings in order to draw further conclusions and identify paths future studies could take. This is also true for the subfield of individual differences (IDs) research within applied linguistics, where proliferation in the number of studies focusing on individual learner differences with respect to a large variety of issues has been witnessed in the past decades. Hence, we saw it timely to compile a special issue on research synthesis in the subfield of IDs in L2 learning. We formulated the following aims to guide our venture: First of all, we intend to inform scholars of the nature and utility of research syntheses in our field. Second, we hope that the articles included in the special issue would serve as examples for researchers wishing to embark on conducting similar studies. Our third and not negligible aim was to see what tendencies regarding particular individual differences can be outlined based on previous research results. In order for the readers to make the most of these articles, in this editorial introduction we would like to articulate how we see the role of research synthesis in general and meta-

analysis in particular in our field. To this end, we will offer relevant definitions and a short discussion on their utility. We will then move on to outline very generic guidelines for conducting systematic research syntheses, and, finally, we will summarize the studies included in the volume and their contribution to the field of research on IDs.

2. Definition of research synthesis

In applied linguistics it is common to summarize and synthesize literature available on a given topic in order to set the ground for our own empirical work. Indeed, most researchers have compiled literature reviews at the beginning of papers reporting on empirical research in the form of narratives, to provide an overview of a field or subfield and to identify a research niche (either in the form of a gap in our knowledge, an area where evidence has been found to be conflicting, or the emergence of a new phenomenon, which we know very little about) (Chong & Plonsky, 2021b). Usually, these reviews of literature are left to the discretion of the author to select and argue for the necessity of their own empirical work; hence, the works chosen and the way in which their findings are presented rely heavily on the authors' knowledgeability and stance.

Since the turn of the millennium, scholars have started to call for more systematic overviews of literature as opposed to narrative reviews (e.g., Norris & Ortega, 2006; Oswald & Plonsky, 2010) that aim to synthesize what can be known about a particular issue in our field in a more objective manner with the purpose of aggregating the findings, identifying trends or inconsistencies, and outlining future directions in research. Norris and Ortega (2006) label such reviews as research syntheses and identify them as "pursu[ing] systematic (i.e., exhaustive, trustworthy, and replicable) understandings of the state of knowledge that has accumulated about a given problem across primary research studies" (p. xi). This is also the definition that we abided by when putting together the call for this special issue. The main reason for our choice lies in the fact that Norris and Ortega (2006) hold a non-restrictive view on the possible forms of research synthesis (including e.g., meta-analyses, meta-syntheses, qualitative comparative analyses, methodological syntheses). They suggest that the content being synthesized and the purpose of the synthesis is what should be key, with an emphasis on systematicity in selecting the content of the review as well as in analyzing and interpreting the empirical findings. For our purposes, we decided to cast a wide net in terms of research synthesis on IDs and invited contributions to the special issue that were either focused on particular areas of individual differences research, in other words were substantive in nature (Li & Wang, 2018), or had a methodological focus in the form of methodological syntheses (Li & Wang, 2018). Within

these types of syntheses, we considered papers presenting systematic quantitative as well as qualitative reviews of both quantitative and qualitative empirical studies within individual differences research focusing on primary studies' results and/or the methods used.

3. Utility of research syntheses

When discussing the utility and merits of research syntheses, we would like to juxtapose such works with traditional literature reviews. Therefore, first it is important to provide a brief overview of the traditional literature review. The main aim of these reviews is to establish the construct validity of an empirical study (Dörnyei, 2007) and provide a convincing argument about the necessity and rationale of the research niche presented in this study. As empirical studies are conducted in various research contexts, there is no need for an overview of the entire research field, but it is usually necessary to provide contextually relevant information. In addition, a traditional literature review can serve as a basis for a theoretical analysis in which a problem is solved by critically synthesizing various lines of previous research studies. This is in contrast with the main aim of any research synthesis, as stated earlier in this article, to provide an exhaustive overview of the given field of inquiry. As Li and Wang (2018) outline the characteristics of such research synthesis, it becomes clear that these types of studies stand on their own in an attempt to answer specific research questions. In this process, data includes previous research studies with transparent selection criteria and clearly outlined analytical steps. The write-up follows the structure of research studies and remains objective rather than critical; hence the quality of previous studies has a direct impact on the quality of the research synthesis (see Albert & Csizér, this special issue). We are in agreement with Li and Wang's (2018) view who convincingly argue that "traditional reviews and research syntheses have merits, that they serve different purposes, and that they do not have to be mutually exclusive" (p. 124); therefore, it is important to retain their separate roles in good quality research projects. The exhaustive perspective of research synthesis should be counterbalanced by the critical appraisal of the traditional literature review. In addition, traditional literature reviews should try to avoid the subjective selection of articles to serve one's own purposes and instead establish the validity of a given study by providing as broad an overview as necessary.

4. Types of research syntheses

As scholars in various overviews have suggested, there are different ways research syntheses in applied linguistics can be categorized in terms of their focus

and approach (e.g., Chong & Plonsky, 2021b; Li & Wang, 2018). First of all, here we would like to make a distinction between *substantive* and *methodological syntheses*. According to Li and Wang (2018), “substantive syntheses seek to aggregate the results of primary studies and reach conclusions about whether an instructional treatment is effective or a certain relationship exists or how frequently a certain phenomenon occurs” (p. 132), while a “methodological synthesis provides a survey of one or more methodological aspects of the primary research with a view to evaluating whether current practices meet certain criteria and what improvements can be made” (p. 132). Both types of research syntheses can be further categorized according to their approaches being quantitative or qualitative. However, other taxonomies of secondary research types also exist. In their most recent overview, Chong and Plonsky (2021b) describe altogether 13 different types of secondary research studies. Since reviewing all these is beyond the scope of this introduction, we would only like to highlight below those that are directly relevant to our current discussion.

A special type and probably mostly widely known quantitative approach to research synthesis with a substantive focus is *meta-analysis*, which “involves the statistical analysis of the results from more than one study” (Card, 2012, p. 5). More specifically, it uses quantitative methods to synthesize and analyze findings of (quantitative) primary studies with the aim of formulating more general conclusions about the issue under scrutiny. It mainly relies on making inferences from effect sizes as reported or calculated from the reported results of primary studies. This means that meta-analysis is not concerned with analyzing raw data but rather scrutinizes results of several empirical data analyses on the same subject (Card, 2012) or the same construct in order to identify trends at a more general level. As such, Li et al. (2012) state that “meta-analysis is a statistical method used to synthesize the cumulative effect of an interventional treatment or a certain relationship that has been subjected to empirical investigation” (p. 1). The quantitative approach of this type of research synthesis aims to ensure the quality and minimize the subjectivity of the conclusions drawn.

Within the subfield of individual differences research, several studies focusing on motivation (e.g., Al-Hoorie, 2018; Masgoret & Gardner, 2003; Mendoza & Phung, 2019; Yousefi & Mahmoodi, 2021), learning strategies (e.g., Donker et al., 2014; Plonsky, 2011), aptitude (e.g., Li, 2015), age (e.g., Qureshi, 2016), language anxiety (e.g., Botes et al., 2020; Teimouri et al., 2019; Zhang, 2019) and willingness to communicate (Elahi Shirvan et al., 2019; Jin & Lee, 2022) fall into this type of review of primary research. In the current special issue, besides focusing on language anxiety (Piniel & Zólyomi, this special issue), the paper by Botes et al. provides a meta-analysis on research concerning foreign language enjoyment, while Goetze and Driver’s paper focuses on synthesizing research on self-efficacy and achievement.

Although statistical methods offer a relatively straightforward way of aggregating research results of quantitative studies, synthesizing the findings of qualitative studies originating from various research traditions and employing a wide range of data collection and interpretation techniques appears to be more troublesome. Acknowledging the potential problems involved, Norris and Ortega (2006) argue that both quantitative and qualitative summaries of qualitative research findings have been attempted. They claim that quantitative synthesists “superimpose a (post)positivist lens onto a body of interpretive qualitative studies” (Norris & Ortega, 2006, p. 12) in a way that qualitative information is recoded into variables and subjected to statistical analysis. However, the approach, which is probably more in line with the philosophical stance of qualitative researchers, is adopted when a qualitative research synthesis is created. This involves synthesizing the findings of the different qualitative studies with the help of a qualitative analytical technique like the constant comparison method of grounded theory (Maykut & Morehouse, 2002) as stated by Norris and Ortega (2006) and Chong and Plonsky (2021a).

As was explained above, both meta-analyses and qualitative research syntheses comprise rather specific groups of studies within the larger category of research syntheses. In the former, the results of quantitative studies are summarized using statistics, while the latter refer to the aggregation of qualitative research evidence employing qualitative methods. Besides these, there can be many other options when providing a systematic overview of empirical studies. Since none of the remaining review types utilize statistical tests as part of their analytical procedures, they are frequently viewed as employing qualitative analyses despite the fact that their results are often numerical and are based on tallying the occurrence of different constructs, variables, or features.

Some of these research syntheses aim to assess the range and quality of studies conducted so far in order to provide an updated literature search and offer the possibility of informing new research questions without the authors focusing on the aggregation of effect sizes (e.g., on motivation research, see Boo et al., 2015 and Mahmoodi & Yousefi, 2021; on directed motivational currents, see Jahedizadeh & Al-Hoorie, 2021; on aptitude, see Granena & Yilmaz, 2019). The paper by Tajeddin et al. in this special issue also provides an example of this approach. Others tend to investigate the methodological approaches, designs, and tools within a given domain, or concentrate on a particular research technique or tool. Gurzynski-Weiss and Plonsky's (2017) work is an example of this methodological approach synthesizing various methods used to conduct empirical research on interlocutors' individual differences and their influence on interaction, while Mendoza and Phung (2019) looked at the methods used to investigate motivation in learning foreign languages other than English, and Li and Zhou (2021) recently reviewed the methodology of research

on aptitude. Albert and Csizér's paper in this special issue also demonstrates an example of this type of methodological research synthesis.

5. Conducting research syntheses

For research syntheses to be able to formulate well-founded claims based on primary research results or methodologies, scholars have suggested following rigorous standards in gathering, analyzing, interpreting data and reporting the findings. Essentially, we can say that not only meta-analyses (Li et al., 2012) but generally all systematic research syntheses are advised to view the analysis of existing literature as a parallel to conducting empirical studies, where the published works constitute the data itself. This analogy suggests that when compiling a research synthesis, similarly to empirical studies, rigorous standards must be met in planning the study, and in gathering, analyzing, and interpreting the relevant literature (Norris & Ortega, 2006). In the planning phase, the researchers should clearly outline the problem under scrutiny, provide information about the context and a framework including definitions of the concepts the synthesis focuses on. Carrying out the research synthesis involves formulating research questions and designing the methods of collecting and analyzing the literature in a way that is coherent with the research questions. Documenting these steps in a transparent and systematic manner adds to the rigor of research syntheses and thus allows arriving at well-founded conclusions. In the following sections, we will provide more detail concerning the methods that should be kept in mind concerning data collection and analysis when carrying out a systematic research synthesis.

6. Data collection

Continuing with the analogy of empirical studies, in this section we focus on the gathering of the data through the search of the literature, the notion of inclusion and exclusion criteria, as well as coding the data and preparing it for analysis (either quantitative or qualitative). As noted earlier, the data in research syntheses comprise primary individual studies on the chosen topic. Depending on the purpose of the synthesis and the research questions, the appropriate literature must be selected for the review. Specific details concerning the search for this literature should be documented. This includes keeping a record of the databases that were looked at as well as the key words and expressions that were used to run the searches (Norris & Ortega, 2006; Plonsky & Oswald, 2012). It should be transparent for the consumers of the synthesis how the issue of sampling bias was addressed (whether unpublished works or papers in certain languages were prioritized over others for practical reasons) in order to be accountable when

making inferences based on the results. Further inclusion and exclusion criteria should also be explicitly formulated so that the final sample of papers selected for the synthesis are indeed papers that are comparable and relevant to the research focus. When reporting these steps, authors can opt to use flow charts which are straightforward and transparent for the reader (e.g., see Botes et al. in this special issue). Following the selection of primary studies to be included in the synthesis, the data is usually coded for basic and relevant features. The key categories should be listed to provide a comprehensive view of the synthesis that was conducted for the readers and the coding procedures should be documented. To this end, Norris and Ortega (2006) suggest using a code book, while Plonsky and Oswald (2012) recommend a code sheet. For quality insurance, it is also important to account for the reliability of the coding procedure; hence, researchers, besides coding the data, should also employ double-coding and check the consistency of the coders (cf. Li et al., 2012; Plonsky & Oswald, 2012). When reporting the methods used for the research synthesis, these pieces of information should be made available to the readers.

Up till this point, all systematic research syntheses should ideally go through the steps of data collection described above. When preparing the data for analysis, we can make a distinction based on the approach we would like to take. For quantitative analysis of the literature, such as meta-analyses, besides the primary studies' features, information concerning the effect sizes and moderator variables, whose relationships to the construct(s) under scrutiny are also important, should be noted (Card, 2012). The data for quantitative analyses are recorded in a spreadsheet using software which can further assist the researcher in statistical analyses (e.g., *Comprehensive Meta-analysis Software*, Borenstein et al., 2005).

In the case of a qualitative research syntheses and all other types of research syntheses, some of the data can also be extracted with the help of a checklist, such as, for example, details concerning the design, population, data collection instruments used, and so on. This requires data collection methods and recording of the data on spreadsheets, similarly to the procedures employed in the case of meta-analyses but without the need to record statistical details. However, a step that is specific to qualitative research syntheses is that a decision needs to be made concerning the findings with respect to the type of data that is going to be extracted from primary studies (Chong & Plonsky, 2021a). Here options include raw data, interpreted findings, or both. Interview transcripts, recorded and transcribed spontaneous speech, or artifacts used by the participants would all count as raw data, whereas interpreted findings would subsume researchers' discussion and interpretation of these. Chong and Plonsky (2021a) claim that researchers should be consistent with regard to the type of data they extract and they should be ready to justify the reasons for their choices

as currently there seems to be no consensus as to what the best option might be. They also mention that the potentially large amounts of textual data might require the use of computer-assisted qualitative data analysis software (CAQDAS, see e.g., Miles et al., 2018) for effective data management.

7. Data analysis and interpretation

This section begins by summarizing the key aspects of data analysis and interpretation in meta-analytic studies and continues in the same vein with respect to qualitative research syntheses as well as other research syntheses. Overall, however, irrespective of the approach taken, just as in the previous steps, in terms of data analysis and interpretation in systematic research syntheses, clear and transparent documentation is emphasized.

There is a variety of meta-analytic techniques available for researchers to choose from, from the simple to the more complex. Plonsky and Oswald (2012) advise researchers to choose the most reliable, parsimonious, and informative technique for their purposes. Essentially, in the quantitative analysis of primary studies with quantitative results, the effect sizes reported in the empirical studies included in the sample are compared. In addition, their means and variances are calculated in order to make inferences about the trends regarding the constructs under investigation (Norris & Ortega, 2006). Usually, to this end, it is necessary to choose and calculate a standardized index, such as, for example, Cohen's *d*, Hedge's *g*, Pearson *r*, or odds ratio (OR) (Cho, 2015; Li et al., 2012; Norris & Ortega, 2006; Plonsky & Oswald, 2012). For interpretation of effect sizes, Plonsky and Oswald (2012, 2014) emphasize the importance of using field-specific benchmarks and Li et al. (2012) also suggest including confidence intervals, *p*, standard error/standard deviation for all effect sizes and subsequent analyses.

For the comparison of effect sizes, based on relevant theory, researchers can opt for a random-effects model or a fixed-effects model (In'nami et al., 2019). It is also advisable to check the magnitude of heterogeneity of the effect sizes using Q tests (Li et al., 2012; Lipsey & Wilson, 2001). Cho (2015, p. 1) comments:

When the effect sizes are homogeneous, the researcher may estimate the common effect size and construct a confidence interval for the common effect size. Based on the common effect size and the confidence interval, hypotheses for the meta-analysis can be tested. When the effect sizes are not homogeneous, the researcher may try to explain the reasons for variation among the effect sizes by applying moderator analyses.

Moderator analysis is a method used to check whether the heterogeneity of effect sizes is linked with certain study features, especially in the context where the primary studies were conducted. In other words, it can be used to investigate the

possible source of systematic variation in effect sizes. This way, findings of effect size analyses and moderator analyses can further enhance our knowledge on a particular topic in the field (Li et al., 2012).

Finally, researchers conducting meta-analyses should also account for a number of additional issues that can influence the interpretation of the findings. One such point involves taking publication bias into account and presenting a funnel plot along with the results of trim-and-fill procedures (e.g., Duval & Tweedie, 2000). Apart from these, dealing with several effect sizes per study, handling missing data, and considering weighting (Plonsky & Oswald, 2012) should also be ideally addressed and the decisions documented and justified (In'nami et al., 2019). Finally, it is advisable to include a note on measurement and its reliability (e.g., Larsen-Hall & Plonsky, 2015; Teimouri et al., 2019) as well as whether and how correction for artifacts was considered (Card, 2012). Meaningful interpretation of the findings is also of paramount importance. Care should be taken not to jump to conclusions when it comes to large effect sizes (Plonsky & Oswald, 2012). The interpretation of cumulative effects should be done with caution (Norris & Ortega, 2006) and “within/with the help of a frame of reference, refer[ring] to theory, context, constructs of the domain” (p. 38). In this way, the findings of the meta-analysis can provide a more meaningful contribution to the field.

Although Norris and Ortega (2006) offer examples of synthesizing qualitative studies using a quantitative approach, recent guidelines offered by Chong and Plonsky (2021a) tend to favor qualitative approaches in synthesizing qualitative studies. Data extracted from primary studies for the purpose of qualitative synthesis, which, as it was stated earlier, can include either raw data, researchers' interpretations, or both, serve as the starting point of the analysis. Using this data, researchers can adopt either an inductive or deductive approach to analysis. In the case of inductive approaches, the analysis must start from whatever has been extracted from the studies as primary data; this is the approach adopted by grounded theory. When using deductive approaches, there is an already existing framework that researchers can rely on and they need to attempt to fit the extracted data into these predefined categories, if possible. Chong and Plonsky (2021a) list meta-ethnography, narrative synthesis, grounded theory, and thematic analysis as potential interpretive approaches.

The third type of research syntheses we have covered in this introduction usually arrives at its conclusions based on those particular aspects of primary studies that have been tallied, drawing conclusions on the basis of numerical data without the help of statistics. These may focus on either the content or the methodology used in primary studies or both. In this case, there are no well-documented specific guidelines available to adhere to in contrast with meta-analyses and qualitative research syntheses; therefore, following and documenting the data analysis in a rigorous fashion becomes even more important.

8. Reporting research synthesis results

Besides the considerations addressed above, it is also important for authors of research syntheses to generally follow consistent guidelines in terms of reporting such studies. Apart from the pioneering work by Plonsky and associates (e.g., Plonsky & Oswald, 2012) within the field of applied linguistics, the reader is referred to the more general checklist of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page et al., 2021), which has recently been revised. Some journals in other fields, such as medicine, have already started endorsing the use of these guidelines in their instructions for authors for reporting research syntheses; however, we do not yet know of any applied linguistics journal having included PRISMA in their submission guidelines and only a few published articles synthesizing individual differences research refer to using it, especially the flow chart depicting the sampling process (e.g., Botes et al. in this special issue; Jin & Lee, 2022; Yousefi & Mahmoodi, 2022). Nonetheless, based on what we have conveyed in this editorial introduction, we would like to recommend authors of a wide range of research syntheses (including the various types discussed in this editorial) to follow and even perhaps adhere to the PRISMA as much as possible, to add to the rigor in their publications as well as to promote and spread this practice of systematicity in reporting.

Chong and Plonsky (2021a) also provide further guidelines regarding possible ways to report the results of a qualitative research synthesis specifically. They argue that although by using the thematic-narrative approach findings of such studies can be presented in an accessible and reader-friendly manner, this reporting tradition might undermine the trustworthiness of the interpretation since it excludes quotations from primary studies. As a way of circumventing this problem, Chong and Plonsky (2021a) recommend using an evidence-based approach when reporting the findings of qualitative research syntheses, which enhances the trustworthiness by presenting the documented data synthesis process without jeopardizing the smooth flow of the text. They recommend the use and presentation of a detailed coding scheme together with the number of studies that have been coded with that category and a sample code used in one of the primary studies. Moreover, they argue for the inclusion of a data synthesis map, which can help illustrate the relationships between the coded categories. Benefits associated with the use of a data synthesis map include assisting the reader in interpreting the findings and increasing the trustworthiness of the research endeavor.

9. Results of research syntheses in this special issue

The current SI contains five research syntheses that cover individual difference factors from different angles presenting both quantitative and qualitative studies. Emotions

pertaining to language learning constitute an important area of current research within the field of IDs; therefore, we start the SI issue with two studies concentrating on these variables. First, Piniel and Zólyomi present a meta-analysis of 48 studies and show that language anxiety affects language learners in very similar ways as they did not find significant effects of the investigated background variables. Taking a positive psychology perspective, Botes et al. looked at foreign language learning enjoyment and found a positive correlation between enjoyment and willingness to communicate ($k = 97$). These studies not only call our attention to the fact that emotions cannot be ignored when it comes to L2 learning and use but also highlight the importance of positive psychology constructs in the classroom and beyond. Hence, another important construct of positive psychology is included in this SI, namely, self-efficacy: learners need to believe that language learning and use is within their reach. Indeed, Goetze and Driver show ($k = 37$) that self-efficacy is undoubtedly linked to L2 achievement (with variations concerning students' first language, target language and proficiency levels). Their study also underlines the importance of systematically measuring learners' achievement in research on IDs. The next study in this special issue concentrates on an important contextual variable in L2 learning and compared the development of intercultural competence in home and study abroad environments. Tajeddin et al.'s findings indicate that, maybe surprisingly, intercultural competence development practices were largely completed in home contexts. In addition, they uncovered an important research niche as it was pointed out that no study mapped differences in home and study abroad contexts. The final article in this special issue, written by Albert and Csizér, does not concentrate on a single ID variable but, instead, provides a systematic overview of top applied linguistic journals and their treatment of ID variables within the qualitative paradigm. One of their most important results shows that the investigation of cognitive processes in L2 learning seems to be gaining ground in this paradigm. In addition, their appraisal of quality control issues indicates that more rigorous practices need to be employed for reporting practices even in the cases of top journals. The overall conclusion that can be derived from the papers included in this special issue is that even a handful of such studies can show great research variation and point towards fruitful future research directions.

10. Conclusion

It is clearly beyond the scope of this special issue to provide a comprehensive overview of the field of ID variables as their sheer number calls for a book-length work. On completing this project, we became fully aware that such work is much needed within a reasonable timeframe as meta-analytical studies are labor-intensive enterprises and have relatively short shelf-lives. In addition, we could not include all the variables that we intended to due to various reasons, but we clearly see

the need for continuously appraising the development of our field. Apart from advocating for more studies on ID variables, we would also like to emphasize that not only various background variables but also different contexts should be taken into account (cf. Illés, 2020). Contexts should be compared systematically to see their effects on learning and using second/third/foreign languages and learners should also be considered when moving across contexts (e.g., from home study to study abroad and then home study again). In addition, L2 learning and use should be explored separately when it comes to the effects of ID variables as, in the era of globalization, one cannot restrict empirical studies to classroom contexts (Henry et al., 2019). Finally, the research field of ID variables includes various research paradigms, research strategies, and research techniques; hence, systematic research syntheses and meta-analytic studies should also reflect those methodological variations. Our summary shows that it is not only quantitative analysis of effect sizes that uncovers important pieces of information, but that systematic qualitative reviews also contribute significantly to professional discourse.

Acknowledgements

1. We would like to thank the authors and reviewers for their hard work as well as the editors for their patience while we were completing this project. *Studies in Second Language Learning and Teaching* truly feels home to us.
2. Kata Csizér and Ágnes Albert were supported by the Research Program for Public Education Development of the Hungarian Academy of Sciences. Both of them are members of the MTA-ELTE Foreign Language Teaching Research Group.
3. Katalin Piniel completed her work under the aegis of the National Research, Development and Innovation Office in Hungary (NKFI-6-K-129149).

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