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Descriptive Analysis and Meta Analysis of Studies Investigating the Effectiveness of Simultaneous Prompting Procedure

Elif Tekin-Iftar[1], Seray Olcay-Gul[2], and Belva C. Collins[3]

Abstract

Researchers have investigated the simultaneous prompting (SP) procedure across three decades; however, no meta-analysis has been conducted. In the present systematic review, we conducted both a descriptive and meta-analysis of SP studies from a seminal publication of an SP study through 2017. Our search resulted in 20 studies published in English in internationally disseminated peer-reviewed journals that used single-case methodology and also met criteria for methodological rigor. To analyze effect sizes, we used percentage of non-overlapping points and Tau-*U*, with both revealing highly consistent results. We concluded that there is a substantial body of evidence to support the SP procedure to teach a variety of skills to individuals with disabilities when consistent parameters of the procedure are employed; however, future research is needed to specifically validate the procedure as effective in regard to specific types of disability (e.g., autism spectrum disorder) and specific types of tasks.

In the past 50 years, researchers developed and examined the effectiveness of different instructional procedures for teaching various skills to individuals with disabilities. Over the past three decades, researchers have determined that the simultaneous prompting (SP) procedure has been successful in teaching discrete skills (e.g., Creech-Galloway, Collins, Knight, & Bausch, 2013; Tekin-Iftar, Kurt, & Acar, 2008) and chained tasks (e.g., Hudson, Hinkson-Lee, & Collins, 2013; Pennington, Ault, Schuster, & Sanders, 2010) to students with and without disabilities.

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The SP procedure consists of two types of trials: (a) daily probe trials followed by (b) training trials (Collins, 2012; Tekin-Iftar, 2008). Daily probe trials are unprompted and are used to establish baseline performance, assess acquisition of a targeted skill once instruction begins, and assess maintenance from previous instruction. Once the need for

[1]Anadolu University
[2]Hacettepe University
[3]University of North Carolina–Charlotte

Corresponding Author:
Dr. Elif Tekin-Iftar, Anadolu Universitesi, Engelliler Arastirma Enstitusu – 26470, Eskisehir, Turkey.
E-mail: eltekin@anadolu.edu.tr

instruction is determined during daily probe trials, daily training trials take place. Training trials involve the presentation of an individualized controlling prompt (i.e., one that is likely to result in a correct response) immediately following the presentation of a stimulus (e.g., a task direction). The student does not have an opportunity to perform an independent response and is expected to provide a correct prompted response. The instructor continues to conduct daily training trials until criterion is met during daily probe trials, using the same controlling prompt throughout instruction. Because training trials are discontinued once criterion is reached in probe trials, the instructor does not have to fade the prompt by changing its type or intensity.

In addition to using the same prompt throughout training trials, there are other advantages to using the SP procedure compared to other response-prompting procedures (e.g., time delay, most-to-least prompting, system of least prompts). First, there is only one type of correct response (i.e., prompted) during training trials so the instructor does not need to differentiate the student's response (e.g., prompted or unprompted correct response as in the time delay procedure). Second, only one type of instructor behavior (i.e., immediately delivering a prompt) is needed during training trials (e.g., not necessary to change delay interval between stimulus and controlling prompt or to change prompt type). Third, the learner does not have to wait for the prompt (e.g., does not wait a set interval of time to be prompted). Because the SP procedure has these user-friendly characteristics, it is a parsimonious procedure for interventionists (e.g., special or general education teachers, peers, paraprofessionals, parents) to use (e.g., Batu, Bozkurt-Aksoy, & Oncul, 2014; Britton, Collins, Ault, & Bausch, 2015; Tekin-Iftar, 2003; Tekin-Iftar, Collins, Spooner, & Olcay-Gul, 2017).

Although the SP procedure has advantages and has produced promising learning outcomes in individuals with various types of disability, only two descriptive reviews have investigated the effectiveness of the SP procedure to date. Morse and Schuster (2004) systematically reviewed 18 research studies that used single-case methods in terms of demographics (i.e., participants, settings, error rates), procedures (i.e., components of independent variables), and outcomes (i.e., design, results, maintenance, generalization, social validity) and found the SP procedure to be effective in teaching individuals from preschool to adulthood with and without disabilities. They also reported that the SP procedure was delivered with high rates of treatment integrity and that the studies contained positive measures of maintenance and generalization. Almost a decade later, Waugh, Alberto, and Fredrick (2011) reviewed 35 SP research studies using single-case methods with the same variables as Morse and Schuster but adding pupil/teacher ratio as a demographic variable. They also reported that the SP procedure was an effective instructional procedure in teaching discrete skills and chained tasks to individuals with various types of disability, with 126 of 136 participants meeting criterion across studies.

Although the literature reviews by Morse and Schuster (2004) and Waugh et al. (2011) provided groundwork on the effectiveness of the SP procedure, neither examined research studies in terms of quality indicators. In addition, there have been additional SP studies that have published since 2011. Because of these reasons, another comprehensive analysis is needed.

While the former reviews found that the SP procedure was effective in teaching various discrete skills (e.g., sight words, math facts) and chained tasks (e.g., opening key lock, washing hands, purchasing) to individuals with mild to severe intellectual disability, specific learning disability, and typical development, the current analysis includes additional types of disability and skills not included in the past. The ease of using the SP procedure and findings about its effectiveness provided the impetus for this meta-analysis to determine whether it can be recommended as an evidence-based practice.

We conducted this study to determine if the SP procedure can be considered an evidence-based practice for teaching discrete skills and chained tasks to individuals across a variety of

disabilities. To do this, we (a) used the criteria from What Work Clearinghouse (WWC) recommended by Kratochwill et al. (2013); (b) conducted a comprehensive analysis of research studies on the SP procedure for demographics, procedural variables, and outcomes; and (c) analyzed effect size by using percentage of non-overlapping data (PND) and Tau-*U*.

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Method

Search Procedures

We conducted a systematic review to locate studies investigating the SP procedure from January 1990 to December 2017. While Gibson and Schuster's (1992) study was considered the seminal study to investigate the SP procedure, we began our search with 1990 to make sure there were no earlier studies. We located studies via Academic Search Complete, ArticleFirst, EBSCOhost, JSTOR, PsycINFO, ScienceDirect, Worldcat.org, and Web of Science using the keywords *simultaneous, simultaneous prompting*, and *response-prompting* (final search on December 5, 2017). We also reviewed reference lists of the identified articles as well as those of the two previous reviews of the SP procedure to identify additional studies. We then conducted an electronic search of the table of contents, titles, and abstracts of studies in each issue (January 1990 through December 2017) of the following 11 peer-reviewed journals, locating 0 to 21 potential studies for inclusion across each journal: *Education and Training in Autism and Developmental Disabilities* ($n = 21$); *Journal of Behavior Education* ($n = 4$); *Education and Science* ($n = 1$); *Education and Treatment of Children* ($n = 2$); *Educational Sciences: Theory and Practice* ($n = 1$); *Focus on Autism and Other Developmental Disabilities* ($n = 1$); *Research and Practice for Persons With Severe Disabilities* ($n = 1$); *Topics in Early Childhood Special Education* ($n = 1$); *Exceptional Children* ($n = 0$); *Journal of Applied Behavior Analysis* ($n = 0$); and *The Journal of Special Education* ($n = 0$). We selected these journals based on our experience and familiarity with the response-prompting literature base. Finally, we completed an additional ancestral search of the reference lists of the additional identified studies.

Inclusion and Exclusion Criteria

We included studies in the review that met the following criteria: (a) published in English in internationally disseminated peer-reviewed journal, (b) examined effects of SP procedure in teaching skills or tasks, and (c) used single-case research method. Subsequently, 47 out of 70 identified studies met criterion. Of these, we excluded studies comparing the SP procedure to other instructional strategies, comparing the model of instructional delivery, and investigating instructional parameters of the SP procedure, as well as literature reviews. In addition, we excluded studies that (a) incorrectly used the SP procedure (i.e., used more than one type of prompt) or failed to describe (i.e., did not provide enough information regarding how SP used in the study) SP instruction, (b) presented mean data in a table rather than a figure, and (c) presented graphed data that did not match the narrative. As a result, 41 studies met criteria for inclusion in the systematic review.

Procedures for Evaluating Quality Indicators of the Studies

We used the quality indicators recommended by Kratochwill et al. (2013) to evaluate the design quality of the 41 identified studies. We created a data sheet to determine the presence and absence of each indicator within eight categories: (a) systematic manipulation of independent variable, (b) collection of interobserver data for at least 20% of all sessions, (c) interobserver agreement of at least 80% of all sessions, (d) at least three demonstrations of effect, (e) at least five data points

Table 1. Coding Studies According to Kratochwill et al. (2013) Criteria.

Studies	Systematic man. of IV	IOA for 20% of sessions	IOA at or above 80%	At least three demonst. of effect	Five data points per condition	Three data points per condition	Classification of standards	Classification of evidence of effectiveness
Akmanoglu and Batu (2004)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Akmanoglu-Uludag and Batu (2005)	Y	Y	Y	N	N	Y	nMS	—
Batu (2008)	Y	Y	Y	Y	N	Y	MS-R	Strong
Batu (2014)	Y	N	N	Y	N	Y	nMS	—
Batu, Bozkurt-Aksoy, and Oncul (2014)	Y	N	N	Y	N	Y	nMS	—
Birkan (2005)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Britton, Collins, Ault, and Bausch (2015)	Y	N	Y	N	N	Y	nMS	—
Collins, Terrell, and Test (2017)	Y	Y	Y	Y	N	Y	MS-R	Strong
Creech-Galloway, Collins, Knight, and Bausch (2013)	Y	Y	Y	Y	N	Y	MS-R	Strong
Dogan and Tekin-Iftar (2002)	Y	Y	Y	Y	N	Y	MS-R	Strong
Fetko, Collins, Hager, and Spriggs (2013)	Y	Y	Y	Y	N	Y	MS-R	Strong
Fetko, Schuster, Harley, and Collins (1999)	Y	Y	Y	Y	Y	Y	MS	No evidence
Fickel, Schuster, and Collins (1998)	Y	Y	Y	Y	N	N	nMS	—
Gibson and Schuster (1992)	Y	Y	Y	Y	N	N	nMS	—
Gursel, Tekin-Iftar, and Bozkurt (2006)	Y	Y	Y	Y	N	Y	MS-R	Strong
Heinrich, Collins, Knight, and Spriggs (2016)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Hudson, Hinkson-Lee, and Collins (2013)	Y	Y	Y	Y	N	Y	MS-R	Moderate
Karl, Collins, Hager, and Ault (2013)	Y	Y	Y	Y	N	Y	MS-R	Strong
MacFarland-Smith, Schuster, and Stevens (1993)	Y	Y	Y	Y	N	Y	MS-R	Strong
Maciag, Schuster, Collins, and Cooper (2000)	Y	N	Y	Y	N	Y	nMS	—
Ozen, Ergenekon, and Ulke-Kurkcuoglu (2017)	Y	Y	Y	Y	N	Y	MS-R	Moderate
Palmer, Collins, and Schuster (1999)	Y	N	Y	Y	N	Y	nMS	—
Parker and Schuster (2002)	Y	Y	Y	Y	N	Y	MS-R	Strong
Parrot, Schuster, Collins, and Gassaway (2000)	Y	N	Y	Y	N	Y	nMS	—

(continued)

Table 1. (continued)

Studies	Systematic man. of IV	IOA for 20% of sessions	IOA at or above 80%	At least three demonst. of effect	Five data points per condition	Three data points per condition	Classification of standards	Classification of evidence of effectiveness
Pennington, Ault, Schuster, and Sanders (2010)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Pennington, Collins, Stenhoff, Turner, and Gunselman (2014)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Pennington, Stenhoff, Gibson, and Ballou (2012)	Y	Y	Y	Y	N	Y	MS-R	No evidence
Ramirez, Cengher, and Fienup (2014)	Y	Y	Y	Y	Y	Y	MS	Strong
Rao and Kane (2009)	Y	Y	Y	N	Y	Y	nMS	—
Rao and Mallow (2009)	Y	N	Y	Y	Y	Y	nMS	—
Rivera, Hudson, Weiss, and Zambone (2017)	Y	Y	Y	Y	Y	Y	MS	Strong
Sewell, Collins, Hemmeter, and Schuster (1998)	Y	Y	Y	Y	N	Y	MS-R	Moderate
Singleton, Schuster, and Ault (1995)	Y	N	Y	Y	N	Y	nMS	—
Smith, Schuster, Collins, and Kleinert (2011)	Y	N	Y	Y	N	Y	nMS	—
Tekin-Iftar (2003)	Y	Y	Y	Y	N	Y	MS-R	Strong
Tekin-Iftar (2008)	Y	Y	Y	Y	N	Y	MS-R	Strong
Tekin-Iftar, Acar, and Kurt (2003)	Y	Y	Y	Y	N	Y	MS-R	Strong
Tekin-Iftar, Collins, Spooner, and Olcay-Gul (2017)	Y	Y	Y	Y	N	Y	MS-R	Strong
Tekin-Iftar, Kurt, and Acar (2008)	Y	Y	Y	Y	N	Y	MS-R	Strong
Tekin-Iftar and Olcay-Gul (2016)	Y	Y	Y	Y	N	Y	MS-R	Strong
Vuran and Olcay-Gul (2012)	Y	N	N	Y	N	Y	nMS	—

Note. Demonst. = demonstration; IOA = interobserver agreement; IV= independent variable; man. = manipulation; MS = meets standards; MS-R = meets standards with reservations; nMS = does not meet standards; N = no; Y = yes.

per condition (to meet standards), (f) at least three data points per condition (to meet standards with reservation), (g) clarification of design standards, and (h) clarification of evidence for effectiveness. Prior to evaluating the articles, two of us discussed and listed decision rules for each indicator, then independently coded one study and reached 100% consensus through discussion about examples and non-examples of each indicator. Finally, one of us coded quality indicators of each article, examining each tier in a study to determine the presence of an indicator, coding *yes* if all tiers met the indicator in the study and coding *no* if a study failed to meet an indicator in a single tier (see Table 1).

We used the quality indicators recommended by Kratochwill et al. (2013) to evaluate the design quality of the 41 identified studies.

Procedures for Conducting Descriptive Analysis of the SP Studies

For each study that met the quality indicators recommended by Kratochwill et al. (2013), one of us coded the following data for the descriptive analysis: (a) reference and country in which study was conducted, (b) characteristics of participants (i.e., number, age, gender, diagnosis), (c) skill area taught (type of task and assessment), (d) setting and teaching format, (e) research design and reliability data collection, (f) intervention description (e.g., prompt, number of trials, reinforcement, implementer), and (g) social validity, maintenance, and generalization. Table 2 displays the compiled data.

Intervention Effect Calculations

There is a debate in the field of special education as to the most appropriate method to use in synthesizing single-case research designs. The most frequently used technique to calculate effect size is PND (Maggin, O'Keeffe, & Johnson, 2011; Scruggs & Mastropieri, 2001). Although PND can be affected by outliers in baseline condition, Lee, Wehmeyer, and Shogren (2015) argued that PND is a versatile and meaningful method of analysis that can be as successful as other procedures in evaluating the effectiveness of independent variables in studies using single-case designs. PND has several advantages over other techniques for detecting single-case effect size estimates. It does not require linearity, it is easy to calculate, and significant correlations can be found between PND and other effect size estimates (i.e., percentage zero data, mean baseline reduction, regression-based estimates; Campbell, 2004; Olive & Smith, 2005). Tau-*U* (Parker, Vannest, & Davis, 2011) is another non-overlap technique that is suitable for any type of distribution and scale used to calculate effect size (Parker & Vannest, 2012), and it controls for undesirable positive baseline trend in studies. We chose to use both PND and Tau-*U* to calculate the effect size in the study (Losinski, Wiseman, White, & Balluch, 2016).

We conducted baseline-intervention comparison in both effect size estimates in the reviewed studies. Based on guidelines (Scruggs & Mastropieri, 2001), we considered PND scores at or above 90% as "very effective," between 70% and 90% as "effective," between 50% and 70% as "questionable," and below 50% as "ineffective." We considered Tau-*U* scores at or above 93% as "strong effect," between 66% and 92% as "medium to high effect," and between 0% and 65% as "small effect" (Parker & Vannest, 2009). We examined each single-case tier within a study to calculate the PND and Tau-*U* scores through a data extraction process using the software program UnGraph5. One of us digitized data in each tier using UnGraph5 across all studies and then exported extracted data into a Microsoft Excel file for further analysis. We determined PND scores by identifying the highest data point in baseline condition and then identifying the intervention data points that exceeded that point. We calculated PND by dividing the total number of intervention data points above the highest data point by the total number of the data points of the comparison condition and multiplying by 100. We calculated Tau-*U*

Table 2. Coding Demographical Parameters for the Selected Articles.

Studies, country	Participants: Age, number, gender, label	Skill area: Type, discrete or chained, assessment	Settings Teaching format	Research design/ reliability DV/IV	Intervention description: Prompt, no. of trials, reinforcement, SP interventionist, chained task format, other instructional procedures	Social validity/ Maintenance/ Generalization
Akmanoglu and Batu (2004), TR	6–17; 2 M, 1 F; autism, ID	Academic, discrete	School 1:1	MP/B Yes/Yes	Model+verbal prompt, 6 trials, verbal+tangible rein., CR, researcher	Yes (mothers)/ Yes/Yes
Batu (2008), TR	6–9; 3 M, 1 F; ID 30–50; 3 mother, 1 grandmother	Functional, chained, SO	School/home 1:1	MP/B Yes/Yes	Model+verbal prompt, 2 trials, verbal+tangible rein., CR, parents, TTF	Yes (mothers)/ Yes/Yes
Birkan (2005), TR	8–13; 2 M, 1 F; Down S., MID, MoID	Academic, discrete	School 1:1	MP/B Yes/Yes	Model+verbal prompt, 9–10 trials, verbal+tangible rein., CR-VR4, researcher	No/Yes/Yes
Collins, Terrell, and Test (2017), U.S.	16–19; 2 M, 2 F; MID	Vocational, chained, SO	School 1:1	MP/P Yes/Yes	Verbal prompt, 1 trial, verbal rein., CR, researcher, TTF, IF	Yes (part.)/Yes/ No
Creech-Galloway, Collins, Knight, and Bausch (2013), U.S.	15–17; 3 M, 1 F; MoID	Academic, chained, SO	School 1:1	MP/P Yes/Yes	Model+verbal and verbal+physical prompt, 3 trials, verbal rein., CR-VR3, researcher, TTF	No/Yes/Yes
Dogan and Tekin-Iftar (2002), TR	4–6; 2 M, 1 F; MID, MoID	Academic, discrete	School 1:1	MP/P Yes/Yes	Model+verbal prompt, 10 trials, verbal+tangible rein., CR-FR10-FR15, researcher	Yes (mothers)/ Yes/Yes
Fetko, Collins, Hager, and Spriggs (2013), U.S.	12–14; 2 M, 1 F; MoID, ASD 13; 2 M, 1 F; peers	Functional-academic, discrete-chained, MO-SO	School 1:1	MB/P Yes/Yes	Verbal+gestural prompt, 1 trial, verbal+tangible rein., CR, peers, TTF, IF	No/Yes/No
Fetko, Schuster, Harley, and Collins (1999), USA	17–20; 1 M, 3 F; SID	Vocational, chained, MO	School 1:1	MP/P Yes/Yes	Model prompt, NA, verbal+tangible rein., CR-VR3, researcher, TTF	No/Yes/Yes
Gursel, Tekin-Iftar, and Bozkurt (2006), TR	11–14; 2 M, 3 F; Down S., MID, MoID	Academic, discrete	School Group	MP/B Yes/Yes	Model+verbal prompt, 9 trials, verbal rein., CR-VR3-VR5-FR9, researcher, IF, OL	No/Yes/Yes
Heinrich, Collins, Knight, and Spriggs (2016), USA	16–17; 2 M, 1 F; VI-MoID, ASD 45–57; 2 F; para. 17; 1 F; peer	Academic-functional, discrete-chained, SO	School 1:1	MP/P Yes/Yes	Verbal model prompt, 2 trials, verbal rein., CR-VR3, para., peer, NA	Yes (teachers, peers)/Yes/ Yes

(continued)

Table 2. (continued)

Studies, country	Participants: Age, number, gender, label	Skill area: Type, discrete or chained, assessment	Settings Teaching format	Research design/ reliability DV/IV	Intervention description: Prompt, no. of trials, reinforcement, SP interventionist, chained task format, other instructional procedures	Social validity/ Maintenance/ Generalization
Hudson, Hinkson-Lee, and Collins (2013), U.S.	10–11; 2 M, 2 F; ADHD, EBD	Academic, chained, SO	School 1:1	MP/P Yes/Yes	Verbal+model prompt, 1 trial, verbal+token rein., CR, researcher, TTF, IF	Yes (teachers, part.)/Yes/Yes
Karl, Collins, Hager, and Ault (2013), U.S.	15–18; 3 M, 1 F; MoID, MID	Academic-functional, discrete-chained, MO	School Group	MP/B Yes/Yes	Verbal+model prompt, 1-5-20 trials, verbal rein., CR, researcher, TTF	No/Yes/Yes
MacFarland-Smith, Schuster, and Stevens (1993), U.S.	21–37 months; 2 M, 1 F; PD, DD, Down S.	Academic, discrete	School 1:1	MP/B Yes /Yes	Verbal prompt, 12 trials, verbal rein., CR-VR3, researcher	No/Yes /Yes
Ozen, Ergenekon, and Ulke-Kurkcuoglu (2017), TR	5–6; 2 M, 2 F; DD	Academic, discrete	School Dyads	MP/B Yes/Yes	Model prompt, 8–10 trials, verbal+tangible rein., CR, researcher, OL	Yes (doc. studs.)/Yes/Yes
Parker and Schuster (2002), U.S.	15–19; 1 M, 3 F; ID, TD	Academic, discrete	School Group	MP/B Yes/Yes	Verbal prompt, 8-9-10-12 trials, verbal rein., CR, researcher, IF+OL	No/Yes/Yes
Pennington, Ault, Schuster, and Sanders (2010), U.S.	7–10; 3 M; ASD 2 F; teachers	Academic, chained, MO	School 1:1	MP/P Yes/Yes	Gestural prompt, 3 trials, verbal rein., CR, teacher, TTF	No/Yes/Yes
Pennington, Collins, Stenhoff, Turner, and Gunselman (2014), U.S.	7–10; 5 M; ASD 1 teacher, 1 para.	Academic, discrete	School 1:1	MP/B Yes/Yes	Gestural prompt, 3 trials, verbal+activity rein., CR, teacher+para., IF	Yes (teachers)/ Yes/Yes
Pennington, Stenhoff, Gibson, and Ballou (2012), U.S.	7; 1 M; ASD 1 F; teacher	Academic, discrete	School 1:1	MP/B Yes/Yes	Gestural prompt, 3 trials, verbal rein., CR, teacher	No/Yes/Yes
Ramirez, Cengher and Fienup (2014), U.S.	12–14; 3 M; ASD	Academic, chained, PP	School 1:1	MB/P Yes/Yes	Model+verbal prompt, 1 trial, verbal+social+token rein., CR, researcher, TTF	Yes (teachers, director)/No/ Yes

(continued)

Table 2. (continued)

Studies, country	Participants: Age, number, gender, label	Skill area: Type, discrete or chained, assessment	Settings Teaching format	Research design/ reliability DV/IV	Intervention description: Prompt, no. of trials, reinforcement, SP interventionist, chained task format, other instructional procedures	Social validity/ Maintenance/ Generalization
Rivera, Hudson, Weiss, and Zambone (2017), U.S.	6–8; 2 M, 1 F; DD, MoID	Academic, discrete	School 1:1	MP/P Yes/Yes	Verbal model prompt, 5 trials, verbal rein., CR, researcher	Yes (teacher, para.)/Yes/Yes
Sewell, Collins, Hemmeter, and Schuster (1998), U.S.	23–25 months; 2 F; DD	Functional, chained, MO	School 1:1	MP/B Yes/Yes	Physical+verbal prompt, 2–3 trials, verbal+natural rein., CR-VR3, TTF, researcher	Yes (parents)/ Yes/No
Tekin-Iftar (2003), TR	10–13; 2 M, 2 F; MID, Down S. 10–13; 4 F; tutors	Functional, discrete	School 1:1	MP/B Yes/Yes	Verbal prompt, 12–15 trials, verbal rein., CR, peers, IF	No/Yes/Yes
Tekin-Iftar (2008), TR	7–12; 2 M, 2 F; ASD, ID 30–55; 3 mother, 1 grandmother	Functional, chained, SO	Community settings 1:1	MP/B Yes/Yes	Model+verbal prompt, 1 trial, verbal rein., CR, parents, TTF	Yes (mothers, part.)/Yes/Yes
Tekin-Iftar and Olcay-Gul (2016), TR	10–11; 3 M; ASD	Academic, discrete	School Group	MP/B Yes/Yes	Verbal model prompt, 9 trials, verbal rein., CR, researcher, IF, OL	Yes (part.)/Yes/ Yes
Tekin-Iftar, Acar, and Kurt (2003), TR	13–14; 2 M, 1 F; ID	Functional, discrete	School 1:1	MP/B Yes/Yes	Verbal prompt, 15 trials, verbal rein., CR-VR3, researcher	No/Yes/No
Tekin-Iftar, Kurt, and Acar (2008), TR	7–8; 2 M; ID	Functional, discrete	School 1:1	MP/B Yes/Yes	Verbal prompt, 12 trials, verbal rein., CR, researcher, IF	No/Yes/Yes
Tekin-Iftar, Collins, Spooner, and Olcay-Gul (2017), U.S. and TR	12–13; 3 M; ASD 25–46; 1 M, 2 F; general ed. teacher	Academic, discrete	School 1:1	MB/Dyads Yes/Yes	Verbal model prompt, 9 trials, verbal rein., CR, teachers, IF	Yes (teachers, part.)/Yes/Yes

Note. ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorder; CR = continuous reinforcement; DD = developmental delay; doc. studs. = doctoral students; Down S. = Down syndrome; DV = dependent variable; EBD = emotional and behavior disorder; F = female; FR = fixed ratio; gen. = generalization; general ed. teacher = general education teacher; ID = intellectual disability; IF = instructive feedback; IV = independent variable; main. = maintenance; M = male; MB/B = multiple baseline design across behavior; MB/Dyads = multiple baseline design across dyads; MID = mild intellectual disability; MO = multiple opportunity; MoID = moderate intellectual disability; MP/B = multiple probe design across behavior; MP/P = multiple probe design across participants; NA = not available; OL = observational learning; para. = paraprofessional; part. = participants; PD = physical disabilities; PP = permanent product; rein. = reinforcement; SO = single opportunity; SP = simultaneous prompting; TD = typical development; TR = Turkey; TTF = total task format; U.S. = United States; VR = variable ratio.

scores using the web-based Tau-*U* calculator at http://www.singlecaseresearch.org (Vannest, Parker, & Gonen, 2011).

Determination of an Evidence Base for Using the SP Procedure

We evaluated the studies as *meets standards* and *meets standards with reservations* together against the criteria for evidence-based practices recommended by Kratochwill et al. (2013). We had three criteria (5-3-20 rule): (a) minimum of five studies categorized as *meets standards* and *meets standards with reservations*, (b) practice conducted by at least three groups of researchers with no overlapping authorship from three different geographic regions, and (c) total number of participants included in combined studies equaling at least 20.

Reliability

First, two of us obtained 100% agreement regarding the inclusion and exclusion of all of the studies in the systematic review. Subsequently, we conducted four reliability analyses in the study that included (a) quality indicators, (b) descriptive analysis, (c) UnGraph5 digitized data, and (d) PND and Tau-*U* calculation. We used a point-by-point method to determine the percentage of interrater reliability by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100. One of us collected reliability data independently from randomly selected studies.

For the quality indicators, two of us independently coded 41.5% ($n = 17$) of randomly selected articles and obtained 98.5% (range = 87.5%–100%) agreement. After evaluating the articles according to Kratochwill et al.'s (2013) criteria, we retained 20 articles for descriptive analysis. In this analysis, two of us independently coded 40% ($n = 8$) of randomly selected articles and obtained 96.3% (range = 88.2%–100%) agreement. In cases of disagreement, the same two researchers reexamined the coded articles and achieved a consensus on each parameter of the quality indicators and descriptive analysis. Two of us also digitized 40% ($n = 8$) of randomly selected articles for reliability. Reliability analysis for digitizing the data using UnGraph5 resulted in 98.5% agreement (range = 97%–100%). Given human error involved in using UnGraph5 (i.e., if the mouse cursor was slightly off the midpoint of a data point, the rounding error could change the value of the data point), we operationalized agreement as the value of two data points being identical or one unit apart (i.e., below or above). For example, if one of us coded a data point as 30, another could code the same data point as 29 or 31 and this would be counted as correct in the reliability analysis. One of us calculated PND scores of 40% of the same studies selected for reliability analysis using UnGraph. Reliability analysis for the calculation of PND and Tau-*U* resulted in 99% (range = 98%–100%) and 100% agreement, respectively.

Results

Quality Indicators of Single-Case Studies

As stated in the methods and shown in Figure 1, we found 41 studies that met the criterion to be included in our meta analysis.

Data on the quality of the single-case research studies reviewed in this investigation can be found in Table 1. Of the 41 studies, we rated three (7.32%) as *meets standards* and 24 (58.54%) as *meets standards with reservations*. We rated the remaining 14 (34.14%) studies as *does not meet standards*. The most common reasons that we did not rate studies as *meets standards* or *meets standards with reservations* were insufficient data points in each condition and low reported interobserver agreement data. We did not include these studies in the descriptive analysis. We included a total of 27 studies as *meets standards* or *meets standards with reservations* for visual analysis in the study. We classified the studies into three groups in terms of classification of evidence of effectiveness: (a) strong effect, (b) moderate effect, and (c) no effect. Across the 27 studies, we classified 17 (62.96%) as having strong effect, three

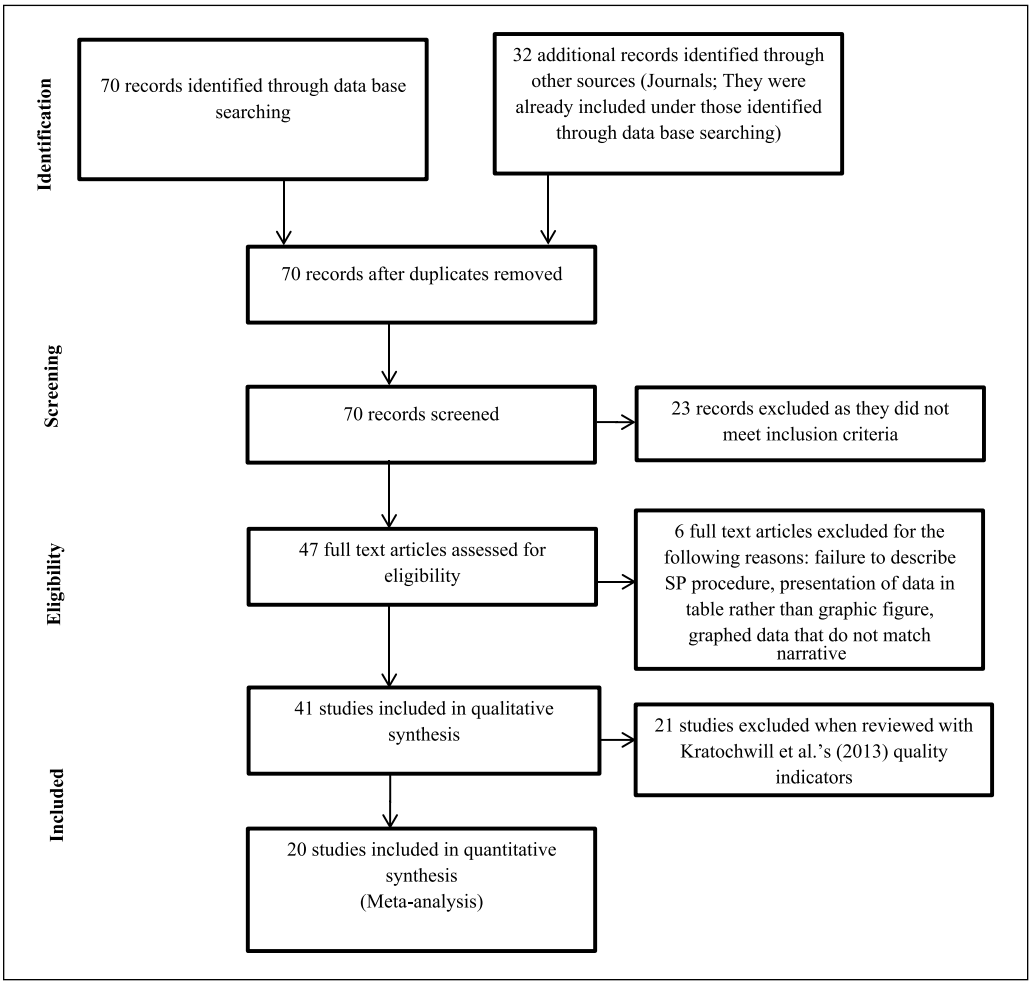

Figure 1. Procedures followed during search.

(11.11%) as having moderate effect, and seven (25.93%) as having no effect.

Descriptive Analysis of SP Articles

We included 27 studies that met the quality indicators recommended by Kratochwill et al. (2013) in the descriptive analysis. Demographic and procedural characteristics of the studies are presented in Table 2. Researchers most frequently investigated the effects of the SP procedure in the United States (n= 15) with 50 participants and in Turkey (n= 11) with 38 participants, including one study we conducted through collaboration across the United States and Turkey. Three participants took place in this study.

Participants. The reviewed studies included a total of 91 participants, two thirds male (n= 59) and one third female (n= 32). The majority were from elementary school, ages 6 to 11 years, with 38 participants (n= 14; e.g., Tekin-Iftar et al., 2008); followed by middle school, ages 12 to 14 years, with 21 participants (n= 9; e.g., Fetko, Collins, Hager, & Spriggs, 2013); secondary school, ages 15 to 21 years, with 24 participants (n= 7; e.g., Parker & Schuster, 2002); and finally, preschool, ages birth to 5 years, with eight participants (n= 5; e.g., Dogan & Tekin-Iftar, 2002).

Investigators have predominantly examined the effects of the SP procedure with individuals with intellectual disability (n= 45;

e.g., Batu, 2008). They also have conducted research with individuals with ASD ($n = 22$; e.g., Ramirez, Cengher, & Fienup, 2014); developmental disabilities ($n = 8$; e.g., Ozen, Ergenekon, & Ulke-Kurkcuoglu, 2017); multiple disabilities, such as intellectual disability, cerebral palsy, and developmental disabilities or physical disabilities and developmental disabilities ($n = 10$; e.g., MacFarland-Smith, Schuster, & Stevens, 1993); attention deficit hyperactivity disorder ($n = 3$; Hudson et al., 2013); typical development ($n = 2$; e.g., Parker & Schuster, 2002); and emotional and behavioral disorders ($n = 1$; i.e., Hudson et al., 2013).

Skills taught. Investigators have used the SP procedure to teach academic skills to 64 participants ($n = 19$; e.g., Gursel, Tekin-Iftar, & Bozkurt, 2006), functional skills to 29 participants ($n = 9$; e.g., Batu, 2008), and vocational skills to eight participants ($n = 2$; e.g., Collins, Terrell, & Test; 2017). They focused on teaching discrete skills to 62 participants in 19 investigations (e.g., Gursel et al., 2006) and chained tasks to 42 participants in 12 investigations (e.g., Tekin-Iftar, 2008). To assess chained tasks, investigators used a single-opportunity method with 26 participants (e.g., assessed performance on a task analysis until error was made; e.g., Hudson et al., 2013) in seven studies and a multiple-opportunity method with 16 participants (e.g., discontinued assessment when an error was made; e.g., Fetko et al., 2013) in five studies. Assessment in one study consisted of permanent product recording with three participants (i.e., Ramirez et al., 2014).

Settings and teaching format. The studies predominantly took place in school settings with 83 participants ($n = 25$) but also in both participants' homes and schools with four participants ($n = 1$; i.e., Batu, 2008) and a community setting with four participants ($n = 1$; i.e., Tekin-Iftar, 2008). Most studies consisted of SP training and probe trials in a 1:1 instructional arrangement with 71 participants ($n = 22$; e.g., Collins et al., 2017); however, some consisted of training trials conducted in small-group formats with 16 participants ($n = 4$; e.g., Karl, Collins, Hager, & Ault, 2013) or dyads with four participants ($n = 1$; i.e., Ozen et al., 2017) with acquisition assessed in 1:1 daily probe sessions.

Research design and reliability. Investigators predominantly used a single-case multiple probe design across participants with 28 participants ($n = 8$; e.g., Creech-Galloway et al., 2013) or across behaviors replicated across participants with 54 participants ($n = 16$; e.g., Karl et al., 2013) in their studies; however, investigators used a multiple baseline design across participants design in two studies with six participants (e.g., Fetko et al., 2013) and a multiple baseline design across dyads in one study with three participants (i.e., Tekin-Iftar et al., 2017). They included dependent and independent variable reliability analyses in 27 of the 27 studies.

Intervention description. SP interventions have consisted of various types of prompts that include verbal and model prompts with 37 participants ($n = 10$; e.g., Creech-Galloway et al., 2013), verbal prompts with 20 participants ($n = 6$; e.g., Parker & Schuster, 2002), verbal model prompts with 12 participants ($n = 4$; Rivera, Hudson, Weiss, & Zambone, 2017), gestural prompt with nine participants ($n = 3$; e.g., Pennington et al., 2010), physical and verbal prompts with six participants ($n = 2$; e.g., Sewell, Collins, Hemmeter, & Schuster, 1998), model prompts with eight participants ($n = 2$; i.e., Ozen et al., 2017), and gestural and verbal prompts with three participants ($n = 1$; i.e., Fetko et al., 2013). The interventions also consisted of various types of reinforcement, which included verbal praise with 91 participants ($n = 27$; e.g., Tekin-Iftar, 2003), tangibles with 23 participants ($n = 7$; e.g., Ozen et al., 2017), tokens with seven participants ($n = 2$; e.g., Ramirez et al., 2014), social reinforcers with three participants ($n = 1$; i.e., Ramirez et al., 2014), naturally occurring reinforcers with two participants ($n = 1$; i.e., Sewell et al., 1998), and verbal and activity reinforcers with five participants ($n = 1$, i.e., Pennington, Collins, Stenhoff,

Turner, & Gunselman, 2014). In the majority of interventions ($n = 27$; e.g., Tekin-Iftar et al., 2017), the interventionist delivered reinforcement on a continuous schedule to criterion across 91 participants. Across the studies using continuous reinforcement schedules, the interventionist changed to a variable ratio schedule of delivery for 27 participants ($n = 8$; e.g., Gursel et al., 2006) or a fixed ratio schedule of delivery for eight participants ($n = 2$; e.g., Dogan & Tekin-Iftar, 2002) to fade reinforcement once criterion was met.

In teaching chained tasks, interventionists most often used a total task format (taught all steps of a chained task in sequence at the same time; $n = 11$; e.g., Tekin-Iftar, 2008) across 39 participants. In addition to teaching targeted tasks, some investigations assessed acquisition of nontarget information added to instruction with 37 participants ($n = 10$; e.g., Hudson et al., 2013) as well as observational learning of other tasks with 16 participants ($n = 4$; e.g., Parker & Schuster, 2002). In most cases, investigators conducted the SP intervention across 61 participants ($n = 18$; e.g., Hudson et al., 2013; Ramirez et al., 2014), but parents conducted the intervention across eight participants ($n = 2$; e.g., Batu, 2008; Tekin-Iftar, 2008), peers conducted the intervention across 10 participants ($n = 3$; e.g., Fetko et al., 2013; Tekin-Iftar, 2003), teachers conducted the intervention across 12 participants ($n = 4$; i.e., Tekin-Iftar et al., 2017), and paraprofessionals conducted the intervention with eight participants ($n = 2$; e.g., Heinrich, Collins, Knight, & Spriggs, 2016). (Note: Some teachers had a dual role as investigator and interventionist; e.g., thesis research, collaborative research; e.g., Sewell et al., 1998.)

Social validity. The SP procedure was found to be socially valid in the studies in which investigators collected social validity data. Whereas nine studies did not include social validity, investigators in 14 studies across a total of 48 participants analyzed social validity data collected from participants' parents for 16 participants ($n = 5$; e.g., Dogan & Tekin-Iftar, 2002), participants' teachers for 21 participants ($n = 6$; e.g., Hudson et al., 2013), the participants themselves for 21 participants ($n = 6$; e.g., Tekin-Iftar, 2008), the school director for three participants ($n = 1$; i.e., Ramirez et al., 2014), paraprofessionals for nine participants ($n = 2$; e.g., Rivera et al., 2017), peers for three participants ($n = 1$; i.e., Heinrich et al., 2016), and graduate students for three participants ($n = 1$; i.e., Ozen et al., 2017).

Maintenance and generalization. Analyses of maintenance and generalization data showed the SP procedure to be effective in promoting maintenance and generalization of acquired skills. All but one investigation addressed maintenance (i.e., Ramirez et al., 2014). Investigators reported maintenance data for 88 participants. Investigators reported collecting maintenance data between 1 and 15 weeks following withdrawal of the SP procedure. Most investigations addressed generalization of the SP procedure across a total of 79 participants ($n = 23$; e.g., Creech-Galloway et al., 2013), including generalization across materials for 44 participants ($n = 13$; e.g., Tekin-Iftar et al., 2008), across settings for 21 participants ($n = 6$; e.g., Karl et al., 2013), across persons for 32 participants ($n = 9$; e.g., Batu, 2008), and across tasks or stimuli for 19 participants ($n = 6$; e.g., Hudson et al., 2013).

Determination of an Evidence-Based Practice

From the results of this review, the SP procedure can be considered as evidence based for teaching individuals with intellectual disability and ASD. First, the criterion requiring a minimum of five studies categorized as *meets standards* and *meets standards with reservations* was met in that six studies had acceptable methodological rigor to support the SP procedure (i.e., Batu, 2008; Fetko et al., 2013; Gursel et al., 2006; Parker & Schuster, 2002; Ramirez et al., 2014; Rivera et al., 2017). Second, the criterion requiring that studies be conducted by at least three researcher groups with no overlapping authorship from three different geographic regions was met in that six of the above-cited studies were conducted by six

Table 3. Percentage of Nonoverlapping Data and Tau-*U* Calculations for Simultaneous Prompting.

	Intervention				Intervention		
Study	PND	Tau-*U*	Number of tiers	Study	PND	Tau-*U*	Number of tiers
Batu (2008)	97.40%	97.59%	12	Parker and Schuster (2002)	96.16%	98.08%	12
Collins, Terrell, and Test (2017)	84.58%	86.90%	4	Ramirez, Cengher, and Fienup (2014)	100%	100%	6
Creech-Galloway, Collins, Knight, and Bausch (2013)	100%	100%	4	Rivera, Hudson, Weiss, and Zambone (2017)	100%	100%	3
Dogan and Tekin-Iftar (2002)	85.83%	85.14%	3	Sewell, Collins, Hemmeter, and Schuster (1998)	87.23%	97.09%	6
Fetko, Collins, Hager, and Spriggs (2013)	92.87%	91.53%	3	Tekin-Iftar (2003)	100%	100%	12
Gursel, Tekin-Iftar, and Bozkurt (2006)	90.03%	93.46%	14	Tekin-Iftar (2008)	97.92%	100%	12
Hudson, Hinkson-Lee, and Collins (2013)	79.75%	83.55%	4	Tekin-Iftar, Collins, Spooner, and Olcay-Gul (2017)	100%	100%	3
Karl, Collins, Hager, and Ault (2013)	95.67%	95.26%	16	Tekin-Iftar, Acar, and Kurt (2003)	82.46%	82.53%	9
MacFarland-Smith, Schuster, and Stevens (1993)	78.05%	76.36%	12	Tekin-Iftar, Kurt, and Acar (2008)	97.21%	98.07%	6
Ozen, Ergenekon, and Ulke-Kurkcuoglu (2017)	96.45%	96.64%	12	Tekin-Iftar and Olcay-Gul (2016)	100%	100%	9

different research groups from different regions in the United States and Turkey. Third, the criterion requiring that results be demonstrated across a minimum of 20 participants was met in that results in the above-cited six studies were demonstrated across 22 participants.

Effects of SP Instruction

We determined the effects of the SP procedure by using PND and Tau-*U* calculations for the meta-analysis of this systematic review. We applied these procedures to the 20 studies that met the classifications of *meets standards* and *meets standards with reservations* and classification of evidence of effectiveness criteria recommended by Kratochwill et al. (2013). Table 3 displays the PND and Tau-*U* scores calculated across the 20 studies using baseline–intervention comparisons as well as the number of tiers analyzed for these comparisons. Of the studies presented in Table 3, only Fetko et al. (2013) conducted effect size analysis.

PND results from baseline–intervention comparison suggest that the SP procedure was "very effective" in 14 studies (e.g., Creech-Galloway et al., 2013; Tekin-Iftar, 2008) and "effective" in six studies (e.g., Hudson et al., 2013). Tau-*U* results from baseline–intervention comparison suggest that the SP procedure had a "strong effect" in 14 studies (e.g., Parker & Schuster, 2002) and "medium to high effect" in six studies (Collins et al., 2017). We also ran a

Spearman rho test to analyze the consistency between PND and Tau-*U* scores. We obtained a significant relation between PND and Tau-*U* scores during baseline–intervention condition comparisons ($r_s = .85$, $p < .01$).

Discussion

In summary, the SP procedure appears to be an evidence-based practice in general for teaching a variety of skills to individuals with a variety of labels across the age span (i.e., preschool to adult) in that 20 of the reviewed studies met a sufficient number of the criteria identified by Kratochwill et al. (2013) to "meet design standards" or "meet design standards with reservations." In addition, across all 20 studies, a meta-analysis using PND found the SP procedure to be "very effective" or "effective," and a meta-analysis using Tau-*U* found the SP procedure to have a "strong effect" or "medium to high effect."

It should be noted that we found only published studies that produced positive effects while recognizing the possibility that studies where the SP procedure failed to have a positive effect may have been conducted but gone unpublished. Because the SP procedure is flexible and single-case research allows formative analysis, those who use the procedure have the liberty to adjust some of the variables based on formative data (e.g., changing the type of prompt or reinforcement) to ensure positive outcomes. Although it is possible that researchers have conducted some unpublished studies in which positive effects were not obtained, this study did not include unpublished dissertations or unpublished research reports. Subsequently, we identified 70 published studies of which 41 met criterion to be included in this systematic review of the SP procedure.

Although specific variables (e.g., type of prompt, schedule of reinforcement, discrete vs. chained task, single- vs. multiple-opportunity assessment, academic vs. functional skill, type of reinforcement, inclusion of nontargeted information) may differ across the implementation of the SP procedure, the basic components across studies remain the same. The inclusion of interobserver and procedural reliability data across investigations serves to strengthen believability in the effectiveness of the SP procedure. In addition, the fact that researchers have implemented the SP procedure with so many variations speaks to the flexibility of the procedure as an instructional option that is likely to be effective when its basic components are implemented with fidelity.

One limitation in all of the reviewed studies was that only two studies (Ramirez et al., 2014; Rivera et al., 2017) required a minimum of five data points to establish stability of data during baseline condition. This was most evident on the first tier of implementation because subsequent tiers most often consisted of five or more baseline data points over time. In spite of the minimal number of baseline data points used to establish stability in the initial tier across studies, the investigators in all studies implemented intervention after stability was established without a therapeutic trend across at least three data points in the first tier, and the majority of the studies showed a relatively high percentage (over 80%) of non-overlapping data points from baseline to intervention conditions, as shown in Table 3. It is noteworthy that the Tau-*U* analysis provides results within a few percentage points. Although the PND technique does not control for baseline trend, the Tau-*U* analysis does (Parker et al., 2011). The findings showed that the scores obtained through both techniques were highly consistent. Thus, the studies reviewed in this meta-analysis appear to have had stability during baseline intervention with no therapeutic trend, and as Lee et al. (2015) stated, when PND is implemented correctly, it can be as successful as other techniques for identifying evidence-based practices.

As required by Kratochwill et al. (2013), the required number of independent researchers have conducted studies on the effectiveness of the SP procedure across the required number of geographic locations, although it is apparent that researchers at specific locations have been predominant in investigating the procedure. This is to be expected, given the fact that

researchers in special education typically identify a sustained line of research, obtain external funding to implement their research, and influence their students to continue in the selected line of research at the home university or at other universities where they may be subsequently employed. What is interesting about the development of the line of inquiry into the SP procedure is that it has occurred across two countries. The explanation for this is simple. The genesis of the SP procedure occurred under Dr. John Schuster at the University of Kentucky (UK), where researchers were involved in the investigation of a variety of response-prompting procedures (e.g., time delay, system of least prompts). In a thesis study, Gibson and Schuster (1992) built the case for the SP procedure when they noted that it did not seem necessary to systematically fade a prompt by increasing the delay interval when research on the time delay procedure had demonstrated that the transfer of stimulus control was often immediate following initial 0-s-delay trials. Subsequent investigations by Schuster, his colleagues, and their students strengthened the empirical support for the effectiveness of the SP procedure. As described by Collins, Tekin-Iftar, and Olcay-Gul (2017), Dr. Tekin-Iftar from Turkey completed a year and a half of study with Dr. Schuster and his colleagues at UK. When she returned to Turkey, she began a research agenda with colleagues and students that was parallel to the research on the SP procedure being conducted at UK and other sites in the United States, and the investigation of the SP procedure ultimately extended across independent researchers and disciplines in Turkey. Thus, the SP procedure can be verified as being an instructional procedure used with persons with disabilities across these two countries.

Although this meta-analysis builds a strong case for the effectiveness of the SP procedure, continued research on its parameters and employment by new groups of researchers in other geographic areas will serve to strengthen the argument for the SP procedure as an evidence-based practice. More research needs to be focused on specific variables, as Browder, Wakeman, Spooner, Ahlgrim-Delzell, and Algozzine (2006) did when they conducted a meta-analysis to specifically determine that the constant time delay procedure was an evidence-based practice for teaching reading to students with significant cognitive disabilities.

This meta-analysis revealed that researchers have used the SP procedure across participants with a large variety of disabilities across age groups as well as across a large variety of skills. The case needs to be made that the SP procedure is a valid procedure for each type of disability (e.g., ASD, mild to severe intellectual disability), with attention given to each age group. In addition, the types of skills for which SP is best suited need to be further investigated across both academic (e.g., writing, vocabulary development, math content) and functional (e.g., self-help, communication, leisure, vocational) domains. Also, the number of settings in which the procedure is used needs further investigation, with particular attention to the effectiveness of the SP procedure when embedded in ongoing instruction in an inclusionary classroom, where students with and without disabilities participate in the same lesson.

One limitation to this investigation is that we found it difficult to discern between various labels given to participants. This was especially the case when students had more than one identifying label (e.g., Down syndrome and developmental delay or communication delay) or a label where the ability of the participant was not evident (e.g., autism, emotional and behavioral disorders), as is often the case in special education. Another limitation is that a number of studies targeted more than one type of skill to be taught with the SP procedure (e.g., Karl et al., 2013), as can be the case when functional and academic content are intermixed. Although this demonstrates the flexibility of the SP procedure to address different needs and content within the same study, it makes it difficult to state that a single study had the single purpose to validate the procedure with a specific population or with a specific skill.

The lack of information in some of the studies also limits the ability to conclude the best way to implement the SP procedure. For example, some investigators did not

state whether they used a single-opportunity or multiple-opportunity method of assessing chained tasks. Thus, it is necessary to take into account the reasoning of the researchers in conducting the SP procedure with the specific variables (e.g., type of prompt, number of trials) that they used, and those who subsequently implement the procedure must make their own instructional decisions based on the same sound reasoning.

In conclusion, while it is clear that ongoing research on the SP procedure is merited, it also is evident that instructors should feel confident in selecting the procedure to teach a wide range of skills across students with a wide range of disabilities. As noted by Collins (2012), instructors who use systematic instructional procedures that employ response prompting have a number of effective techniques from which to select (e.g., system of least prompts, time delay). Thus, they must ask themselves this question: Which procedure is best for teaching what to whom? Given the ease with which the SP procedure can be implemented due the use of a single prompt and the lack of monitoring a delay interval, the SP procedure may be the most parsimonious option; however, it is always best to make instructional decisions based on formative data collection, as each instructional context may differ.

In conclusion, while it is clear that ongoing research on the SP procedure is merited, it also is evident that instructors should feel confident in selecting the procedure to teach a wide range of skills across students with a wide range of disabilities.

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