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Tactics to Ensure Durability of Behavior Change Following the Removal of an Intervention Specialist: A Review of Temporal Generality Within Organizational Behavior Management

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ABSTRACT

The endurance of behavior change over time, including the time period after a behavior specialist has ceased to offer direct services, is an important consideration for both organizational behavior management and behavior analysis in general. This article considers a dozen strategies labelled temporal generality tactics that may foster the maintenance and institutionalization of intervention efforts in organizational settings. The use of such tactics was examined by conducting a comprehensive review of articles published between 1977 and 2014 in the Journal of Organizational Behavior Management. The results of this review suggest that although follow-up measures are frequently collected, explicit and proactive strategies to systematically increase the success of long-term behavior change are rarely used or researched.

For the average person, the value of science most likely does not come from demonstrations of functional relationships, verifications of hypotheses, achievements of statistical significance, the cohesion of theoretical explanations, or other similar scientific activities and outcomes. The general public is more interested in technology derived from the application of science and how such applications can improve their lives in lasting ways. This has relevance not just for application of science in general but for applied behavior analysis as well. As Baer, Wolf, and Risley (1968) pointed out in their seminal article delineating the scope of applied behavior analysis, the field needs to achieve practical improvements with the behaviors that are considered to be socially important. In that same article, they also outlined the attributes of applied behavior analysis, one of which was that any application of behavioral science should show many forms of generality.

The generality of behavior can include the extension of behavior change across settings, responses, and time (Foxx, 2013). Generality across settings

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will be shown when behavior established under one set of conditions also appears under a novel set of conditions. Within organizational behavior management (OBM), it is common to try to foster this type of generality when conducting training, wherein it is hoped that the behaviors developed in training situations will generalize to on-the-job situations. For example, a trainer may conduct training in an environment that shares features with the on-the-job environment, such as a realistic simulation or the on-the-job environment itself during off hours, in the hope that the new behaviors will transfer to normal working conditions (Brethower & Smalley, 1998). Generality across responses is shown when, in the process of modifying a targeted behavior, other nontargeted behaviors begin to vary in a similar manner (Austin & Wilson, 2001; Ludwig, 2001). For example, an intervention to increase one class of targeted safety behaviors (e.g., wearing earplugs) may also increase other nontargeted safety behaviors (e.g., wearing safety glasses). If properly capitalized on, such generality across settings and behaviors may represent an efficient means of promoting new behavioral relations with a minimal investment of intervention.

Although these types of generality are critical issues within OBM, the current article concerns itself with the generality of behavior change across time. In particular, this article explores the durability of intervention effects after the intervention specialist (i.e., an OBM consultant or researcher in charge of performance change) has been removed from the workplace environment and direct consultation. As mentioned previously, the value of applied behavioral science comes from not just creating behavior change but creating a *lasting* change in behavior. With organizational clients, it is important not just that performance improvements occur in the presence of an OBM consultant or researcher but that the organization continues to benefit after that individual leaves and the organization must manage the target performance on its own. There is little practical value for an organization if performance improvements disappear as soon as the consultant or researcher leaves the project, and it is debatable as to whether such temporary improvements should even be considered evidence of effectiveness (Foxx, 2013). The endurance of OBM successes over time is potentially how consultants can build notable reputations for their services and how researchers might demonstrate their value and the value of this science to society at large. The long-term continuation of OBM intervention outcomes may be one of the most important aspects of OBM, and other empirically grounded consultants could benefit from research on the durability of interventions. Thus, it is important to understand how to best maximize the durability of behavior change over time, including the time period after the consultant or researcher has withdrawn his or her direct services.

Some OBM scholars have argued for differentiating between types of generality over time by distinguishing between maintenance and institutionalization (Boyce & Geller, 2001). Maintenance of behavior change in behavior analytic research has been defined in many different ways. Some have defined maintenance as resistance to extinction (Kazdin, 1994), whereas others have referred to maintenance as a generalization of behavior change over time (Stokes & Baer, 1977). For the purposes of this article, *maintenance* is described as a type of durability across time in which the target behavior continues to occur after the intervention implemented by a consultant or researcher has been removed from the setting. In contrast, *institutionalization* refers to the partial or full continuation of an intervention by the organization after the consultant or researcher has departed the setting. Whereas maintenance must be programmed into the experimental design of an intervention, institutionalization is up to the discretion of the organization for which the intervention is implemented, thus making it naturally more difficult to directly manipulate. For example, a consultant could implement a series of training sessions to help salespeople identify behaviors that they could engage in to improve their rate of successfully closing a sale. If those salespeople continued to engage in these new behaviors following the cessation of the training sessions, then this would be an example of maintenance, because the direct contingencies of the intervention have been removed but the behavior change persists. In another example, a consultant may develop a new feedback and incentive system to improve sales. If management decides to continue the practices of this new system after the consultant leaves, then this would be considered institutionalization, because the intervention contingencies are still being implemented even though the consultant is no longer present. For the remainder of this article, the terms *maintenance* and *institutionalization* are used in this manner.

Although the distinction between maintenance and institutionalization is logical and defensible, it does raise some problems. As Fleming (2001) pointed out, any emphasis on maintenance will imply that the goal is always to remove an intervention, which is not always appropriate for certain types of interventions, including some of the most common interventions within OBM, such as feedback, goal setting, and incentives. Furthermore, for long-term maintenance to be successful, the work environment requires the availability of natural reinforcers to maintain the newly acquired behaviors in strength. Unfortunately, many environments are unlikely to offer sufficient rates of reinforcement for the continuation of a newly acquired behavior, even if the consultant took a low rate of reinforcement into account when designing the intervention (Foxx, 2013; Stokes & Baer, 1977). For example, some have referred to sales as an extinction business (Feeney, Staelin, O'Brien, & Dickinson, 1982), in the sense that within certain industries, the majority of sales attempts will likely end in rejection for the

salesperson even when he or she is performing correctly. Although some may persist given a learning history that has established the response products associated with sales attempts as reinforcing irrespective of the client reaction (i.e., automatic reinforcement), such repertoires may prove too idiosyncratic to uniformly build a successful salesforce. For most individuals in the absence of a contrived contingency, it is unlikely that appropriate sales behavior will persist in the presence of repeated natural failures. As Malott (2001) pointed out, there is the "myth of perpetual-behavior intervention" (p. 100), which refers to the notion that a behavioral intervention will be sustained even in the absence of future consequences so long as the original intervention has properly thinned out reinforcement. Malott argued that this is a naïve error and that behavior analysts should presume that the normal work environment will need to be modified on a long-term basis to provide artificial consequences if sustained change is desired.

It is worth pointing out that there may be situations in which maintenance can be assumed even in the absence of institutionalization—namely, when there are natural sources of reinforcement but some knowledge or skill deficit prevents the individual from coming into contact with these reinforcers (McSween & Matthews, 2001). When an intervention leaves the client with a new repertoire that allows for a self-sustaining behavioral relation to emerge naturally between that person's behavior and the work environment, one can expect maintenance without further contrived endeavors. Unfortunately, this largely restricts maintenance to issues related to acquisition (i.e., "can't do" problems) and therefore neglects motivational issues (i.e., "won't do" problems) that require the continuation of an active intervention for successful generality across time. Even within the realm of behavior acquisition, it is often the case that newly acquired forms of behaviors will not be sustained without some form of regularly programmed consequences. Furthermore, in the process of simply altering an individual's repertoire, the natural environment itself is being changed because a new set of relations between behavioral tendencies and environmental conditions has been established. This has led many authors to propose that the distinction between maintenance and institutionalization is false or, at best, unclear (Boyce & Roman, 2002; Kessler, 2001).

These considerations suggest that the durability of behavior change over time should be viewed not as the passive outcome resulting from an intervention but as part of the intervention itself (Stokes & Baer, 1977). If maintenance is limited to knowledge and skill acquisition within contexts in which natural reinforcement is readily available, this means that OBM consultants and researchers cannot rely on a momentary intervention to produce the lasting changes valued by clients. Rather, as Baer et al. (1968) stated, "generalization should be programmed, rather than expected or lamented" (p. 97). Given the intertwined nature of maintenance and

institutionalization and the importance of developing lasting change for both acquisition and motivational issues, this article looks at the topic of durability across time broadly by subsuming both maintenance and institutionalization under the more inclusive label of *temporal generality*. Such generality could be assessed in the form of follow-up data and probes collected after a delay of the consultant or researcher's absence, data collected immediately regarding the success of on-site workers and managers in self-managing some intervention program, or some combination of these forms of data.

Reports on the absence of follow-up data collected in OBM interventions can be traced back as early as 1986. To determine the typical focus of OBM technology, Redmon and Lockwood (1986) examined the standard consultation methodology in terms of 10 categories (pre-entry into the organization, organization entry, goal setting, procedure selection, role definition, implementation, evaluation, maintenance, withdrawal, and follow-up). The authors found that all studies considered the middle phases of intervention implementation and evaluation, but very few considered the beginning phases or the last few phases, including maintenance and follow-up.

In many ways, the need for a better understanding of temporal generality echoes the call for a better understanding of behavioral systems analysis in OBM (Diener, McGee, & Miguel, 2009; D. A. Johnson, Casella, McGee, & Lee, 2014). With both areas, there is an emphasis on looking beyond the immediate change in behavior or the middle stage of consultation and instead looking more extensively at the broader context of relevant organizational factors. With behavioral systems analysis, the emphasis centers on understanding these factors prior to an intervention (i.e., pre-entry and entry), whereas with temporal generality, the emphasis centers on understanding these factors subsequent to the intervention (i.e., maintenance, withdrawal, and follow-up). Furthermore, effectiveness with generality may require an understanding of organizational systems and processes (Redmon, 1991). For example, an intervention that boosts productivity in one division of the organization may also divert resources from another division or place undue pressure on other divisions. If an incentive program developed for the marketing department comes at the cost of resources for the research and development department, this may create hostility between these two departments. Likewise, if an improvement in productivity by a sales division places an unsustainable demand on the production division, the production division may attempt to counteract the intervention. At an individual level, if an increase in supervisor monitoring improves the quality of manufactured parts but also creates additional work for that supervisor with no additional benefit, this intervention is unlikely to be maintained by the supervisor. In these cases, a failure to consider the overall functioning of the entire organization may create elements within the organization that will work in

opposition to the long-term maintenance of the behavior change as the disadvantaged parties lobby to repeal the recent innovations.

Even without opposition, there may be a need to conduct more systemic analyses to increase the probability of an intervention being retained. For example, in order for a safety intervention to be adopted for an extended period of time, it may be necessary to demonstrate to the decision-making executives that reduced injuries are not only good for the physical health of the workers but also good for the financial health of the business (e.g., reduced compensation, reduced fines, reduced insurance rates). Without such a demonstration, the executives may decide that injuries are simply the cost of doing business. This is important because most interventions will produce behavioral side effects beyond the targeted behaviors, and these side effects, even if short term in duration, may interfere with the long-term success of the intervention (Boyce & Geller, 2001). Success in temporal generality may require a broad understanding of many organizational factors and an identification of why behavior change would be beneficial to the key players within that organization over the long run.

The literature has proposed many suggestions to improve the durability of behavior change beyond the original intervention. In their discussion of generalization, Stokes and Baer (1977) described several strategies for promoting the generalization of behavioral interventions. The authors classified these strategies into the following categories: (a) train and hope, (b) sequential modification, (c) introduce to natural maintaining contingencies, (d) train sufficient exemplars, (e) train loosely, (f) use of indiscriminable contingencies, (g) program common stimuli, (h) mediate generalization, and (i) train to generalize. Training sufficient exemplars, training loosely, programming common stimuli, and training to generalize are generalization methods mostly targeted at generality across stimuli or behaviors, rather than time, and thus are not discussed in further detail. The remaining five strategies formulated by Stokes and Baer represent plans that could promote generality across time and therefore are considered in greater detail here. For the sake of clarity and consistency, the tactics listed by Stokes and Baer and subsequent strategies are commonly referred to as *temporal generality tactics* in this article.

As seen with Table 1, the first temporal generality tactic is to intervene and hope (slightly renamed from "train and hope" to expand its scope beyond training situations), which involves the delivery of an intervention with no programmed efforts to promote generality. Any instances of generalization across settings, behaviors, or time are simply hoped for and documented. This is perhaps the most commonly implemented training procedure, although it may be one of the least effective. It may be slightly misleading to label this as a tactic because any instances of generality are not the result of

Table 1. Summary of Temporal Generality Tactics.

Tactic	Description
Intervene and hope	Involving the delivery of an intervention with no programmed efforts to promote generality. Any instances of generalization across settings, behaviors, or time are simply hoped for and documented.
Sequential modification	Involving the delivery of an intervention with no programmed efforts to promote generality. However, if generalization is not seen, additional interventions are conducted across conditions. If generalization occurs, the results of the intervention are simply noted.
Introduce to natural maintaining contingencies	Natural sources of reinforcement are identified in the individual's normal environment. The intervention is then developed to teach new and appropriate forms of behavior that will be maintained by the natural sources of reinforcement in that environment.
Use of indiscriminable contingencies	Involving contingencies in which reinforcement is delivered on an intermittent schedule, such that the instances in which reinforcement will or will not be delivered appear undifferentiated to the recipient of the reinforcers.
Mediate generalization	Mediation of behavior change is accomplished through the use of verbal behavior and, more specifically, through the use of rules to promote behavior change.
Behavioral systems analysis	Involving a comprehensive and multilevel analysis of the organization in advance of intervention development.
Promotion of social validity	Collecting information on social validity prior to development and implementation of the intervention. Such assessments provide information regarding conditions to promote or inhibit the temporal generality of intervention effects within that organization.
Use of instructional design factors	Involving the manipulation some instructional feature, such as teaching or assessment techniques, to promote retention over time.
Involvement in intervention design	Internal workers (management/nonmanagement) help to develop the intervention and the features related to the intervention prior to implementation.
Training internal staff	Internal workers are explicitly trained to implement the intervention themselves.
Formal data collection system	Internal workers are trained to collect data on performance measures.
Formal system of dispensing consequences	Internal workers are tasked with delivering the consequences to other workers as part of the planned intervention.

intentional planning, but it is included for the sake of classification because of its common occurrence.

The second temporal generality tactic is labelled *sequential modification*. This strategy is similar to intervene and hope efforts in that there is only a very minimal level of analysis dedicated to promoting generalization. Once again, an intervention is implemented and then any subsequent generalization is noted. However, sequential modification goes beyond passive observation in that if generalization is not seen, additional interventions are conducted across conditions. For example, if an intervention developed a new behavior during a workshop session, but the behavior did not then generalize outside of the workshop, the intervention would then be repeated under additional conditions outside of the workshop. The intervention would continue to be repeated until the behavior was reliably occurring across all appropriate settings. In regard to temporal generality, the intervention could be implemented and then the effects observed at a later date. If behavior

change was not observed at that later time, the intervention could be implemented once again, and this pattern would continue until the behavior change was stable over time (i.e., retraining or booster sessions). Again, this is one of the least analytic strategies because it merely involves a simple repetition of the intervention whenever generality fails to occur.

The third tactic is labelled *introduce to natural maintaining contingencies*. In this plan, natural sources of reinforcement are identified in the individual's normal environment. The intervention is then developed to teach new and appropriate forms of behavior that will be maintained by the natural sources of reinforcement in that environment. As discussed earlier, this plan is limited to situations in which natural reinforcement exists to a sufficient degree to reliably maintain behavior.

The fourth tactic involves the *use of indiscriminable contingencies*. Indiscriminable contingencies are those in which reinforcement is delivered on an intermittent schedule, such that the instances in which reinforcement will or will not be delivered appear undifferentiated to the recipient of the reinforcers. Lottery systems and other types of incentive programs are among those interventions in the OBM literature utilizing indiscriminable contingencies.

The fifth temporal generality tactic, and the final one discussed by Stokes and Baer (1977), is to *mediate generalization*. This mediation is typically accomplished through the use of verbal behavior and, more specifically, through the use of rules to promote behavior change. Rules and rule-governed behavior are commonly used as parts of multicomponent interventions.

Additional temporal generality tactics beyond those formulated by Stokes and Baer (1977) should be considered as well. As suggested earlier, attempting to identify and minimize sources of resistance to interventions as well as aligning the various parties and processes with the intervention may facilitate the long-term success of intended behavior change. Such efforts are more likely to be successful when a comprehensive analysis of the organization is conducted in advance. Thus, the use of *behavioral systems analysis* could be considered a sixth temporal generality tactic.

A common concern within OBM involves employee buy-in (Boyce & Roman, 2002). One consideration for improving buy-in is to ensure that the intervention is acceptable to clients—that is, the intervention has social validity. The use of social validity assessments has been an integral part of determining the impact of various interventions in the OBM literature. Initially proposed by Kazdin (1977) and Wolf (1978), the assessment of social validity in applied behavior analysis has been an important focus since its original inception. However, current perspectives on social validity have focused on simply asking how satisfactory various aspects of an intervention are to the individuals involved (Kennedy, 2002). Thus, the most

common use of social validity typically does not include information related to the durability of behavior change. However, if social validity measures are included, they may provide information regarding conditions to promote or inhibit the temporal generality of intervention effects within that organization. In other words, social contexts may not always support newly learned behavior or provide an occasion for these behaviors to occur; thus, this information may be used to determine the environments and social contexts that will most likely foster these new behaviors. Thus, the *promotion of social validity* is being included as a seventh temporal generality tactic.

In regard to newly learned materials, a number of strategies within behavior-based instructional design have been proposed to not only make learning efficient and effective but promote retention over time (Markle, 1990; Tiemann & Markle, 1990). That is, in the process of ensuring that learners have fully mastered the contents of an instructional lesson, those learners are also more likely to retain the newly acquired knowledge or skills. This category would include techniques such as the use of appropriate rational sets for conceptual stimulus control or training to fluency (D. A. Johnson, 2014). This category could also include less systematic attempts at instructional design as well, such as repeated practice during training. The common attribute within this category is that the trainers attempt to improve retention by manipulating some instructional feature, such as teaching or assessment techniques. Thus, the *use of instructional design factors* will be considered as an eighth temporal generality tactic.

Sigurdsson and Austin (2006) conducted a review of institutionalization, and their classification system proposed four strategies aimed at promoting institutionalization, which can be included in the current article's proposed temporal generality tactics. As suggested by Sigurdsson and Austin, a ninth temporal generality tactic could be considered *involvement in intervention design*. With this plan, the internal workers help develop the intervention and the features related to the intervention. There are several reasons why this plan might promote generality, such as an increase in social validity, the potential for internal workers to select more realistic goals, and the probability that selected incentives are more likely to be effective.

A 10th tactic involves the proposal of *training internal staff*. With this strategy the internal workers are explicitly trained to implement the intervention themselves. Another tactic to increase temporal generality is the development of a *formal data collection system*. As part of this plan, internal workers are the ones who collect data. With the 12th temporal generality tactic, *formal system of dispensing consequences*, the internal workers are tasked with delivering the consequences to other workers as part of the planned intervention. With all three of these tactics, the long-term promotion of an intervention is facilitated by getting the internal workers involved

in the active implementation of the various aspects of the intervention before the services of the consultant or researcher are fully withdrawn.

Each of the 12 temporal generality tactics outlined here have been used to some extent in OBM interventions, although to varying degrees and with varying levels of success. However, many of these categories were largely derived from applied behavior analysis as a whole and were not examined within the specific context of OBM-related situations. Although these tactics are logical extensions that are likely to result in generality, such extensions have not been empirically proven. Thus, there remains a need for a comprehensive review of tactics that promote temporal generality within OBM settings.

One of the earliest studies to attempt this was conducted by Redmon and Lockwood (1986). Although the researchers concluded that very little data existed on the practices of maintenance, this study was never formally published and only a minimal summary of the data can be found in a later publication by Redmon (1991). A more formal review was later conducted by Boyce and Geller (2001), who reviewed maintenance in the area of behavior-based safety. Boyce and Geller found that the incentive programs that were most effective in promoting maintenance were relatively short (3–5 weeks) and implemented in larger organizations. In addition, the most successful programs were those that offered workers the choice to participate in the program and utilized on-site workers to deliver the incentives/rewards to fellow employees rather than having a researcher deliver them. According to Boyce and Geller, feedback interventions that produced maintenance shared certain key characteristics: (a) They focused on several behaviors, (b) feedback was dependent on overall safe performance rather than individual behaviors, (c) feedback emphasized safe performance and recognition for success, and (d) feedback was delivered by on-site workers instead of researchers. The majority of the research that reported successful maintenance also included some sort of training component. The authors suggested that through the delivery of feedback on overall safe performance, maintenance is promoted by the use of indiscriminable contingencies because delivery of feedback was not necessarily contingent on one specific behavior but on a set of behaviors. Although these results were promising, the review was too limited to allow for strong claims regarding temporal generality. The Boyce and Geller review only included 23 studies and did not consider any applications of OBM outside of safety interventions. Furthermore, the review looked exclusively at maintenance effects (note that incentives and feedback were withdrawn before the assessment of behavior change) and therefore omitted studies that could be classified as institutionalization.

As mentioned earlier, Sigurdsson and Austin (2006) conducted one of the more comprehensive reviews of temporal generality within OBM, looking specifically at the extent to which institutionalization of behavior change

processes has been programmed into OBM interventions. The authors included studies published between 1991 and 2002. In order to be considered a maintenance phase, follow-up or maintenance data had to be collected for at least half of the dependent variables. As previously mentioned, in addition to follow-up data, the authors used a classification system of institutionalization as suggested by McSween and Matthews (2001) and Grindle, Dickinson, and Boettcher (2000). The authors found that a report of follow-up data following the termination of experimenter involvement was collected in 16 of the 31 studies reviewed, and the scope of the duration of follow-up or maintenance periods stretched from 10 days to 4 years.

The review by Sigurdsson and Austin (2006) discovered that the incorporation of institutionalization factors was a strong determinant of the long-term success of behavior change and further contributed to the field's understanding of how to promote temporal generality. However, there are some important limitations to the paper as well. Just as Boyce and Geller's (2001) review was largely focused on the topic of maintenance, Sigurdsson and Austin's review was largely focused on a consideration of factors that promote institutionalization. Sigurdsson and Austin did include reports of maintenance, but they did not carefully analyze factors that could promote temporal generality in the absence of institutionalization. Although Sigurdsson and Austin expanded their scope to include all areas of OBM, not just safety as was the case with Boyce and Geller, it was still restricted to only the time period between 1991 and 2002. Thus, a potentially large number of studies from both before and after that time period were neglected. To date, we are aware of no formal comprehensive reviews of the temporal generality of OBM interventions that incorporate factors that may influence both maintenance and institutionalization.

The *Journal of Organizational Behavior Management* (*JOBM*) is a professional journal dedicated to publishing OBM research in both applied and lab settings. Beginning with an initial review conducted by Balcazar, Shupert, Daniels, Mawhinney, and Hopkins in 1989, there have been reviews of studies published in *JOBM* for three decades, with each review measuring the extent to which articles published in *JOBM* are meeting the specified objectives of the journal. Although these reviews were not specifically examining the tactics that promote generality, they did include measures on the collection of formal follow-up data. Specifically, Balcazar et al. reported that the durability of intervention effects is not reported in more than 30% of research reports. A decade later, Nolan, Jarema, and Austin (1999) reported that a much larger percentage (approximately 31%) of studies in the first decade (1977–1987) provided follow-up data than in the second decade (approximately 20%). Furthermore, the authors reported that no studies documented the collection of follow-up data in 1987, 1989, 1994, or 1995.

The third review of *JOBM*, conducted by VanStelle et al. (2012), reported similar results for the third decade (1998–2009), in that an average of 24% of studies reported follow-up data. The VanStelle et al. review demonstrated that OBM interventions have repeatedly been shown to be effective in a wide variety of settings and employee populations. Most of this published research begins with the collection of baseline data in a control condition in which the treatment of interest is not in effect, followed by the collection of data with the treatment implemented. Depending on a number of variables, the length of the intervention period will vary widely among interventions. In typical OBM research, the researcher will terminate his or her involvement in the study following a determined length of time. Given the mission of the journal and the fact that many of the scholars who publish within the journal do formally withdraw their services to the organization at some point, it is a well-suited outlet for analyzing the durability of behavior change over time for OBM interventions. Thus, the purpose of this article is to review tactics that may promote temporal generality as reported in *JOBM* from 1977 to 2014.

Method

Inclusion criteria

All studies published in *JOBM* between 1977 and 2014 were selected for initial review. The titles and abstracts of all articles published within this time frame were reviewed in order to exclude nonexperimental studies from this study. Thus, only those articles that included the manipulation of at least one independent variable were evaluated for the inclusion of follow-up measures. Not included in this review were conceptual papers, review articles, or articles that did not include original presentations of data. As a result, 311 articles were carefully read to determine whether the author(s) reported the collection of follow-up data, and only those articles reporting follow-up data were selected for further review. As seen in Table 2, the final count of articles included in this review was 53. Articles involving multiple experiments were separated and independently evaluated by the reviewers. Thus, an absolute total of 63 studies were selected for analysis.

Interobserver agreement (IOA)

The first stage of calculating IOA involved selecting articles for inclusion in this review; consensus was assessed for nine of the 34 volumes (approximately 27%). IOA for this preliminary stage of the review was 96.1%. The second stage of calculating IOA involved the classification of included articles. Of the 63 studies included in this review, 18 (approximately 28%) were

Table 2. Summary of Publications Involving Temporal Generality.

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Amigo et al. (2008)	Task clarification and manager verbal and graphic feedback	Training internal staff	Management was trained to deliver feedback	8 weeks	Five sessions (26 observations)	2 weeks	N/A	54%
Anderson et al. (1983)	Checklist, feedback, and token economy	(a) Involvement in intervention design, (b) sequential modification, (c) use of indiscriminable contingencies, and (d) promotion of social validity	(a) Employees assisted in the development of the checklist; (b) researchers adjusted the checklist, implemented a prorated point-exchange system, and modified the room-check procedures; (c) supervisors randomly evaluated one or two rooms per week; and (d) participants were surveyed on preference of the intervention	3 weeks	Weekly (random checks)	45 days	Survey for continuation of the intervention: 85% approval	~90%–110%

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Anderson et al. (1983)	Checklist, feedback, and token economy	(a) Involvement in intervention design and (b) use of instructional design factors	(a) Staff were invited to share viewpoints regarding the methods of the project, and (b) staff repeated practice to fluency	1 week	Weekly average	4 weeks	N/A	~100%–115%
Anderson et al. (1983)	Checklist, feedback, and token economy	Sequential modification	Checklist was tested and revised	1 week	Weekly average	3 weeks	N/A	~95%–110%
Clayton & Blaskewicz (2012)	Prompts and task clarification	Intervene and hope	Signs remained posted with no additional steps to promote generality	4 months	Daily	5 days	N/A	117% and 72% (across settings)
Clayton et al. (2014)	Verbal prompt and reinforcement	Intervene and hope	No further steps to promote generality	2 months	Five observations	1 week	N/A	15%
Coles & Blunden (1981)	Activity period	(a) Involvement in intervention design and (b) training internal staff	(a) Slight modifications to the program based on trials and interactions with staff, and (b) staff trained to conduct the intervention	1 week	Twice per week	6 months	N/A	46% (high variability)

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Coles & Blunden (1981)	Altered the activity period to include feedback to staff, a hierarchical reporting system, and a multidisciplinary management group	Sequential modification	Modified the previous intervention to support maintenance of behavior change	30 days	Daily	5 days	N/A	149%
Craig & Leland (1983)	Environmental manipulations (more disposal areas) and prompts	Intervene and hope	Disposal areas and posters remained available following termination of experimenter	7 weeks and 14 weeks	Two weekly averages	2 weeks	N/A	77%–102%
Culig et al. (2008)	Ergonomic changes, information, feedback, and praise	Use of instructional design factors	Participants were required to demonstrate mastery of positions	4 months	Once per month	Once for four participants and 6 months for three participants	N/A	40%–105% (high variability across participants)
Deluga & Andrews (1985)	Incentive system and training	Intervene and hope	No further steps to promote generality	2 months	Average of 1 week of data	1 week	N/A	230%, 150%, and 90% (three DVs)

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Doucette et al. (2012)	Prompt (posted schedule)	Mediate generalization	Participants were told by supervisors that the completion of certain tasks was required to receive salary increases	6 weeks, 6 months, and 1 year	Three weekly averages	3 weeks	Participants rated the intervention as highly accepted	100%
Durgin et al. (2014)	Training and job aid	(a) Training internal staff and (b) use of instructional design factors	(a) Supervisors were trained to evaluate and provide feedback on trainer's performance, and (b) supervisors received immediate feedback and were required to master the calculation of scores	Two types of follow-up: (a) approximately 1 week following the independent supervision phase and (b) immediately following the intervention	(a) One or two sessions and (b) one or two sessions	One or two sessions	High treatment acceptability among supervisors and employees	first follow-up: 104%, 106%, and 110%; second follow-up: 136%, 141%, and 150%
Elder et al. (1984)	Training and group meetings	(a) Use of instructional design factors and (b) involvement in intervention design	(a) Repeated training and modeling of performance, and (b) staff assisted in the development of the procedures	6 months	Weekly	6 weeks	N/A	71% and 200% (across settings)
Evans et al. (1988)	Lottery incentive system	Intervene and hope	No further steps to promote generality	Immediate	Daily	2 weeks	N/A	51%

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Fanslow et al. (1988)	Signs and prompts	Intervene and hope	Placed signs and prompts in designated areas with no additional steps to promote generality	2.5 weeks	Three observations	1 day	N/A	89%
Gaetani et al. (1983)	Feedback	Intervene and hope	No further steps to promote generality	3 months and 6 months	Daily	2 days	N/A	100%
Geller et al. (1983)	Incentives	Use of indiscriminable contingencies	Free dinners for those wearing a seatbelt	2 weeks	Daily	13 days	N/A	63% and 37%
Godat & Brigham (1999)	Training	Intervene and hope	No further steps to promote generality following the training session	Immediate (attendance rates) and 1 month (questionnaire)	1 month of data and one questionnaire	1 month	The training program helped to improve performance management and work-related problems	98%
Godbey & White (1993)	Monitoring, objectives, feedback, and praise	Sequential modification	The intervention was reinstated after a withdrawal but modified slightly based on previous audit	6 months	Once	1 month of data	N/A	108%

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Gravina et al. (2008)	Task clarification, feedback, and environmental manipulations	(a) Training internal staff and (b) behavioral systems analysis	(a) Supervisors were trained to conduct observations and provide feedback, and (b) supervisors used the Performance Diagnostic Checklist to assess intervention components	3 months	Once	One observation	Participants favored graphic feedback	66% and 83.3% (across groups)
Green et al. (2008)	Participative management process, lottery system, and rewards	(a) Promotion of social validity and (b) training internal staff	Conducted a preference assessment and trained supervisors on behavioral procedures	12 weeks (first participant) and 13 weeks (second participant)	Weekly	One measure	Participants were satisfied with the intervention	100% and 116% (across participants)
Haberlin et al. (2012)	Training	(a) Training internal staff and (b) use of instructional design factors	(a) Management was trained to deliver training, and (b) training included role play	3 months	One measure	1 day	Participants reported the training as useful	~102% and 75% (across DVs)
Hanel et al. (1983)	Manual on time management and workshop	Promotion of social validity	Multiple social validity measures were taken	4 weeks	Weekly average	1 week	Participants found the manual to be helpful and relevant	90%, 53%, and 77% (three groups)

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Hanel et al. (1983)	Manual on time management and workshop (no instructor contact)	Promotion of social validity	Multiple social validity measures were taken	3 weeks	Weekly average	1 week	Participants found the manual to be helpful and relevant	96% and 102% (two groups)
Hantula et al. (1993)	Prompts and mass media campaign	Intervene and hope	No further steps to promote generality	2 weeks, 3 weeks, and 2 months	Daily	3-day periods	N/A	~70% and ~105% (across DVs)
Jamison et al. (2014)	Training and overt response requirements (presence or absence) on computer-based training performance	Use of instructional design factors	Overt response requirements and response feedback	1 week	One test	One test	N/A	96%, 92%, 98%, and 102% (across participants)
C. M. Johnson (1985)	Feedback and incentives	Intervene and hope	No further steps to promote generality	1 month	Daily	7 days	N/A	93%, 103%, 108%, and 108% (across settings)
C. M. Johnson & Masotti (1990)	Goal setting, rewards, praise, and feedback	Involvement in intervention design	Staff helped to determine performance goals	3 weeks and 12 weeks	Weekly averages	2 weeks	N/A	89% and 64%; 42% and 44%; 25% and 50% (two follow-up measures across three DVs)

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Johnston & Hayes (2005) (Experiment 2)	Training, goal setting, and feedback	Intervene and hope	No further steps to promote generality	Did not specify	300 trials	1 day	N/A	90% and 209% (across groups)
Jones et al. (1985)	Training and feedback package	Intervene and hope	No further steps to promote generality	1 week	Monthly averages	6 months	N/A	100%, 111%, and 109% (across DVs)
Kopelman & Schneller (1981)	Mixed consequence (employee pay procedure)	Intervene and hope	No further steps to promote generality	Immediate	Annual averages	2.5 years	53% of employees were satisfied with the pay change	338%
Lamal & Benfield (1978)	Daily self-recording sheets (self-monitoring)	Mediate generalization	Coworker informed the subject that the number of hours spent working is very important and that it is required by the company to work 8 hr each day	11 weeks	Four measurements	3–4 days	N/A	104% and 96% (across DVs)
Langeland et al. (1997)	Training, goal setting, feedback, and praise	(a) Promotion of social validity and (b) mediate generalization	(a) Follow-up meeting in which participants discussed the intervention and any questions/problems with the intervention, and (b) job descriptions were used as rules of performance	2 weeks	2, 4, and 6 weeks *and* 1, 2, and 4 years (six measures)	Each was 1 week in length	Participants and parents were extremely satisfied with the intervention	98%, 102%, and 102% (across DVs)

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Loughrey et al. (2013)	Video modeling, role play, visual prompts, and feedback	(a) Use of instructional design factors and (b) training internal staff	(a) Participants were required to demonstrate mastery, and (b) supervisors were trained to deliver feedback	2 weeks	Once	One session	The intervention was rated by participants as satisfactory and useful	101% and 93% (across participants)
Ludwig & Geller (1999)	Prompts	Intervene and hope	No further steps to promote generality	Approximately 1 month	At least nine observations per day	5 months (2,440 observations)	More than 50% of participants reported that they would use their seatbelt with program in place	96%
Ludwig & Geller (2000)	Group discussions, promise cards, and prompts	Intervene and hope	No further steps to promote generality	3–4 weeks	Weekly average	3 months	N/A	101% and 59% (across settings)
Ludwig & Geller (2000)	Group goal setting and group feedback	Involvement in intervention design	One group of participants was involved in setting performance goals	5–6 weeks	Weekly average	9–10 weeks	N/A	88% and 72% (across settings)
Ludwig & Geller (2000)	Group goal setting and group feedback (included individual performance data)	Involvement in intervention design	Employees voted on the group performance goal	5.5 weeks	Weekly average	8 weeks	N/A	65% and 61% (across groups)

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Ludwig & Geller (2000)	Rewards and feedback	Involvement in intervention design	Participants determined the rewards	1 week	Weekly average	2–3 weeks	N/A	91% and 67% (across settings)
Ludwig & Geller (2000)	Individual goal setting and feedback	Intervene and hope	No further steps to promote generality	1 week	Weekly average	4 weeks	N/A	116%, 91%, and 62% (across groups)
McCuddy & Griggs (1984)	Goal setting and feedback	Involvement in intervention design	Employees participated in goal setting, and managers conducted all employee meetings/reviews	Did not specify	Not specified	Approximately 1 year	N/A	Informal reports from management suggest continued success

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Myers et al. (2010)	Training, feedback, and social recognition	(a) Involvement in intervention design, (b) training internal staff, (c) use of indiscriminable contingencies, and (d) sequential modification	(a/b) Certain employees participated in committees in which they worked with the consultants to develop the intervention and helped train other employees, (c) employees were told that they would be periodically observed by coworkers and management, and (d) the reward program was altered following the pilot implementation	Immediate	Annual	Approximately 9 years	N/A	~115%–210% (some variability)
Nordstrom et al. (1988)	Goal setting, feedback, and incentives	Intervene and hope	No further steps to promote generality	1 year	Four to seven observations per day	75 observations	N/A	~40% and ~60% (across groups)
Nordstrom et al. (1988)	Feedback	Intervene and hope	No further steps to promote generality	1 year	Did not specify	2 weeks	N/A	26% and 53% (across groups)
Nordstrom et al. (1988)	Group and individual incentives	Intervene and hope	No further steps to promote generality	1 year	Every 2 weeks	18 weeks	N/A	77%

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Porterfield et al. (1985)	Various procedures to increase staff organization, staff–family communication, and clients' recreational activities	(a) Involvement in intervention design and (b) formal data collection system	(a) Staff and client families determined the target behaviors, and (b) senior staff conducted observations and provided feedback to coworkers	14 weeks	Daily	1 week	Staff were satisfied with the changes, and clients' families reported a positive change in staff behavior	99%
Ralis & O'Brien (1987)	Prompts, goal setting, feedback, and praise	Involvement in intervention design	Staff helped to determine performance goals	6 weeks	Weekly averages	2 months	N/A	90% and 38% (across DVs)
Rohlman et al. (2004)	Training	Use of instructional design factors	Utilized various instructional design techniques (repeated testing, overt response requirements, and repeated exposure to correct answer)	1 week and 1 month	Two tests	Two tests	N/A	85% (1 week) and 79% (1 month)
Rose & Ludwig (2009)	Task clarification, self-monitoring, and performance feedback	(a) Training internal staff and (b) behavioral systems analysis	(a) Management and employees were trained on the checklist, and (b) use of a PIC/NIC analysis	6 weeks	Daily	3 weeks	N/A	58%

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Runnion et al. (1978)	Feedback and reinforcement system	Training internal staff	Trained management to provide feedback	4 weeks	Weekly averages	4 weeks	N/A	98%
Sasson & Austin (2005)	Training, feedback, and employee observations	(a) Use of instructional design factors and (b) formal data collection system	(a) Participants were required to demonstrate mastery and meet criterion levels, and (b) participants were tasked with observing and collecting data on coworker performance	4 months	Three or four sessions (depending on participant)	Three or four sessions	Participants were satisfied with the intervention	~105%
Silva et al. (1981)	Feedback and praise	Training internal staff	Management was trained to plot attendance and later trained in the theory and use of social reinforcement	Immediate	Daily average	12 days	N/A	104%

(Continued)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Slowiak (2014)	Task clarification, goal setting, feedback, and rewards	Involvement in intervention design	Participants completed a reinforcer assessment	Two types: (a) immediate and (b) 5 months	(a) Once weekly and (b) one session	(a) 7 weeks and (b) one session	This information was not available to researchers	Correct greeting components: (a) 94% and (b) 82%; friendly tone: (a) 91% and (b) 108%; abandon rate: (a) 86% and (b) 135%
Stephens & Ludwig (2005)	Training, goal setting, and feedback	Involvement in intervention design	Nurses participated in setting performance goals	5 weeks	Five to eight observations over 3 weeks	3 weeks	The nurses reported high levels of satisfaction and they reported that environmental factors may have been confounds	~116%–155%
Streff et al. (1993)	Group meeting and personal commitment (promise card)	Intervene and hope	No further steps to promote generality	1 month and 2 months	Four observations (1-month follow-up) and three observations (2-month follow-up)	381 and 341 (safety glasses) observations and 442 and 205 (seatbelt) observations	N/A	Two follow-up periods: 87% and 95% (first DV) and 36% and 49% (second DV)

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Szabo et al. (2012)	Performance scorecards, training, team meetings, and reinforcement	Training internal staff	Supervisors were trained to implement the intervention components	3 months, 6 months, and 12 months	Monthly	Three probes	(a) Supervisors were satisfied with training, (b) clients were satisfied after 2 years of clinical consultation services, and (c) stakeholders were satisfied	99%
Thurkow et al. (2000)	Monetary incentives	Intervene and hope	No further steps to promote generality	2 months	Daily	2 days	80% preferred individual incentives	~110%
Wikoff et al. (1983)	Feedback and feedback plus praise	(a) Training internal staff and (b) involvement in intervention design	(a) Supervisors were coached to contact and praise employees, and (b) selected participants were interviewed to develop the rating instrument	Immediate	Weekly	8 weeks	N/A	~90%–105%

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Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Wilk & Redmon (1997)	Feedback and goal setting	(a) Involvement in intervention design, (b) training internal staff, and (c) use of instructional design factors	(a) An employee assessment of workplace problems was used to develop the intervention, (b) supervisors were trained on behavioral techniques, and (c) supervisors were required to demonstrate mastery of the material	Approximately 30 weeks	Every 4–6 weeks	1 week	Participants were satisfied with the intervention	112%, 115%, 97%, and 105% (across DVs)
Wilson et al. (1997)	Training and feedback	(a) Training internal staff and (b) sequential modification	(a) Supervisors were trained to provide feedback to staff; and (b) supervisors were experiencing practical problems with performance monitoring, so the intervention was altered	6 weeks	Daily	3 weeks	N/A	68%, 116%, 92%, and 98% (across participants)
Wittkopp et al. (1991)	Training, job aids, praise, and feedback (feedback package)	Training internal staff	Trained supervisors to conduct audits	Immediate	Weekly	10–15 weeks	N/A	~90%, ~102%, ~101%, and ~98% (across participants)

(*Continued*)

Table 2. (Continued).

Author(s)	Intervention	Temporal generality tactic(s)	Components of tactic(s)	Elapsed time between experimenter involvement and follow-up	Frequency of follow-up data collection	Duration of follow-up data collection	Form of social validity and findings	Percentage of behavior change generality
Zohar & Fussfeld (1981)	Token economy	(a) Involvement in intervention design and (b) formal system of dispensing consequences	(a) Internal staff participated in the development of the token system, and (b) continued supervisor praise and other reinforcement following termination of token system	Immediate and 6 months	Twice per week	12 weeks (immediate) and 4 weeks (6 month)	N/A	~100% (first follow-up) and 51% (second follow-up)

Note. N/A = not applicable (article did not report any form of social validity measures); DV = dependent variable.

independently reviewed, and IOA was 94.6%. For both stages, IOA was calculated by using the number of agreements divided by the number of agreements plus disagreements. The disagreements were then analyzed and discussed between both reviewers until an agreement was reached.

Categories and definitions

Intervention
All intervention components were classified exactly as described by the original article's author. If the study involved a multicomponent intervention, then all components of the intervention were recorded.

Temporal generality tactic
Articles were classified as including one or more of the following tactics: (a) intervene and hope, (b) sequential modification, (c) introduce to natural maintaining contingencies, (d) use of indiscriminable contingencies, (e) mediate generalization, (f) behavioral systems analysis, (g) promotion of social validity, (h) use of instructional design factors, (i) involvement in intervention design, (j) training internal staff, (k) formal data collection system, or (l) formal system of dispensing consequences. We coded articles based on the descriptions provided by Stokes and Baer (1977) and Sigurdsson and Austin (2006) as well as the information provided in the introduction of this article. If a study incorporated more than one temporal generality tactic, multiple tactics were recorded. Furthermore, only those tactics with a direct influence were recorded as such. For example, if a study reported training internal staff or incorporating social validity information, it was not recorded as involvement in intervention design because this tactic specifically refers to direct involvement in the intervention design.

Components of tactics
The specific component(s) of each generality tactic were also recorded. For example, if the use of instructional design factors was listed as a tactic, the specific components of that tactic were recorded (e.g., trained to mastery, incorporation of fluency training, repeated testing).

Elapsed time between experimenter involvement and follow-up
The total amount of time that passed between the last data point involving active intervention by the experimenter and the first data point of the follow-up phase was recorded. If follow-up data collection began immediately following the experimenter's termination, the elapsed time between experimenter involvement and follow-up was recorded as "immediate." If the author(s) reported multiple follow-up probes, each time period was recorded.

Frequency of follow-up data collection

The frequency of follow-up data collection was recorded as the average rate of data collection throughout the follow-up period. For example, if follow-up data were collected every Monday throughout the follow-up period, the frequency of follow-up data collection was recorded as weekly. Furthermore, if several dependent variables were recorded at different frequencies throughout the follow-up period, multiple frequencies were recorded. For example, if two dependent variables were both measured weekly, a weekly frequency of data collection was recorded for both. However, if one dependent variable was collected daily and the other was collected weekly, both daily and weekly frequencies were recorded.

Duration of follow-up data collection

The total amount of time that elapsed between the first data point and the last data point of the follow-up period was also recorded.

Form of social validity and findings

Details on social validity measures were also documented for each of the studies. If an article did not report any form of social validity measures, the category was labeled "N/A." If a study included social validity measures, the findings are reported exactly as described by the article's author.

Percentage of behavior change generality

The total amount of behavior change that occurred between the intervention phase and follow-up phase was recorded as a percentage. The reviewers determined the percentage of change by comparing the average performance for the intervention period(s) to the average performance for the follow-up period. In studies that did not report statistical comparisons of follow-up performance to intervention performance, the reviewing author relied on graphical representations of the data as well as the written judgements of the author(s). In such cases, a tilde was used to indicate a judgement by the author(s). If an article reported a range of scores, the average of that range was recorded as the total performance change. If multiple follow-up periods, dependent variables, settings, groups, or participants were reported, each percentage was recorded separately.

Results

Generality tactics

As seen in Figure 1, the most common tactic for promoting generalization among the 63 studies reviewed was to intervene and hope (21 studies). Following this popular tactic was involvement in intervention design (17
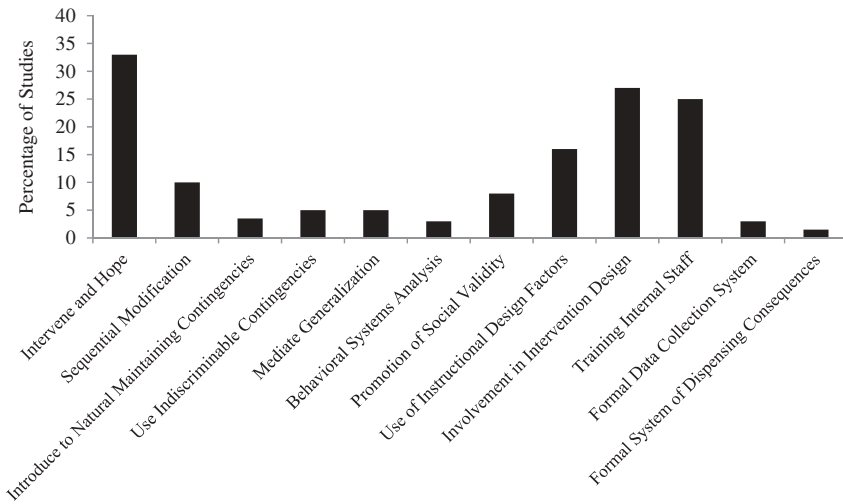
Figure 1. Percentage of temporal generality tactics reported in the *Journal of Organizational Behavior Management*.

studies) and training internal staff (16 studies). Lesser utilized generality tactics were the use of instructional design factors (10 studies), sequential modification (six studies), promotion of social validity (five studies), the use of indiscriminable contingencies (three studies), mediate generalization (three studies), behavioral systems analysis (two studies), formal data collection system (two studies), and formal system of dispensing consequences (one study). The introduce to natural maintaining contingencies tactic was not utilized by any of the studies reviewed. Of the 63 studies reviewed, 45 included only one generality tactic, whereas 15 studies incorporated two generality tactics. Far less common was the combination of three tactics (one study) or four (two studies).

Comparison of intervention types

In the 63 studies analyzed for follow-up data, intervention type was recorded exactly as presented by the article's author. Of the 63 studies, 33 (52.3%) included feedback, either in isolation or in combination. Training was an intervention component for 19 (30.1%) of the 63 studies, whereas incentive systems were an intervention component for 13 (20.6%) of the total studies. Lesser utilized interventions were goal setting (19.0%), prompts (15.8%), praise (12.6%), reinforcement/rewards (11.1%), task clarification (9.5%), job aids/checklist (9.5%), group meetings (6.3%), environmental manipulations (6.3%), self-monitoring (3.1%), promise cards (3.1%), performance monitoring (3.1%), activity periods (3.1%), social recognition (1.5%), performance

scorecards (1.5%), multidisciplinary management group (1.5%), announcements/mass media campaign (1.5%), and various procedures (1.5%).

Duration of data collection

The average duration of follow-up data collection was 4.03 weeks (28.2 days) for 48 of the 63 studies. In 12 of the 63 studies, the duration of follow-up data collection was not included in the average because the authors of these studies did not report the follow-up period in days, weeks, months, or years. Those durations omitted from the average were reports of three probes, one or two sessions, one measure (six studies), 75 observations, two tests, three or four sessions, 205–381 observations, approximately 1 year, approximately 9 years, and 2.5 years. Furthermore, if the duration of follow-up data collection exceeded 1 year, the duration was not included in the average. This was done because only a few studies exceeded 1 year, but those outliers had extreme values that greatly skewed the average numbers. These outliers were from three studies in which one author reported follow-up data collection for approximately 1 year, another for 2.5 years, and the most extreme for approximately 9 years. The most common durations of follow-up data collection were 1 week and 2 weeks (four studies), and the range of follow-up data collection spanned from 1 day to approximately 9 years.

Elapsed time between experimenter involvement and follow-up data collection

The average elapsed time from the termination of the experimenter's involvement to the follow-up period was approximately 5.1 weeks (36.1 days). In 16 of the 63 studies, the elapsed time was not included in the average because the author did not report the time period in hours, days, weeks, months, or years. Furthermore, if the author reported a time period greater than 30 weeks, the duration was not included in the average. Those omitted had time periods of immediately (10 studies), did not specify (two studies), 1 year (three studies), and 30 weeks (one study). If the aforementioned studies are included in the average, the average elapsed time increases to 8.1 weeks (56.8 days). The most frequently reported time period was 1 week (seven studies), and the range of elapsed time was immediately to 2 years. It should be noted that if a study included more than one follow-up period, only the elapsed time to the first follow-up period was included in the average.

Frequency of follow-up data collection

The most commonly reported frequency of follow-up data collection was weekly, with 21 studies (33.3%) reporting this frequency. Daily data

collection (12 studies) and a single follow-up measure (six studies) were the next most common frequencies of follow-up data collection. Less commonly reported frequencies were monthly (four studies), annually (two studies), twice per week (two studies), nine per day (one study), four to seven per day (one study), every 4–6 weeks (one study), and every 2 weeks (one study). There were a total of 11 studies for which the author did not report the frequency of data collection in specific units of time. Rather, the data were reported in terms of sessions, observations, trials, measurements, or tests without any indication of the amount of time passing between data points.

Form of social validity and findings

In the 63 studies reviewed for follow-up data, 20 of the studies (approximately 31.7%) included some sort of social validity measure. The most commonly utilized social validity measure was a participant/staff survey, with 15 of the 20 studies reporting this measure. The next most common social validity measure was a customer/client survey (four studies) followed by a supervisor survey (one study). All of the authors who reported using social validity measures stated that the findings revealed satisfaction with the intervention.

Percentage of performance change

In the 63 studies reviewed for follow-up data, a total of 127 performance measurements were reported (across participants, settings, groups, or dependent variables). Of the 127 performance scores, 45 measures (35.4%) reported a performance change of 101% or higher. With a total of 30 measures, the next most frequently reported percentage of performance change was 61%–90%, followed closely by 91%–100% with 29 measures. The next most common percentage of performance change was 31%–60% with 18 measures. Lastly, only two measures reported a performance change of 0%–30%.

Discussion

The results of this review suggest that temporal generalization was frequently planned for or at least assessed in many of the studies reported in *JOBM* between 1977 and 2014. Of the 311 articles reviewed, 53 included some form of follow-up data. Given that many laboratory studies were omitted because institutionalization is not always possible outside the context of an organization (although generalization in the form of maintenance could still be assessed), the substantial portion of articles collecting follow-up data is encouraging. The results of this study also indicate notable improvements in the percentage of performance change for those studies reporting follow-

up data. It is important to note that the percentage of performance change is one of the most important aspects of this review, given that such changes are representative of longevity. These improvements suggest that those OBM practitioners and researchers planning for generalization of behavior change are successful in their goal of maintaining and increasing performance improvements. Nevertheless, based on the findings of this review, it seems warranted to recommend that OBM researchers and practitioners continue to plan for generalization if the goal of the intervention is to attain lasting performance improvements.

The majority of studies reporting the collection of follow-up data were classified as utilizing the generality tactic of intervene and hope. As previously mentioned, studies falling within this classification simply assessed the levels of targeted performance following the withdrawal of direct consultant/researcher services without an explicit strategy to improve the durability of changes. Although it is laudable that follow-up measures are being collected, there is clearly much potential for a more extensive approach to maximizing the value of the average intervention. This absence of a comprehensive approach can also be shown by the infrequency of temporal generality tactic combinations (i.e., including more than one generality tactic). To be fair, there is a possibility that the use of more than one generality tactic is not worth the additional resources, and additional tactics are not necessary for successful performance change. It is also possible that some generality tactics may conflict with one another or that certain packages of generality tactics may be redundant. Nevertheless, these are empirical questions that have not been answered. It is just as likely that the reason is simply neglect and that the OBM community has not done enough as a field to truly understand the utility of generality tactics. Given this finding, further investigation of generality tactics and combinations thereof may be worthwhile in understanding the most effective methods of promoting generalization.

On a related note, the results of this study indicate that certain generality tactics have never been or are rarely assessed. For example, behavioral systems analysis, formal data collection system, formal system of dispensing consequences, and introduce to natural maintaining contingencies were rarely utilized in the published *JOBM* articles reviewed. Some possible reasons for the lack of some generality tactics relate to the cost and time required to use these tactics. This is of particular concern with the behavioral systems analysis tactic, as this particular tactic is labor intensive and may not be necessary for further behavior change. As for the formal data collection system and formal system of dispensing consequences tactics, time and resources may also be a potential barrier to their use. Lastly, nearly all, if not all, OBM interventions are used with verbally sophisticated adults, and as a result it may not be necessary to gradually expose them to natural maintaining contingencies. Instead of slowly shaping the performer's behavior

through direct contingencies, intervention specialists could simply communicate the consequences for the targeted behavior and then allow the contingencies underlying rule-governed behavior to immediately promote behavior change.

Unfortunately, we currently do not have the research to fully explain the reasoning behind the implementation of some tactics and the absence of others. Until we conduct empirical research to better understand the effects of certain generality tactic combinations and the effectiveness of various tactics, we will continue to use these strategies ignorant of their potential effects. In accordance with this statement, the present review found no studies that used a control group to compare the effects of different generality tactics or generality tactic combinations. As with any treatment, it is necessary to conduct comparative research to discover the optimal use of intervention strategies, but again there has never been a comparative study on temporal generality in OBM research. Until such empirical evidence is collected, the field of OBM will remain blind to the impact of certain generality tactics with certain types of tasks or interventions. For example, it may be the case that the training internal staff and involvement in intervention design tactics is the most effective combination for maintaining performance with feedback interventions. If this were the case, would incentive packages then see the same amount of success with this combination? At this point in time, most researchers are simply implementing an intervention with only one or two generality tactics and hoping for the best. In order for OBM to maintain and further grow its reputation for generating lasting behavior change, it is important for the field to investigate the temporal generality tactics that will promote such behavior change over an extended period of time.

The findings of this review also indicate a clear deficiency of social validity measures in the OBM literature. Because social validity measures are a means of assessing intervention acceptability and significance of results, such measures are key for the lasting effects of any intervention. As previously mentioned, social validity measures may provide information regarding conditions to promote the temporal generality of intervention effects within an organization. In other words, this information may be used to determine the environment and social context that will most likely foster these new behaviors. If there is buy-in among those responsible for carrying out the intervention following the removal of the intervention specialist, there is a much greater chance of success following the termination of the researcher or consultant. Given this, information on social validity should be an integral part of designing any intervention to maintain successful performance change. Considering the lack of current understanding of temporal generality tactics, combinations of tactics, effect on various dependent variables, and

effect on social validity, there is too much that researchers do not know about something so important to the field. This is not a criticism of previous research, nor is it invalidation of OBM interventions, but this is certainly an area of research that warrants greater attention.

The short duration of follow-up periods frequently reported by authors is also worth mentioning. Again, the average duration of the follow-up period was approximately 4.03 weeks, with 1 and 2 weeks being the most frequently reported durations. Considering the significant amount of time researchers spend collecting baseline and experimental data, follow-up data collection seems to be lacking attention. Most researchers spend a significant amount of time on baseline and experimental phases while neglecting possibly one of the most important phases of the project. Although the collection of follow-up data is an arduous task and competes with the timely demands of graduation, tenure, supervision, and new clients, the durability of performance change remains an issue for organizations. Because an intervention's lasting effect is likely a primary concern for those within any organization, there remains a potential conflict of priorities between the intervention specialist and the organization. Given the high pressure for researchers, particularly those in academia, to publish frequently rather than spend excessive time collecting data for a single publication, the primary goals of the researcher are often in conflict with the goals of the organization.

This issue brings about the practical obstacle in determining how researchers can arrange support for such time-intensive projects. Again, many researchers are subject to publication demands that do not easily allow for lengthy follow-up periods. Many graduate students are also under pressure to meet graduation deadlines and therefore avoid those projects that require a lengthy time demand or simply neglect follow-up data collection altogether. Furthermore, once students leave the institution where they are collecting research data and go on to get a job, there is little incentive to follow up with the project. Although these obstacles will likely remain challenges in the future, there are some possible ways to encourage more research that could demonstrate temporal generality. For example, many consulting firms develop long-term relations with clients that may provide an opportunity to examine temporal generality strategies. Most consultants are not under strong pressures to publish frequently and therefore can afford a more extensive time period for data collection, although this brings up the challenge of creating incentives for consultants to publish at all. Perhaps collaborative efforts between academics and practitioners could surmount this challenge created by the needs and opportunities related to the publication of time-extensive research, because consultants are more motivated to foster long-term client relations and academics are more motivated to publish accounts

of these relations. Alternatively, perhaps publication outlets could encourage the submission of secondary articles focused solely on follow-up. That is, years after an original primary study is published, a secondary study could be published examining whether the effects found in the primary study were maintained or institutionalized by the organization. Even if performance change did not endure across time, the secondary study could be quite valuable if it detailed the reasons why the intervention failed in the long run. Such lessons learned would provide an opportunity for the development or refinement of temporal generality strategies in order to foster more effective interventions in the future.

One possible limitation of the current review is that it does not report all of the possible mechanisms used to sustain changes, as we were limited to publicly accessible resources. For example, some consulting firms may have developed strategies for promoting generalization, and there may be more extensive in-house knowledge on how to foster temporal generality; however, by their nature as trade secrets they are not publically known. This review may consequently undersample the known knowledge on the topic. Furthermore, consultants are typically brought into an organization by top management, and thus it is management who supports, mandates, and typically follows up on implementation following the removal of the consultant. This approach includes both formal and informal social and nonsocial consequences, so it does not quite fit with any of the tactics described in this article. Although this approach may be considered a part of the formal system of dispensing consequences tactic, it does not fully account for this strategy by top management. Despite these limitations, it is important to note that this was the most representative sample that we had access to, and *JOBM* is the best outlet for the current review.

There may be additional strategies for promoting temporal generality that are not highlighted in this review. For example, the difficulty of the intervention will likely have an impact on whether maintenance of behavior change is achieved. Furthermore, there may be internal workers who champion the intervention and help maintain it, which is likely an important factor in achieving temporal generality. Lastly, leader support is often a very important factor in the long-term maintenance of interventions. None of the strategies outlined in this article addressed these tactics.

The generality tactics outlined in this review may serve as a roadmap for future research as well as provide inspiration for consultation. The potential of the 12 tactics for improving the durability of performance change over time has not been well investigated. This represents a rich source of research studies on the relative effectiveness of each of these tactics, both in isolation and in various combinations. These tactics also

offer conceptually sound guidelines for consultants looking to extend the reach of the interventions and services they are already offering to clients. Given the clear importance of maintaining performance change over time, those concerned with the growth of OBM and OBM interventions should be interested in determining the most effective means of maintaining this performance change. This represents a potentially important advancement in building this science and selling its services to the world at large.

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Asterisks indicate works included in the meta-analysis.

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