Facilitating high quality idea evaluation using telescoping

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Abstract

Research studies of group creativity and innovation commonly utilize the traditional two-step diverging (ideation)-converging (evaluation) thinking process (Baer, 2003), and has focused mostly on the divergence step using the tool of brainstorming to generate ideas to solve problems. Relatively little attention has been given to the convergence step, in particular to improving group performance in the evaluation step and understanding its role in yielding high quality creative solutions. In this study, we propose that while the evaluation step is fundamental for making judgments and for the selection of ideas and options, when performed skillfully it can contribute much more to the creative process. These contributions include significantly improving the quality of the ideas being evaluated while they are being evaluated, creating emergent new and different ideas, and building informed consensus. A hands-on, effective, research-based cognitive evaluation tool called "telescoping" which offers the capability of evolving optimal decisions without sacrificing high levels of consensus is introduced. The decision making literature abounds with well known obstacles which prevent groups from achieving this combination. How skillful execution of telescoping addresses these obstacles is shared. Field research is reported that supports the superiority of telescoping versus majority vote in real world idea evaluation.

Keywords: creativity; creative problem solving; brainstorming; idea evaluation; decision making; consensus decisions; group problem solving.

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Zusammenfassung

Schlüsselwörter:

Introduction

Research into group creativity and innovation commonly utilizes the traditional two-step, diverging thinking (ideation)-converging thinking (evaluation) process or at the very least recognizes that group creativity involves the creation of options and the subsequent selection of the best options (Baer, 2003). The tool employed for the ideation step is typically brainstorming (Osborn, 1953). In brainstorming, no criticism of ideas is permitted, quantity is sought, and participants are urged to strive for a high quantity of ideas, building on others' ideas, and deliberately thinking up "wild" (highly unusual) ideas to spur more ideas. The vast majority of research into creativity has focused on understanding and improving the quality of the diverging step of the process with relatively little attention paid to understanding and improving the quality of the converging step (Baer, 2003; Basadur & Gelade, 2005; Runco, 2003). This lopsided focus on divergent thinking has unfortunately served to obscure the fact that the converging (evaluative) step is equally important in most creativity theories, and that the two are "inextricably linked… the more we diverge, the more effort we must put into converging (Baer, 2003, p. 132)."

This is not to say, however, that no research has been conducted on the converging step of the traditional process. For example, studies have shown evidence that skills in diverging thinking and skills in converging thinking may be related to one another even though ideational and evaluative processes are opposite concepts. Studies have found positive correlations between diverging thinking skills and evaluative thinking skills with the implication that individuals who generate more ideas have more success in evaluating them (Runco, 1991; Runco & Smith, 1992; Runco & Vega, 1990; Runco & Basadur, 1993; Basadur, Runco & Vega, 2000). It has been suggested that a contributing factor to this finding might be that skilful divergence is a form of information-sharing without judgment, as group members feel free to share even their wildest ideas, and the active listening that results by fellow group members ensures that ideas are understood in the context in which they are contributed. Thus the quality of the subsequent evaluation work may be enhanced by such increased understanding (Runco, 2003).

This gap in creativity research has been identified by decision making researchers who have published a growing number of research articles claiming that idea generation (brainstorming) can be improved through the introduction of criticism during the diverging phase of the two-step process, either in terms of changing the "no criticism" rule in brainstorming, or through the utilization of devil's advocacy or minority dissent, and others (DeDreu & West, 2001; Greitemeyer et al., 2006; Nemeth et al., 2004; Nemeth & Nemeth-Brown, 2003; Rietzschel, Nijstad & Stroebe, 2006). These efforts attempt to improve group creative performance by tinkering with the diverging thinking step of the two-step process. To our knowledge, none have examined how group creative performance might be improved by tinkering with the evaluative thinking step of the two-step process.

The primary purpose of this paper is to introduce a methodology, called telescoping, which enables groups to more skillfully evaluate the solution ideas which they have generated to a problem requiring creativity. We believe that while evaluative thinking is the judgment and selection of options and ideas, the evaluation step has the potential to be greatly improved and to also contribute much more to the creative process than the simple selection from among options. Performed skillfully, it can significantly improve the quality of the ideas being evaluated while they are being evaluated and often even create emergent new ideas. Our view is quite different from those suggesting that the two-step diverging-converging process be improved by changing the initial (diverging) step. We argue the exact opposite, that it is the second (converging) step of the process that if improved offers the greater opportunity to positively impact group brainstorming performance.

A second purpose is to use the research on convergence and our field experience to begin to create a bridge between the group decision making literature and the creativity (or creative problem solving) literature. In essence, we are attempting to build greater understanding, and perhaps even more so, to reduce misunderstanding, of a simple creative problem solving theory, that is, the traditional two-step idea generation-idea evaluation process (Baer, 2003). Two key components of this theory are, first, that skills in executing this process are necessary and part and parcel of the process itself, whether the skills reside in group members trained in the creative process, or in an expert process facilitator, or ideally in both. The second key component is that the evaluation step requires a tool and skill equally as powerful as the brainstorming tool and skill are to the ideation step. This paper presents an empirical study of the impact of skilled facilitation of the two-step process, utilizing the telescoping method in the converging step, on the evaluative performance of solution teams as compared to the utilization of a majority vote converging procedure.

We believe that this increased understanding provides an important contribution to the fields of creativity and decision making research by addressing the glaring need for research into the idea evaluation step of the process, one that also addresses many of the problems and concerns about group creative performance raised in the decision making literature.

Background

Osborn (1953) introduced the idea of separating the creation of ideas from the evaluation of ideas employing the deferral of judgment principle, (with

the brainstorming tool used to enhance idea creation) and thus offered a simple theory in the form of a two step process for solving problems termed "ideation-evaluation" (Basadur, Graen & Green, 1982). Osborn and colleagues promoted training for individuals and groups and further research in the process (e.g., Parnes, Noller & Biondi, 1977). Thus Osborn pioneered the field of creative problem solving which began with applying the two step process to presented, already defined problems and now has evolved toward being increasingly often modeled as a more complex, multi-phase process comprised of a sequencing of the two step diverging and converging (ideation-evaluation) activity from phase to phase (cf. Baer, 2003; Kabanoff & Rossiter, 1994; Basadur et al., 1982). For example, a simple three-phase creative problem solving model would sequence the two step ideation-evaluation process through the three phases of problem finding, solution finding and solution implementation (Basadur et al., 1982; Lubart, 2003; Nijstad & Levine, 2007). In each of the three phases, the diverging step concerns "creating options" and the converging step concerns "evaluating options". Most of the published research on creative problem solving, at the individual and group level, has traditionally focused on the second of these three phases, solution finding, and within this phase, only on the ideation half of the two-step ideation-evaluation process (Kurtzberg, 2005; Mayer, 1999; Paulus & Yang, 2000; Torrance, 1955). This ideation half has been typically represented as "brainstorming". However, many of the most influential research of creativity give equal weight to evaluative processes (Baer, 2003).

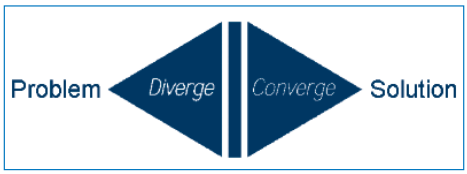

FIGURE 1
The traditional two-step diverging-converging process

In this paper, we will be focusing on the evaluation half of the two step ideation-evaluation process and we will also restrict our focus to only problem solving (the second phase of the three phase model). We concentrate on the problem solving phase for the sake of simplicity and to better fit our position into the existing published research, but the cognitive skills, behaviors, and attitudes that we discuss as necessary to execute the ideation-evaluation two step process are required for each phase of the creative problem solving model described above (Basadur et al., 1982).

Tools such as brainstorming are not effective unless there is a sufficient presence of cognitive, attitudinal and behavioral skills fundamental to the ideation-evaluation two-step process such as the principle of deferral of judgment through appropriate training (or facilitation). Such skills can be measured (Basadur & Finkbeiner, 1985) and are important factors in the success of the evaluation tool we call telescoping that we introduce in this paper. It is not just the tool itself that we are introducing, but also the skill in executing it.

Decision making research from a broader perspective

Criticism when generating ideas

In the broader decision making research field, the focus has typically been on decision making rules and processes employed by groups that are outside the scope of this paper, which is based on the separation of ideational thought from evaluational thought by employing the deferral of judgment paradigm (cf. Janis, 1972, 1971; Postmes et al., 2001; Schweiger, et al., 1989). Results usually are described in terms of decision quality in relation to group satisfaction and commitment to the group (Stasser & Birchmeier, 2003). In much of the published research on decision making in creative groups the focal ideas being decided upon by the members are not generated by the group but are provided to them as a given, and as such they are *decision groups* rather than brainstorming groups (Hough & Ogilvie, 2005; Greitemeyer et al., 2006; Stasser & Titus, 1985, 2003). Such research highlights the positive impact discussion that results in more informed decisions has on group creativity. As a result, much has been learned about how concepts like devil's advocacy, minority dissent, majority decision, and other decision making methods impact the creativeness of group decisions, but this research pays little attention to how such groups develop possible solutions to begin with. This includes for example, the extent to which devil's advocacy, minority dissent and other critical inquiry methods are used during the generation of ideas or whether these methods are employed only later, during convergence, to help the group reach a decision on one solution (cf. DeDreu & West, 2001; Schweiger, et al., 1989). This line of research tends to lead people to conclude that methods based on criticism and taking opposing viewpoints are the ways to generate good ideas, as these methods force group members to think critically about their ideas and to consider the counter ideas being suggested, which helps to improve the ideas in question, or leads to others not considered at the outset.

Based on these studies, some researchers have suggested that brainstorming could be improved if the rule against allowing criticism were changed or removed (DeDreu & West, 2001; Nemeth et al., 2004; Nemeth & Nemeth-Brown, 2003). Suggestions such as these, however, perhaps indicate a fundamental misunderstanding of how the two-step diverging-converging process works, and further, a misplaced

assumption that without criticism and conflict there is little if any critical thought during the diverging phase of brainstorming (Nemeth et al., 2004; Nemeth & Nemeth-Brown, 2003). The rule against criticism during diverging in brainstorming does not mean that participants are not supposed to engage in critical analysis of the contributions being made by the group. On the contrary, brainstorming only works if group members are actively thinking about the problems they are attempting to solve (Stanfield, 2000), and considering their ideas from multiple perspectives in order to build on them to develop even more ideas (Dougherty & Takacs, 2004; Lubart & Sternberg, 1995). Evidence of this can be found in studies that show that typically the best ideas developed during brainstorming sessions come in the latter stages of the diverging stage (Parnes & Meadow, 1960; Basadur & Thompson, 1986). The type of critical thought that is not allowed in the diverging stage of brainstorming is the evaluative criticism of ideas that are contributed (Osborn, 1953; Tjosvold et al., 2005). Rather than think about what is wrong with an idea, the skilled participant in brainstorming instead considers what is good about the idea and uses that information to then offer an improved idea built off the original contribution (Basadur, 1995). Critical evaluation of contributed ideas is delayed until the second, evaluative step of the process commences.

Evaluation by majority vote

Many creative groups seek to avoid the tension and conflict that can occur during idea evaluation by relying on majority vote. Van Gundy (1988) discusses the inability of groups to achieve consensus on the one solution that would be most likely to solve the problem because of differences in individual values and needs, ownership of a particular solution, or other factors and finds that such groups often resort to voting. Such procedures frequently result in suboptimal results and reduced commitment since voting creates winners and losers. The obvious drawback to employing majority decision rules is that whichever method is used, whether it involves tabulating private selections made by individual group members as in the nominal group technique (NGT), or by simply making decisions based on majority selection, voting involves deferring to the preferences of the majority and the result is preference-driven decision making, not information-driven decision making (Hastie & Kameda, 2005; Stasser & Birchmeier, 2003). Voting creates winners and losers, with neither group fully understanding the rationale of the other.

The telescoping method

Telescoping is a three-stage tool used in the evaluation step of the two-step ideation-evaluation. It is a tool for executing the second step of the two-step ideation-evaluation process and is applied *after* a group has completed generating solution ideas while invoking the deferral of judgment rule. The evaluation step of the aforementioned traditional two-step process begins once the group begins the first stage of the telescoping method, the initial selection of ideas by individual group members (see figure 2). Each group member identifies a small number (how many depends on the facilitators' discretion) of the generated ideas as their "best bets" deserving further examination from their individual points of view.

The second stage, "listening to understand", is one of non-judgmental clarification and explanation of the meaning of each (why they consider it valuable) of the selected "best bets" by each of the members who selected it. In practice, it is not uncommon that different members will have picked the same idea as a "best bet" for entirely different reasons and/or with very different interpretations of the idea. A rough rule, or law, is that "the less clearly stated the idea, the greater the likelihood of multiple reasons and meanings." Thus, the goal of this non-judgmental second stage of telescoping is to build understanding and respect for all points of view. The benefits of critical thought championed by decision scientists such as Stasser and Birchmeier (2003), that discussion breeds better decisions by making decision makers better informed, occurs in this second telescoping stage *without* argument or conflict. The second telescoping stage aids in the development of a group climate of personal safety necessary to surface any hidden profiles (Stasser & Birchmeier, 2003) that are related to group members' specific selections. The second telescoping stage also contributes to consensus building on whatever choices are finally selected (in stage three) but just as importantly, contributes to the eclectic emergence of brand new ideas or (improved versions of the ideas under consideration) because of the members enriched comprehension. We speak of comprehension as meaning not only of the ideas, but also of the situational context; the facts or reality surrounding the problem being solved as a whole. Finally, in the third stage of telescoping, the group works together to evaluate and

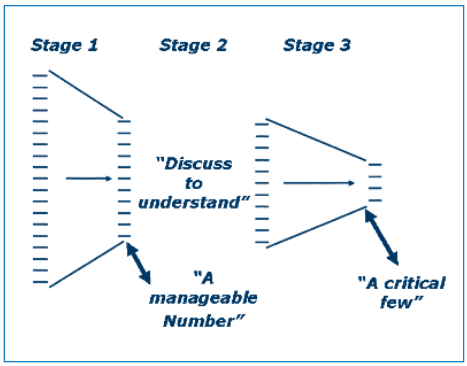

FIGURE 2
Telescoping method

achieve consensus on the critical few best options (or in some cases, one optimal option), to take forward to implementation planning.

It's often been said that in order to think well you have to have a sound comprehension of the facts about a situation. The telescoping process helps to drive out unwarranted assumptions and create a level of confidence in the quality of the information that is distilled from the discussion. Members achieve agreement on the quality of the options chosen and on the quality of the facts on which the options are based. Some options may be very well defined, while some remain somewhat less-well defined. In the latter case, the level of uncertainty is realized and accepted as a fact in itself. Indeed, the level of uncertainty may be precisely the reason why the group determines the fact or option is so important. In practice, options that are finally selected tend to be understood quite completely (the members are aware of which supporting facts are concrete and which ones may be shaky but with which they are willing to proceed). This telescoping method needs to be understood as a convergence tool which employs various skills, including consensus building skills, in the emergence of optimal solutions. As such, the members' skill in using this tool is of paramount importance. Training in the use the tool is the best approach, combined with independent facilitation. However, a skilled independent facilitator can ensure that a high level of skill is exercised by the group regardless of the individual members' skill levels.

Telescoping requires cognitive skills in order to work effectively

Work groups that develop healthy and productive processes tend to become highly skilled and capable over time in executing those processes (Milliken et al., 2003). Therefore, with respect to the specific process we have selected to study in this paper, (the two step ideation-evaluation process), we would expect that when groups solve problems using this two-step process successfully, the group members are able to diverge (create options) and converge (evaluate options) skilfully together (Basadur, 1995). Some of the skills group members can learn to apply telescoping convergence successfully include: View differences in perceptions as constructive and as a source of enriched options; Listen carefully to what others say about an option; Explain exactly what the words within an option mean to you; Use simple language; Restate promising options, if needed, to clarify; Deal directly and specifically with apparent discrepancies in understanding; Build on points of agreement. Evolve words that bridge small differences; Make sure unusual options get a good hearing (many people shy away from ideas that are different simply because they *are* different); Speak up for further exploring unpopular, but potentially strong options; Focus on making good selections, not protecting turf. Consider using "net benefit to the organization as a whole" as the group's primary criterion; Work toward full group participation. Don't let higher status or more vocal people swing the group; Share your concerns about risky new options with others because this may lead to fresh thinking and evolve such risky options into somewhat different options which preserve the innovative aspects of the idea but reduce potential discomfort and thus provide a better chance of successful acceptance and implementation.

Facilitation skills required for telescoping

Strong independent facilitation of the converging process using the telescoping method is indispensable, and especially so when unskilled groups are facilitated. Totally different from permissive leadership, which tends to lead to compromising, facilitators skilled in the application of telescoping act as process drivers. They are in charge of the process and their role is to help the team reach consensus on a small number of critical, distinctly different options (sometimes only one). It is appropriate and may be necessary to reword certain options to achieve clarity, and an important facilitator skill is to help the team evolve small words that bridge seemingly large differences. The facilitator strives to induce different points of view to emerge during both the clarification stage and the selection stage. This often leads to more innovative or unexpected new options to emerge. The process leader enforces deferral of judgment so that more complete understanding of the options and the emerging thoughts of the members is achieved and new ideas are allowed to emerge. The group works as a team under the guidance of the process leader to weld their thinking together and build highly valued final solutions which may be substantially different from the beginning versions. Specific attributes of an effective facilitator include; stays in process and out of content; asks probing questions; engages everyone in the dialogue; shows enthusiasm for the work at hand and trust in the process; keeps the group focused and avoids side conversations; captures complete thoughts as expressed and keeps them visible; listens to and writes what people say rather than editing or summarizing or saying it in language different from what was spoken; edits to increase understanding only with the agreement of the initiator of the thought; shows sensitivity to group dynamics; creates a climate of open sharing and demonstrates valuing every contribution made by the members; helps members express their thoughts when they are experiencing difficulty verbalizing what they are thinking.

How to use telescoping

In the first stage of the telescoping process, each group member selects ideas from the group's divergent list of ideas that he or she thinks or feels are

best. This initial evaluative selection by the group members becomes the first reduction of the number of ideas the group has to consider.

In the second stage of telescoping, the group members discuss each preliminary selection to clarify and gain more understanding of them (not to judge them). The facilitator instructs the group that in this stage they are to defer judgment and actively listen to the other group members' explanations of their selections. The facilitator guides the group through the step by asking each person who picked each option to explain their thinking using the following phrase: "Who picked this option. What does it mean to you and why did you pick it?" Participants should respond with brief explanations, and should not feel compelled to have to justify their selections to the rest of the group. The goal is to get the other group members to understand each others' thinking, not for each member to persuade the others why his or her choices are better.

The facilitator's role is to lead the group so that they do not revert to employing simple majority decision heuristics, and to instead help the group reach consensus on a small number of critical, distinctly specific different options that are commonly understood by the group members. It is appropriate and may be necessary to re-word certain options, unpack fuzzy options, and to help the team to evolve small words that bridge seemingly large differences to achieve clarity.

This step is crucial to surface any hidden profiles and to present the group with minority dissent options on equal footing with those options selected by the majority. Options selected by only one person are given the same treatment as options selected by several group members. With the group deferring judgment, it is likely that the unique insight of one member can make the group aware of an important option that was overlooked by the majority. The group may have overlooked the option simply due to the wide variety of options from which to choose, or it may also be due to the fact that the one member who made the selection has unique insight into why it is important which can sway the group to his or her viewpoint.

In the case of options that are selected by multiple group members, the facilitator asks each individual to discuss their reasons for making the selection. Often, the options chosen by multiple group members have different meanings to each of the members. Having each person who has chosen the option to explain what the option means and why he or she picked it will reveal that the option will have a variety of different meanings. In such cases, the facilitator captures these different meanings as separate options to ensure that the all of the options being discussed are clearly defined and have one interpretation.

Once the clarifying step has been completed and the group understands the various perspectives within the group, the facilitator directs the group to finalize a short list of options that everyone understands and agrees are the most important. It is important that the group doesn't try to keep all of the options alive by clumping specific options into one vague, all-encompassing notion, as the goal is to end up with clear, specific options. In situations where there are a number of options with somewhat similar meanings, and the group struggles with the direction to choose the best from among them, it is suggested that the group focus on choosing the options that serves as the best of the "family" (of similar options), which can be visibly "boxed", with the others in the family indicated as having been "put in the box". At the completion of the telescoping process groups have reduced their divergent lists down to a small number of critical, distinctly specific different options.

Telescoping helps a group to develop high value decisions through its unique method of creating consensus. In other words, how telescoping creates consensus decisions is the means to high value optimal decisions. Decision options evolve and change as members share and clarify their thinking. Telescoping requires simple language to be spoken. Options become much clearer as they are discussed in simple terms permitting improvements and even new replacement ideas to take shape. The second stage of telescoping is critical: it is a clarification stage, not a judgment stage. As consensus is built by increasing clarity of ideas and options, the options evolve and strengthen in value and mutual ownership is increased as everyone contributes to the development. Rather than viewing differences as disagreement, such differences are treated as constructive opportunities to enrich options and the means to more innovative options integrating the best thinking of everyone. This is superior to Maier and Hoffman's (1965) notion of "effective disagreement."

The benefits of using telescoping

Telescoping avoids relying on voting

Much of the research into group decision making focuses on majority versus minority groups (DeDreu & West, 2001). For example, will minority groups yield more quickly to majority groups under time constraints (Jackson et al., 1995; Kerr, 1981). The proposed telescoping method of group decision making acts to reduce, if not eliminate, such groups, and with it the decision making through voting that can accompany it. When more than one person selects an option each person responds in turn, as an individual. The directions given are to reveal what the option means to the focal person and why he or she picked it, not to attempt to explain what the particular option means to the group of people that selected it. This way each person explains all of their option selections and each voice is considered separately. The focus shifts away from the number of people selecting an option toward

considering the rationale behind choosing the different options. The result is that the group finally selects options based on the thinking behind them rather than based on the number of votes the options received, and we predict that:

Hypothesis 1: Of the final ideas selected, a significant percentage are ideas that would not have been selected if majority vote had been used as the selection method.

Hypothesis 2: Of the final ideas selected, a significant percentage of them are different ideas that emerged during the second and third stages of the telescoping process.

Hypothesis 3: Of the final ideas selected, a significant percentage of them are ideas that received only one vote in the first stage of the telescoping process and would have been eliminated.

Hypothesis 4: Final ideas selected exclude a significant percentage of the ideas voted best by the majority during the first stage of the telescoping process.

Telescoping increases participation and understanding

Prior research has examined the impact of participation on group consensus from the perspective of giving minority groups voice to articulate their viewpoints to the majority groups (Maier, 1960a). Relating this to creative problem solving, research indicates that minority groups are more willing to go along with the majority if they are allowed to participate during divergence and share their points of view (Moscovici & Doise, 1994). The telescoping method in creative problem solving groups extends participation into the second phase, convergence, by enabling all group members to elaborate on their evaluations of the group's divergent output regardless of whether they belong to the majority or minority groups.

This increase in the level of participation of team members contributes to enabling groups to surface potential misunderstandings and differences between group members as to the meaning of particular options, as well as to enable the group to better understand the various perspectives different group members have of the situation in question. This increased basis of understanding then offers additional opportunities for new or strengthened ideas. Based on this rationale we make the following predictions:

Hypothesis 5: During the clarification of ideas in the second stage of the telescoping process, new ideas emerge expanding the total number of ideas generated.

Hypothesis 6: During the clarification of ideas in the second stage of the telescoping process, new ideas emerge expanding the number of ideas proceeding to the third stage.

Method

Research design

A field experiment was conducted in which interfunctional problem solving teams in five hospitals brainstormed ideas to solve defined problems identified by senior leadership teams related to improving patient flow processes and reducing wait times for patients. All of the defined problems had emerged from process mapping sessions in each hospital which had identified key process bottlenecks, and an example problem definition would be: "How might we ensure every chemotherapy patient begins their treatment within one half hour of the scheduled start time?"

There were 34 teams across five hospitals. The senior leadership teams at each facility assigned people to the appropriate problem solving teams. Each team was comprised of six to eight members and was facilitated through the telescoping method by a skilled facilitator. Team members included doctors, nurses, specialists, administrative nurses, and members of the hospitals' management. For stage one, the initial evaluation selection, each participant selected five ideas, then the team members proceeded to stage two to clarify and build understanding of each idea that was selected by at least one member in stage one. In stage three, the teams selected the very best ideas for implementation. No requirements were imposed on the teams for the number of very best ideas to be selected for implementation. This is because, as in all-field research, the different problems required different circumstances.

The same two facilitators worked with all of the problem solving teams, either in tandem or separately. These facilitators were chosen to facilitate the teams because of they share strong similarities in their process facilitation styles and skills. The facilitators also documented the output of each session using the same format, including all of the ideas the teams generated, the initial evaluative selections made, any additional ideas developed after the second, clarification, stage, and the ideas that were finally selected.

The second author worked closely with the two facilitators to accurately analyze the documentation of all of the sessions and categorize the data. The data on the final ideas the groups selected are categorized the data into three types: 1) Final ideas that received the majority of votes during initial evaluative selection stage; 2) Final ideas that received only one vote during the initial evaluative selection stage, and; 3) Final ideas that the teams chose due to conversation and understanding developed during the clarification stage (this type includes ideas that may not have been selected by

anyone initially, ideas that were developed only after initial selection, ideas selected over other ideas that received the same number of initial votes).

Measures

The thoroughness of the documentation of the sessions and the practical stage-by-stage nature of the telescoping method enabled the measurement of the following variables:

Total ideas: The results of the divergent step of the diverging-converging two-step process represent the total number of idea alternatives the teams had to choose from. To capture the full range of alternative ideas the teams had to select from, we included the ideas that the teams added during the clarification stage in the total.

Initial selections: The facilitators documented which ideas were chosen by team members during the initial selection stage, and how many votes each idea received. All ideas that received at least one vote were counted as initial evaluative selections.

Ideas added after the clarification stage: The facilitators documented new ideas that surfaced as the team members explained and clarified their thinking behind each of their initial evaluative selections. These new ideas were added to the end of the idea generation lists. The second author discussed each team's total list of ideas with the two facilitators to accurately determine which ideas were added during the clarification stage and those that were not. There were very few occasions when the facilitators were not able to confidently determine whether or not an idea had been added as a result of clarification, but when they were uncertain the authors decided to err on the side of caution and omit the ideas from this category.

Final ideas: The final ideas the teams selected were documented by the facilitators and were clearly indicated by having "boxes" drawn around each one. One technique the facilitators use to engage the team members in making final selections is to ask the teams which ideas should be 'boxed'.

Final ideas that also received majority votes: Ideas that received the majority of team members' votes during the initial evaluative selection stage and were also chosen by the teams as final ideas.

Ideas initially chosen by the majority but not selected as final ideas: It was possible to determine for each team those ideas that were considered best during the initial selection stage, but were not selected by the group when they selected their final ideas. If the teams had used a majority vote evaluation procedure, however, these ideas would have been selected by the teams as among their best ideas.

Final ideas had teams used majority vote: We calculated this variable by combining the previous two variables, final ideas that also received the most initial votes, and ideas that were initially chosen by the majority of team members but that were not included in the teams final selection of ideas. Typically, it was clear which ideas received the majority of initial selections but in situations of uncertainty the second author met with the two facilitators to discuss and make final determinations. As the facilitators were so closely involved with the teams in the process, and then also documented the sessions, as well as the recency of the completion of the projects, their cognitive recall was very sound.

Final ideas that received one initial vote: This column represents the second type of final ideas, the number of ideas that received only one initial vote which the group subsequently chose as one of their final options. If the groups had relied on majority vote, none of these options would have been selected.

Final selections that resulted from clarification: Working with the facilitators to examine the documented sessions output, this variable reflects the third type of finally selected ideas: those that were selected by the group after the clarification stage through discussion. Included are those ideas that were selected while others with the same number of initial votes were not finally selected, indicating that discussion had to have occurred to select one but not the others. Also, some were final selections after not originally being chosen by anyone, due either to single ideas having multiple meanings or due to simple oversight, or to the fact that the ideas did not exist at the point of initial selection. If the team had relied on using majority vote, none of these options would have been selected.

Final ideas that would not have been selected had the teams relied on majority vote: This variable is calculated by combining the two previously described variables, final ideas that received one vote and final ideas that resulted from the clarification stage of the telescoping process. The rationale for this decision is simply the fact that none of the ideas of these two types would have been selected had the teams used a majority vote procedure to evaluate the divergent list of generated ideas.

Results

Based on the fact that none of the variables are independent and because they depend on the same team, and therefore the same session, each time, the hypotheses were tested using simple paired T-tests. Tables 1 and 2 contain a summary of the outcomes of each of the hypotheses tested and related statistics, respectively. The first four hypotheses focused on what impact the telescoping method would have on the final selected ideas problem solving teams would choose. Hypothesis 1 predicted that a significant percentage of final selections would not have been selected if majority vote had been used. The variables tested were the final ideas selected and the final ideas that would not have been selected if a majority vote procedure had been used. With the telescoping method the teams had a mean number of selected ideas of 4.5

Hypothesis		Paired differences					t	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% Confidence interval of the difference				
					Lower	Upper			
1	Without telescoping – With telescoping	–2.52941	1.41925	.24340	–3.02461	–2.03421	–10.392	33	.000
2	Ideas before 2nd and 3rd Stage final selection	–1.55882	1.10621	.18971	–1.94480	–1.17285	–8.217	33	.000
3	Ideas before 2nd and 3rd Stage final selection	–.97059	.93696	.16069	–1.29751	–.64367	–6.040	33	.000
4	Majority in final selection	1.29412	1.21927	.20910	.86869	1.71954	6.189	33	.000
5	Ideas Stage 1 – Stage 2	–1.08824	1.35664	.23266	–1.56159	–.61488	–4.677	33	.000
6	Total ideas – before clarification	1.08824	1.35664	.23266	.61488	1.56159	4.677	33	.000

Table 1
Paired sample tests results summary

Hypothesis	Pairs	Mean	N	Std. Deviation	Std. Error Mean
1	Without telescoping	1.9706	34	1.02942	.17654
	With telescoping	4.5000	34	1.54233	.26451
2	Ideas before 2nd and 3rd Stage final selection	2.9412	34	1.34708	.23102
		4.5000	34	1.54233	.26451
3	Ideas before 2nd and 3rd Stage final selection	3.5294	34	1.30814	.22434
		4.5000	34	1.54233	.26451
4	Majority in final selection	3.2647	34	1.48342	.25440
		1.9706	34	1.02942	.17654
5	Stage 1 Stage 2	10.6471	34	4.08161	.69999
		11.7353	34	4.80094	.82335
6	Total ideas before clarification	36.62	34	12.783	2.192
		35.5294	34	12.38581	2.12415

Table 2
Paired samples statistics summary

(*SD* = 1.54). Of the ideas selected with the telescoping method, only 1.97 (*SD* = 1.03) would have also been identified using a majority vote decision rule, supporting the notion that a significant percentage of the final selections would not have been selected if the majority vote had been used, $t(33) = 10.4$, $p < .000$. Therefore, hypothesis 1 is supported.

Hypothesis 2 predicted that of the final ideas selected, a significant percentage of them are ideas that emerged during the second and third stages of the telescoping process. The variables tested were the final ideas selected and the final ideas that were selected resulting from clarification. Of the final ideas selected, the participating teams had already identified on average 2.94 (*SD* = 1.35) ideas in the first stage of the telescoping process. The second and third stages of the telescoping process uncovered on average an additional 1.56 ideas (*SD* = 1.11), which is significantly different from the number of ideas that were only identified in the first phase, $t(33) = 8.2$, $p < .000$.

Hypothesis 3, which predicted that, of the final ideas selected, a significant percentage of them are ideas that received only one vote in the first stage of the telescoping process was also supported. The variables tested were the final ideas selected and the final selected ideas that initially received only one vote. Of the ideas 4.5 ideas that were on average selected by the teams, .97 (*SD* = .93) ideas had only received a single vote in the first stage of the telescoping process. The number of finally selected ideas would be significantly different without these initially mildly supported results $t(33) = 6.04$, $p < .000$. Interestingly, while hypothesis 3 was supported, for 13 of the 34 groups the clarification stage did not result in any new ideas. While impossible to say with any certainty, experience suggests that this is an indication of the lack of skill among group members. Due to the intense pressure hospital staff are under, it was not possible to conduct any meaningful training to all team members. Some employees, particularly the doctors and specialists, found it impossible to spend any time away from their work to receive training, and consequently may have relied more heavily on familiar decision procedures like majority vote.

Hypothesis 4 proposed that a significant percentage voted best by the majority during the first stage of the telescoping process would not be selected as best in the final ideas selections. The variables tested were the final ideas selected, and the ideas that were initially chosen by the majority but not selected as final ideas. After the first stage of the telescoping process, the teams on average selected 3.26 ideas (*SD* = 1.48) based on a majority vote decision rule. Only 1.97 (*SD* = 1.03) of these ideas were retained throughout the three telescoping stages. The difference, in other words ideas that were later in the process no longer considered to be interesting enough, is significant, $t(33) = 6.19$, $p < .000$. Therefore hypothesis 4 is supported.

Hypotheses 5 and 6 focused on the impact of the clarification stage of the telescoping method. Hypothesis 5 predicted that a significant percent-

age of new ideas emerging during the clarification stage of the telescoping process will be added to expand the list of initially selected ideas in stage one of the process. After stage 1, initial selection, the teams identified an average of 10.7 ideas (*SD* = 4.08). With the additional clarification stage of the telescoping process, the teams on average identified 11.7 ideas (*SD* = 4.80), an increase of 1.09 ideas, $t(33) = 4.677$, $p < .000$. During the analysis, however, one team was revealed to be a significant outlier. In this team's session, the clarification stage resulted in six new ideas, of which five were eventually selected as the team's six final ideas. The second author conferred with the facilitator who ran the session, who explained that the result was due to some team members' inability to plainly articulate their ideas and as a result the ideas were vague. As the facilitator had foreseen this occurrence, he had patiently worked with team members to better articulate the ideas in question and the six new ideas are what the team produced. Since this occurrence was regarded as being normal in the experience of the facilitators it was decided keep the team in the dataset. However, we conducted a second analysis without the team in question. After stage 1, the teams identified an average of 10.55 ideas (*SD* = 4.08). With the additional clarification stage of the telescoping process, the teams on average identified 11.48 ideas (*SD* = 4.80), a significant increase of 0.93 ideas, $t(32) = 4.644$, $p < .000$. Therefore, hypothesis 5 is supported.

Finally, hypothesis 6 predicted that as a result of clarification during stage 2 of the telescoping process, a significant percentage of new ideas are added to the total number of ideas generated by the groups. Before clarification, the teams generated on average 35.5 ideas (*SD* = 12.4). After clarification the teams had generated a total of 36.6 ideas (*SD* = 12.8), a significant increase of 1.09 ideas, $t(33) = 4.68$, $p < .000$. Hypothesis 6 is supported. It should be noted, however, that the statistical results are nearly identical to those of hypothesis 5. It raises the question of whether the ideas added during the clarification process take on added importance to team members due to the effort that they expended to produce these clarified ideas – essentially, "We worked extra hard to develop these ideas so we had better select them – or whether it is due to the increased quality of the ideas that resulted from the extra effort. Considering that the teams were also tasked with implementing their final ideas, it seems likely that the increased quality of the clarified ideas is the more likely explanation.

Summary and discussion

Our paper introduces a cognitive methodology, called telescoping, for groups to learn to apply and share empirical evidence that, if performed skillfully by a problem solving group, can significantly improve the quality of the ideas being evaluated *while they are being evaluated*. In our study, there were significant advantages for the teams in employing the telescoping method in evaluating and selecting the best solution ideas in a creative problem solving task using the two step ideation-evaluation process versus employing majority voting. Simply put, more and better solutions emerged after telescoping.

While studies of group creativity have focused almost exclusively on understanding and improving how solution ideas are generated (ideation), and very little on understanding and improving how solution ideas are evaluated (evaluation), our focus has been to increase understanding of how ideas are evaluated. The results support our propositions that a sound evaluation methodology can contribute much more than just making good judgments and decisions among already selected options. We have also focused on increasing understanding of the specific cognitive, attitudinal and behavioral skills required to execute the telescoping process well and permit the best solution ideas to evolve and emerge during evaluation. From a broader perspective, we have also attempted to build greater understanding, and to reduce misunderstanding, of the two step ideation-evaluation process (which is the creative problem solving theory most often tested in creativity research). Fundamentally, cognitive, behavioral and attitudinal skills in executing this process are necessary and part and parcel of the process itself, and the evaluation step requires a tool and skill equally as powerful as the brainstorming tool and skills are in the ideation step.

This increased understanding of the ideation-evaluation process or theory is critical to bridging group decision making literature and the creativity (or creative problem solving) literature and bringing clarity to attempts in the decision making literature to improve upon inconsistent results achieved in the creativity research testing brainstorming as a tool. Some researchers have suggested injecting criticism and judgment during brainstorming, that is, they have suggested *changing the tool*. On the contrary, we believe that the inconsistent results achieved in the creativity research are not due to the tool of brainstorming being inadequate, but instead are due to the *lack of skill* of the participants in the research in executing a very good tool. Misunderstandings of how the two-step diverging-converging process works and the skills required to execute it can lead to such well-intentioned but faulty suggestions. In fact, the rule against criticism during diverging in brainstorming does not mean that participants are not supposed to engage in critical analysis of the contributions being made by the group. Indeed, quite the opposite is true. Brainstorming only works well if group members are actively thinking about the ideas being generated in order to build on them to develop even more ideas. In contrast, the type of critical thought that is *not* allowed in brainstorming is the negative judgment and criticism of ideas that are contributed. Rather than think about what is *wrong* with an idea, the skilled participant in brainstorming instead consid-

ers what is *good* about the idea and uses that information to then offer an improved or different idea built off the original contribution. The same thinking skill is vital to executing telescoping during the evaluation step following brainstorming using telescoping. For example, during the second stage of telescoping, information-sharing and clarification are completely performed without judgment, and group members feel free to share all thoughts and additional ideas. In this way, the second stage can be considered to be in fact a *building* stage. The active listening that results by fellow group members ensures that ideas are understood in the context in which they are contributed so that in the subsequent third stage of telescoping, the quality of the idea selection work is enhanced by such increased understanding.

Future research

As above, we have also attempted to suggest how telescoping may overcome many of the well known obstacles identified in the decision making literature to achieving a combination of high quality ideas with a high level of consensus among team members. Perhaps this concrete evaluation tool will facilitate fresh opportunities for future study of these issues and other questions about improving evaluation similarly to how brainstorming has provided a concrete tool to facilitate the study of divergent thinking. Other fruitful areas could include studying telescoping in the context of concepts and methods like devil's advocacy, minority dissent, and other critical inquiry and decision making methods.

In terms of future research directions, we suggest examining our predictions that there are additional measurable and valuable advantages for telescoping which were outside the scope of our experiment in this study. For example, future studies should examine the degree of task satisfaction experienced by telescoping teams versus other methods and also the degree of commitment to implement and implementation success rates. Also, the transferability of the telescoping skills to every day work seems like an exciting opportunity for researchers with interests in talent development and training. As well, studies should focus on deepening understanding of the role of the facilitator in telescoping. Comparisons could be made of groups working with and without a facilitator and with and with out training in the skills of telescoping.

Conclusion

The main focus of our study is on understanding and improving the way ideas are evaluated rather than how they are generated. We have tried to show how evaluation has the potential to contribute much more than just making good choices among options. To do this, we have introduced and empirically tested an effective cognitive methodology, called telescoping, for groups to learn to apply to improve their ability to evaluate. We have also attempted to build understanding that like any other tool, telescoping requires skill in applying the tool. Tools alone are of little value. We have described in detail the specific cognitive, attitudinal and behavioral skills required for group members to participate effectively in telescoping and how this can significantly improve the quality of the ideas being evaluated while they are being evaluated permitting the very best ideas to evolve and emerge with the consensus needed to help assure commitment for successful implementation. Finally, we have also attempted to bridge the creativity and decision making literatures by suggesting the potential that the telescoping method appears to offer as a mechanism to overcome many of the well known obstacles identified in the decision making literature to achieving decisions that are both high quality and highest level of consensus. We hope future studies of creative problem solving groups will be able to use telescoping as a concrete evaluation tool similarly to how brainstorming has provided a concrete ideation tool.

References

Baer, J. (2003). Evaluative thinking, creativity, and task specificity: Separating wheat from chaff is not the same as finding needles in haystacks. In Mark A. Runco (ed.), *Critical Creative Processes* (pp. 129-151). Cresskill NJ: Hampton Press, Inc.

Basadur, M. (1995). *The Power of Innovation.* London: Pitman Professional Publishing.

Basadur, M., Gelade, G. (2005). Modeling applied creativity as a cognitive process; Theoretical foundations. *The Korean Journal of Thinking and Problem Solving, 15;* 13-41.

Basadur, M., Graen, G. B., Green, S. G. (1982). Training in Creative Problem Solving: Effects on Ideation and Problem Finding in an Applied Research Organization. *Organizational Behavior and Human Performance, 30;* 41-70.

Basadur, M., Runco, M., Vega, L. (2000). Understanding how creative thinking skills, attitudes and behaviors work together: A causal process model. *Journal of Creative Behavior, 34;* 77-100.

Basadur, M., Thompson, R. (1986). Usefulness of the ideation principle of extended effort in real world professional and managerial problem solving. *Journal of Creative Behavior, 20;* 23-34.

Brightman, H. J. (1988). *Groupthink. Group Problem Solving: An Improved Managerial Approach.* Atlanta: College of Business Administration, Georgia State University.

Chen, M. H. (2006). Understanding the benefits and detriments of conflict on team creativity processes. *Creativity and Innovation Management, 15;* 105-116.

Dougherty, D., Takacs, C. H. (2004). Team play: Heedful interrelating as the boundary for innovation. *Long Range Planning, 37;* 569-590.

Csiksentmihalyi, M. (1975). *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play.* New York: Jossey-Bass Inc.

DeDreu, C. K. W., West, M. A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology, 86;* 1191-1201.

Greitemeyer, T., Brodbeck, F. C., Schulz-Hardt, S., Frey, D. (2006). Information sampling and group decision making: The effects of an advocacy decision procedure and task experience. *Journal of Experimental Psychology Applied, 12;* 31-42.

Hastie, R., Kameda, T. (2005). The Robust Beauty of Majority Rules in Group Decisions. *American Psychological Association, 112;* 494-508.

Hoffman, L. R. (1961). Conditions for creative problem solving. *Journal of Psychology, 52;* 429-440.

Hoffman, L. H., Harburg, E., Maier, N. R. F. (1962). Differences and disagreement as factors in creative group problem solving. *Journal of Abnormal and Social Psychology, 64;* 206-214.

Hough, J. R., Ogilvie, D. (2005). An Empirical Test of Cognitive Style and Strategic Decision Outcomes. *Journal of Management Studies, 42;* 415-446.

Isaksen, S. G, Lauer, K. J. (2002). The climate for creativity and change in teams. *Creativity and Innovation Management, 11;* 74-86.

Jackson, S. E., May, K. E., Whitney, K. (1995). Understanding the dynamics of diversity in decision-making teams. In: R. A. Guzzo, E. Salas et al. (Eds.), *Team Effectiveness and Decision Making in Organizations* (pp. 204-261). San Francisco: Jossey-Bass.

Janis, I. L. (1971). Group Think. *Psychology Today, 5: 6.*

Janis, I. L. (1972). *Victims of groupthink: Psychological studies of foreign policy decisions and fiascoes*. Boston: Houghton-Mifflin.

Kurtzberg, T. R. (2005). Feeling creative, being creative: An empirical study of diversity and creativity in teams. *Creativity Research Journal, 17;* 51-65.

Lubart, T. I. (2001). Models of the creative process: Past, present and future. *Creativity Research Journal, 13;* 295-308.

Lubart, T. I., Sternberg, R. J. (1995). An investment approach to creativity. In S. M. Smith, T. B. Ward, R. A. Finke (Eds.), *The Creative Cognition Approach* (pp. 271-302). London: MIT Press: London.

Maier, N. R. F., Hoffman, L. R. (1960a). Using trained "developmental" discussion leaders to improve further the quality of group decisions. *Journal of Applied Psychology, 44;* 247-251.

Maier, N. R. F., Hoffman, L. R. (1965). Acceptance and quality of solutions as related to leaders' attitudes toward disagreement in group problem solving. *Journal of Applied Behavioral Science, 1;* 373-389.

Mayer, R. E. (1999). Fifty years of creativity research. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 449-460). New York: Cambridge University Press.

Milliken, F. J., Bartel, C. A, Kurztberg, T. R. (2003). Diversity and creativity in groups: A dynamic perspective on the affective and cognitive processes that link diversity and performance. In B. Nijstad, P. B. Paulus (Eds.), *Group Creativity: Innovation Through Collaboration* (pp. 32-62). New York: Oxford University Press.

Moscovici, S., Doise, W. (1994). *Conflict and consensus.* Thousand Oaks, CA: Sage Publications.

Nemeth, C. J., Nemeth-Brown, B. (2003). Better than individuals? The potential benefits of dissent and diversity for group creativity. In: B. Nijstad, P. B. Paulus (Eds.), *Group Creativity: Innovation Through Collaboration* (pp. 63-84). New York: Oxford University Press.

Nemeth, J. C., Personnaz, B., Personnaz, M., Goncalo, J. A. (2004). The liberating role of conflict in group creativity: A study in two countries. *European Journal of Social Psychology, 34;* 365-374.

Nijstad, B., Levine, J. (2007). Group creativity and the stages of creative problem solving. In M. Hewstone, H. Schut, J. de Wit, K. van den Bos, & M. Stroebe (Eds.), *The Scope of Social Psychology: Theory and Applications* (pp. 159-171). New York: Psychology Press.

Nijstad, B., Paulus, P. B. (2003). Common themes and future directions. In B. Nijstad, P. B. Paulus (Eds.), *Group Creativity: Innovation Through Collaboration.* New York: Oxford University Press.

Paulus, P. B, Yang, H. C. (2000). Idea generation in groups: A basis for creativity in organizations. *Organizational Behavior and Human Decision Processes, 82;* 76-87.

Pedhazur, E., Pedhazur-Schmelkin, L. (1991). *Measurement, Design, and Analysis: An Integrated Approach.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Phillips, L. (1984). A theory of requisite decision models. *Acta Psychologica, 56;* 29-48.

Postmes, T., Spears, R., Cihangir, S. (2001). Quality of decision making and group norms. *Journal of Personality and Social Psychology, 80;* 918-930.

Reitzschel, E., Nijstad, B., Stroebe, W. (2006). Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection. *Journal of Experimental Psychology, 42;* 244-251.

Runco, M. A. (2003). Idea evaluation, divergent thinking, and creativity. In M. A. Runco (Ed.), *Critical Creative Processes* (pp. 69-94). Cresskill, NJ: Hampton Press.

Runco, M. A., Basadur, M. S. (1993). Assessing ideational and evaluative skills and creative styles and attitudes. *Creativity and Innovation Management, 2;* 166-173.

Runco, M. A., Smith, W. R. (1992). Interpersonal and intrapersonal evaluations of creative ideas. *Personality and Individual Differences, 13;* 295-302.

Runco, M. A., Vega, L. (1990). Evaluating the creativity of children's ideas. *Journal of Social Behavior and Personality, 5;* 439-452.

Schweiger, D. M, Sandberg, W. R, Rechner, P. L. (1989). Experiential Effects of Dialectical Inquiry, Devil's Advocacy, and consensus Approaches to Strategic Decision Making. *Academy of Management Journal, 32;* 743-772.

Stanfield, R. B. (2000). *The Art of Focused Conversation.* BC: New Society Publishers.

Stasser, G., Birchmeier, Z. (2003). Group Creativity and Collective Choice. In B. Nijstad, P. B. Paulus (Eds.), *Group Creativity: Innovation Through Collaboration* (pp. 85-109). New York: Oxford University Press.

Stasser, G., Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sharing during discussion. *Journal of Personality and Social Psychology, 60;* 1467-1478.

Stasser, G., Titus, W. (2003). Hidden profiles: A brief history. *Psychological Inquiry,14;* 304-313.

Sternberg, R. J., Lubart, T. L. (1999). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), Handbook of creativity (pp. 3-15). New York: Cambridge University Press.

Tjosvold, D., Sun, H. F., Wan, P. (2005). Effects of openness, problem solving, and blaming on learning: An experiment in China. *The Journal of Social Psychology, 145;* 629-644.

Torrance, E. P. (1955). Some Consequences of Power Differences on Decision Making in permanent and temporary groups. In P. Hare, E. F. Borgatta, R. F. Bales (Eds.), *Small Groups.* New York: Alfred A. Knopf.

Van Gundy, A. (1988). *Techniques of Structured Problem Solving.* 2nd ed. New York: Von Nostrand Reinhold Co.

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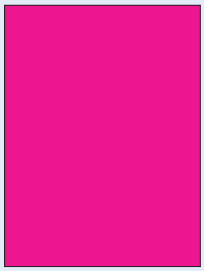

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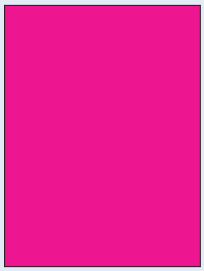

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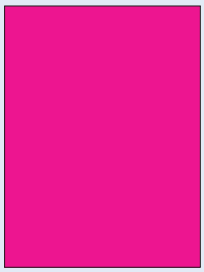

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