

Expanding Communication Expectations: Examining Audience Understanding of Scripts Through Fold and Swap Strategies

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Abstract

This entry presents cognitive-based strategies, called folds and swaps, communication professionals can use to introduce new concepts to different groups. A novel extension of prototype theory and script theory from cognitive psychology and linguistics, these strategies can help create messages that add, or fold, new ideas, activities, or items into existing processes. Communication professionals can also use these strategies to develop messaging that shifts, or swaps, the location individuals associate with performing different activities. Through an application of folds and swap strategies, communication professionals can help audiences contextualize new approaches to everyday activities.

Keywords

behavior, cognition, design, expectations, persuasion, psychology, usability

The human brain is an amazing data processor, but it can only engage with a limited amount of information at one time (van Merriënboer & Sweller, 2010). In fact, the brain can only process a fraction of the sensory input it receives from the senses. Known as cognitive load, this processing limit restricts what humans can actively—

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or consciously—think about at any point in time (Sweller, 1988). The brain therefore relies on different cognitive mechanisms to subconsciously address much of this information (Kirschner, 2002; van Merriënboer & Sweller, 2010). These mechanisms influence how humans perceive and respond to different verbal, visual, and multimodal information. As a result, these cognitive mechanisms often play a core role in human communication within and across media (see Heyes, 2018; Yablonski, 2020). The subconscious nature of these mechanisms means humans are rarely aware of how they shape expectations and behaviors. The better individuals understand how these dynamics operate, the more effectively they can convey ideas and information to different groups.

Two interconnected cognitive mechanisms affecting communication are prototypes and scripts. Prototypes are mental models that affect how individuals recognize and use items during the communication process (Rosch, 1978; Aitchison, 1994). Scripts, in contrast, are mental models that influence how humans behave in a setting and respond to location-related messaging (Schank & Abelson, 1977; Tomkins, 1978, 1987). By understanding prototypes and scripts, individuals working in communication-related fields can better address different communication situations (St.Amant, 2018, 2021; Vukosovich & Kostic, 2022). Communication professionals can then use this understanding to craft messages that prompt others to accept and engage in new and different activities. This understanding, moreover, can help communication professionals modify the locations where individuals perform an activity. Prompting such behaviors, however, involves developing content that connects to existing mental models and facilitates the acceptance of new items and processes.

In this entry, the authors present two (inter)connected and novel approaches communication professionals can apply to guide mental models in ways that result in certain behaviors. Specifically, the approaches the authors propose examine how the modification of certain prototype and script dynamics could prompt audiences to

- Adopt—or fold—new items into existing processes
- Change—or swap—the setting associated with performing a familiar activity

These fold and swap approaches focus on the ways mental models shape expectations and behaviors. Communication professionals can use these approaches to create messages/content that effectively facilitate the acceptance of new items and actions. Ideally, communication professionals can use such folds and swaps to increase the adoption of new perspectives, items, or actions associated with using products or performing processes.

These ideas of folds and swaps represent an extension of St.Amant's (2018, 2021) earlier work on cognition and usability. For this reason, the authors first explain how prototypes and scripts shape usability expectations and associated actions. The authors then examine how such cognitive mechanisms can prompt audiences to shift their perspectives and behaviors based on subconscious prototype and script dynamics (per

St.Amant, 2018, 2022). Next, the authors introduce two communicative strategies of metalinguistic nature—folds and swaps—individuals can use to tap mental models in order to prompt new usability-related attitudes and behaviors (Giordano, 2019, 2022). In presenting these ideas, the authors provide examples of how these fold and swap strategies can help explain the adoption of novel usability behaviors associated with new products or processes (see Giordano, 2022). The authors then conclude by providing suggestions on how to examine this fold and swap strategy in more detail via a focus on marketing/advertising materials.

Integrating Cognitive Theory Into Communication Practice

Using cognitive concepts to understand responses to verbal, visual, multimedia, and other kinds of content is not new. In fact, the field of usability has long applied aspects of cognitive psychology to identify, understand, and address user expectations and behaviors (Kuang, 2019). Schank and Abelson (1977), for example, examine how an understanding and application of cognitive factors—including cognitive scripts—could help identify and address user expectations related to technology design. Core figures in usability, including Cooper (1999) and Norman (2002), have since expanded such ideas by noting how experience shape expectations. Others, like Nielsen (1994), note how different cognitive mechanisms can affect the ways individuals perceive and use different products—including content associated with technology use. In fact, in his foundational 2002 text, *The Design of Everyday Things*, Norman mentions how cognitive mechanisms like scripts can play an important role in how users respond to and interact with different items from written texts to technical products. More recently, this focus on the cognitive has included work that examines persuasive design (Yocco, 2016), designing for global audiences (Schumacher, 2010), usability testing (Barnum, 2011), and behavioral change (Wendel, 2020).

Scholars in technical communication have also examined similar applications of cognitive theory to facilitate the creation of more usable content. Carliner (2000), for example, uses the idea of cognitive design—or understanding the cognitive factors affecting user expectations—as a foundational component for a three-part framework he proposes technical communicators use to engage in effective (i.e., usable) design practices. At roughly the same time, Mirel and Olsen (1998) advocate for how an understanding of cognitive factors could facilitate the development of technical communication classes for teaching technical professionals (e.g., software programmers) how to develop content that meets the expectations of different users. Likewise, Feinberg and Murphy (2000) examine how technical communicators and information designers could apply cognitive concepts such as cognitive load to create communication materials to better meet different users' expectations.

Over time, individuals in technical communication have explored new approaches for applying cognitive theory and concepts to develop usable content. Siau and Tan (2005), for example, extend the application of cognitive concepts to discuss how applications of cognitive mapping could help technical communicators engage more

actively in the development of information systems. Lentz and de Jong (2009) expand upon the application of cognitive concepts in technical communication by examining how cognitive mechanisms that create mental shortcuts could affect the assessment of usability problems. Rivers (2011), in turn, reviews how individuals in technical communication might approach research via a cognitive lens. Cheung (2017), moreover, notes how a merging of cognitive factors with plain language practices could help reduce social inequities. Others, such as Acharya (2019), take a more focused approach by discussing how cognitive factors can assist in creating usable medical materials for different international contexts.

More recently, scholars such as Verhulsdonck and Shalamova (2020) discuss the application of cognitive factors associated with behavioral design in order to create content that prompts particular use. At the same time, St.Amant (2018) notes how the application of cognitive factors—specifically prototypes and of scripts—can facilitate the creation of usable content on local and on international levels. St.Amant (2021) and Vukasovich and Kostic (2022) also examine how cognitive scripts can provide a framework for developing usable content for healthcare contexts. These applications are based on Melonçon's (2017) earlier idea of patient experience design (PXD) that sought to integrate usability practices into the design of content for patients.

This entry expands upon these prior applications of cognitive concepts in communication practices. The authors' objective is to explain how an understanding of cognitive mechanisms—specifically prototypes and scripts—can help introduce new ideas and approaches that influence the use of different products. To this end, the authors also explain how a targeted application of cognitive scripts and associated prototypes can serve as the foundation for two usability-related strategies they call the following:

- Folds: An approach used to introduce new content into a familiar context
- Swaps: An approach used to shift the context in which certain, recognized content is used

Foundational to these fold and swap strategies is the role cognitive models play in establishing user expectations and associated behaviors.

Understanding Mental Models

Prototypes and scripts are cognitive mechanisms individuals rely on to organize and process sensory input (Tse et al., 2007; Yamada & Itsukushima, 2013). Prototypes are the mental models humans use to identify objects, individuals, or locations (Aitchison, 1994; Rosch, 1978). Scripts, in turn, are the mechanisms that guide human's behavior in a setting in terms of moving through spaces, interacting with individuals, and using objects in a location (Schank & Abelson, 1977; Tomkins, 1978, 1987). Both prototypes and scripts are based on the experiences of the individual,

and both influence the communication practices of individuals and groups (St.Amant, 2022). An understanding of prototypes and scripts can thus help individuals more effectively communicate with or create communication materials for a particular audience.

Prototypes

Humans develop prototypes by repeatedly interacting with—or using—objects over time. Through such interactions, individuals learn to associate certain characteristics of an item—a combination of design aspects and properties—with the identification of that item (Aitchison, 1994; Rosch, 1978). Imagine, for example, an individual’s prototype (prototypical mental model) for a cup is a fist-sized, hollow, cylindrical item that has a handle on one side. Accordingly, whenever the individual encounters objects with those same characteristics, that person will likely identify the item as a cup because it matches their prototypical representation of the features a cup should have (i.e., what a cup should “look like”).

This identification process happens almost reflexively, and it involves how closely an item matches the individual’s prototype for cup. As a result, individuals are often unaware of such process. These associations, moreover, encompass a number of factors related to the identification of an item (Aitchison, 1994; Rosch, 1978). Essentially, prototype-related factors include the following:

- What an item is; for example, this item is a cup.
- What the item does/is used for; for example, a cup is used to hold liquids—generally, liquids individuals will drink.
- How that item is used; for example, an individual uses a cup by raising it to place the perimeter of the cup against the mouth and then tilting the bottom of the cup upward to pour liquid from the cup into the person’s mouth.
- What attitudes individuals associate with the item; for example, cups are used for drinking, are kept in kitchens, should be made out of X, and should have a handle.

Based on these prototype associations, once an individual recognizes an item via a prototype match, they also apply these factors of function, usage, and attitude to that item. In this way, the recognition of an item often brings with it expectations for how to use it in what is generally considered a recognized or acceptable way (St.Amant, 2022).

Humans also have prototypes for different kinds of individuals, and they often use such prototypes to identify the role certain persons play in a situation (Aitchison, 1994; St.Amant, 2022). For example, a prototype individuals use to identify a physician might be the characteristics of “wears a white lab coat and/or surgical scrubs” and “carries/has a stethoscope with them.” The prototype for that individual (i.e., “physician”) would also contain information on function (i.e., what that person does), usage (i.e., how to interact with that person), and attitude (i.e., assumption of what that person knows and how they will act). Again, such associations affect how a person

interacts with a particular, recognized individual. These associations also shape the activities that person considers legitimate for the recognized individual to perform. These associations, moreover, have important linguistic implications. Essentially, when humans encounter a word they know, they access the prototype associated with that term and allow that representation to guide their understanding of and actions relating to messages using that word (Aitchison, 1994). If, for example, instructions say, “Bring a cup to the dinner,” one automatically assumes what object to bring (i.e., a cylindrical, hollow vessel with a handle) and how it will be used (i.e., to hold liquids for drinking).

As prototypes collect a range of information into a single, interconnected unit, they reduce the overall information the brain needs to process at one time (Cook, 2006; Pass et al., 2004; van Merriënboer & Sweller, 2010). They also often operate on a subconscious level with recognition and associated assumptions occurring reflexively versus consciously (Bargh & Morsella, 2008; Cook, 2006; UXness, 2018). These factors make prototypes cognitively efficient, for they reduce overall cognitive load and free conscious memory to focus on other things in a setting (Kirschner, 2002; van Merriënboer & Sweller, 2010; Sweller, 1988). This efficiency, however, also means humans are generally unaware of when and how prototypes guide their actions and attitudes (Bargh & Morsella, 2008; Cook, 2006; UXness, 2018). As a result, individuals often do not know why they perceive, react to, and use items in certain ways (St.Amant, 2022; UXness, 2018). Such factors have important communication implications, for individuals often have different prototypes—and different assumptions—relating to language, identification, use, and attitudes.

Prototypes do not arise randomly; rather, they are created by exposure over time (Aitchison, 1994; Rosch, 1978). So, the more often one encounters a cup as an object with the characteristics of “fist-sized, cylindrical, hollow, has a handle, used for holding fluid/drinking,” the more the individual’s prototype for “cup” becomes the particular representation for that object. Because prototypes are created via exposure over time, they can vary from person to person based on experiences (Aitchison, 1994; Rosch, 1978). If, for example, a speaker and a listener have been exposed to different items as representing a cup (e.g., cylindrical object with a handle vs. rectangular object with no handle), then each could associate a different item with the same word. This difference, in turn, could greatly affect communication between them (it is the classic example of “we are both saying X, but are we actually talking about the same thing?”).

Because prototypes affect the way humans think about the messages they encounter, they play a central role in how effectively individuals understand, accept, and act upon the information presented in a message (St.Amant, 2022). Fortunately, prototypes are adaptable and can be expanded or enhanced based on different experiences (Aitchison, 1994; St.Amant, 2022). That is, as humans encounter new or modified representations of something, they can adapt their existing prototype for the related item accordingly. Such adaptations, however, are not automatic; rather, they require an accompanying explanation of how this new

representation is a variation on an existing prototype (e.g., how a rectangular item with no handle can actually be a kind of “cup”). This flexibility allows for humans to view an object in new ways over time as well as learn to recognize items as having new uses or existing in new forms.

Scripts

Prototypes also play a central role in the workings of a second kind of cognitive mechanism: scripts. A script is a mental model for what individuals expect to encounter and do in a particular setting (Schank & Abelson, 1977; Tomkins, 1978, 1987). Scripts also contain information on what actions individuals expect to perform (and are not permitted to perform) in a recognized location. Additionally, scripts contain information on how to interact with other individuals and objects in a recognized setting (see St.Amant, 2022). Such expected behaviors reflect the objective one wishes to accomplish when in a particular location.

All of these factors become combined into one mental model—or script—that guides expectations for and actions done in a recognized context (Schank & Abelson, 1977; St.Amant, 2022; Tomkins, 1978, 1987). For example, when individuals enter a restaurant, they know their objective for being in that location is to obtain food and drink. They also expect to encounter certain objects associated with achieving that objective (e.g., tables, chairs, menus, plates, and glasses) in that location—including associated expectations of how to use those items in that setting. Additionally, individuals often expect to interact with certain persons in a particular setting—persons who are central to achieving the related objective for being in that location (e.g., waitstaff to take orders when one is at a restaurant). All of these factors become collected into a single script that guides how individuals behave in that recognized location (Schank & Abelson, 1977; St.Amant, 2022; Tomkins, 1978, 1987).

Essentially, the moment individuals identify their location, they automatically access their related script for what to do and how in that setting (Schank & Abelson, 1977; Tomkins, 1978, 1987). Reflex then takes over and guides individuals through the activities they must perform to achieve the associated objective for being in that location. These reflexes include how to use the items the individual expects to encounter in that setting. So, the moment individuals identify such items in that location, they automatically know how to use those items in order to achieve the associated objective for being in that context.

By packaging interconnected, location-based actions into a single unit for cognitive processing, scripts reduce the effort spent actively thinking about such activities (Sweller, 1988; Tse et al., 2007; Yamada & Itsukushima, 2013). Scripts also allow humans to perform “standard” processes in a location via subconsciously guidance. As a result, scripts free conscious thought to focus on other, more cognitively demanding activities in that setting—such as having a conversation with someone else while eating at a restaurant (Postle, 2016; Sweller, 1988; Yamada

& Itsukushima, 2013). As with prototypes, individuals are rarely aware of when they allow subconscious, script-based processes to drive their behaviors. And, as with prototypes, scripts are created via experience over time, can vary from person to person, and can be adapted over time based on different experiences (Schank & Abelson, 1977; St.Amant, 2022).

Because scripts involve interacting with certain individuals and objects in a location, they also contain prototypes individuals use to identify those persons or items in that setting. In fact, scripts are a particular kind of prototype—that for location (i.e., a prototype of place; St.Amant, 2018). The process works as follows: When individuals enter a space, they quickly scan their surroundings to see how closely the characteristics of that setting match a particular prototype they have for a location. This matching identifies and activates a related script that then guides behavior in that setting (Schank & Abelson, 1977; St.Amant, 2022; Tomkins, 1978, 1987). Individuals also use script-related prototypes to identify central actors in that setting (e.g., identify waitstaff in a restaurant) and then interact with those actors per the associated script. Finally, individuals use prototypes for objects both to identify central items they expect to find and use in that space (e.g., cups, forks, and knives) and to readily use those items as noted in the related script (e.g., cups for drinking from and forks and knives for eating food).

Mental Models and Communication

Scripts and prototypes play a central role in communication, for they affect how humans create and interpret messages. When humans communicate, they access the mental representation, or model, for the item (prototype) or activity (script) they wish to convey when communicating (Lindstrom, 2010; Meek, 2013; Tyrkiel, 2021). They then

- use words to describe that item to others in verbal/textual communication
- create images that try to replicate the design of the item or illustrate a process
- design materials/technologies (e.g., websites) that contain the characteristics of that model (prototype) based on the assumption of how others will use those materials/technologies (scripts)
- provide information based on assumptions of what individuals will do and use in a location (scripts) as well as how individuals will interact with others in that location (scripts)

Essentially, prototypes and scripts represent what individuals think something should be or should encompass in a given context.

Based on such assumptions, individuals use words, visuals, and other forms of media to describe or recreate that representation for others (Eyal, 2014; Lindstrom, 2010; St.Amant, 2018). Accordingly, what individuals include in such messages reflects what their related prototypes and scripts encompass. So, the messages

individuals create reflect the assumption that the audience receiving a message can use those words, visuals, etc. to effectively recreate that same prototype or understand information in terms of the same script as the message's creator. The ability of an audience to comprehend and use the resulting message, however, becomes a matter of how closely the audience's prototypes and scripts for the related ideas match those of the person presenting information (Eyal, 2014; Lindstrom, 2010; Meek, 2013). It is at this point that communication issues often occur.

If the creator of and the audience for a message have similar mental models for prototypes/items and scripts/activities, then the transfer of information should be relatively effective. This is because audience members can use the prototypes and scripts they already have to conceptualize what items are or what processes entail when reviewing a message. If, however, audiences have different prototype and script associations from the creator of a message, confusion could result. Such situations might arise around identifying what something is (i.e., difference in prototype associations used to identify an item) or how an item is used (i.e., diverging prototype associations for how to use an item). Potential problems could also include confusion over where an individual is (i.e., inability to recognize a location) or what to do in that location (e.g., what individuals should use or with whom they should interact with in a setting). Essentially, the usability of a message is a matter of how closely the mental models of all involved overlap.

These factors mean that individuals who create messages can benefit from approaches that help identify, understand, and address the prototype and script associations of the audience who will use the information they provide (St.Amant, 2018, 2022). Moreover, by understanding such cognitive dynamics, individuals can effectively introduce new products and processes into a setting or shift the location where an action usually occurs (Eyal, 2014; Lindstrom, 2010; St.Amant, 2022). This shift can also be of a linguistic nature, as the items added to the script can be merely textual. In cat food advertising, for example, the word "gourmet" or "entrée" placed on the label of a can of cat food can change the script for feeding a cat from a banal activity to one associated with sophisticated dining. Similarly, textual elements can create new settings, thus changing script dynamics. In advertising, for example, the presentation of the product mineral water against a plain, white background and surrounded by the words "Ph, alkaline, sodium, hydration" can create the perception of viewing a healthcare product through the window of a pharmacy or a healthcare facility versus viewing it in the "beverages" section of a supermarket or corner store. In these ways, the linguistic power of prototypes and scripts is pivotal to shifting how individuals perceive items or products.

The effective introduction of new items or the relocating of activities often requires effective, related communication. Accordingly, communication professionals can use an understanding of prototype and script dynamics to play a more central role in product and service development as well as in related advertising campaigns. Central to such processes is applying an understanding of prototypes and scripts to create messages that guide human behavior in new ways. These

processes involve the use of communication materials to expand the existing prototypes and scripts a group of users has. The authors posit this process can be facilitated through the use of two prototype-script-related strategies they call “folds” and “swaps.”

Expanding Mental Models

Understanding how prototypes and scripts affect an audience’s perceptions and expectations is central to the following:

- Introducing new items and activities into a location via a process the authors call a *fold*.
- Changing perceptions of where a process occurs or where an item is used through a process the authors call a *swap*.

In this section, the authors explain how such folds and swaps operate as strategies for presenting information in certain ways. The authors also discuss how individuals can use these fold and swap strategies to shape perceptions and uses of items via certain communication practices.

Folds

Introducing a new item or activity into an existing process can be challenging. This challenge is because making such an introduction requires individuals to violate the subconscious expectations they have for an existing script. This violation involves adding items that are not present or accounted for in an existing script and thus not a part of that mental model for certain behavior in a location. The introduction of new items also means adjusting the prototypes involved in a script. (Essentially, it adds the prototype for the new item to the script for that context.) As such, two kinds of alterations must occur: one for an existing script (adding a new item to that script) and a second for the prototype of the new item added to that script (needed to recognize that new item in the future). By understanding how scripts and prototypes work, individuals can use different communication processes to effectively make such changes.

Imagine you wanted to introduce, or fold, a digital/self-operating checkout counter into the script for purchasing items at a grocery store. If that script contains an existing prototype for checkout area—a location where persons tabulate the final fee for purchases and then pay that fee—then such an addition requires the following:

- A point of introduction: where in the script the new item is introduced.
- A paralleling of prototype expectations: how to design the item so individuals readily recognize what the new item is and what it is used to do in that setting.

- A contextualization of the item: an explanation of how to use the new item to achieve the objective individuals associate with being in that location (e.g., purchasing products at a grocery store).

For a self-checkout counter, the point of introduction would need to be when customers expect to encounter a checkout area—or when they expect to pay for their purchase at the grocery store. That way, the new item’s introduction parallels the script element for when individuals expect to purchase items. Moreover, such an introduction occurs at a time when individuals are already thinking of and have accessed the script for “checkout.” As a result, they are ready to engage in that activity, and this readiness makes it easier to add—or fold—a new element into the existing script for that process.

The self-checkout counter also needs to be designed so it possesses the characteristics individuals use to identify a checkout area (prototype recognition) when grocery shopping. Such a design better aligns with—or parallels—existing reflexes that guide the use of the related item. Additionally, some form of instruction must be provided to explain how to use that self-checkout counter by providing step-by-step instructions for operating it. Such instructions help individuals contextualize the use of the new self-checkout counter into the existing script they have for grocery store.

These elements allow individuals to more readily fold that new item into their existing script for grocery store in a way that makes it easier for them to understand the following:

- What the new item is
- What that new item does
- How that new item is used in that setting

according to the dynamics of an existing script and related prototypes. When individuals encounter this new situation, this three-fold focus on

1. Point of introduction
2. Parallel prototypes
3. Contextualizing item

helps them more easily adjust their existing script to add the new element to an existing script process. Essentially, these three factors help individuals learn to perceive the new item as a variation that can occur in script for the related setting.

Central to this folding process is the fact that individuals are not creating a new script for a location. Rather, these three fold factors address the process by which humans naturally modify existing scripts and prototypes whenever they encounter a new representation of a known item, location, or process. In this way, individuals can rely on a modified script both to engage in a prior behavior (e.g., use a staffed checkout area) and to perform a novel behavior associated with a new item (e.g., self-checkout area) within the framework of an existing script.

Folds can also encompass the addition of completely new items or activities to a script-related process. Imagine a post office wanted customers to use a scale provided by the post office (new item) to weigh their mail prior to bringing it to the counter for mailing. This situation does not involve modifying an existing activity in a script (as with the self-checkout area). Rather, it involves adding a new activity (the use of a scale) to that script. The introduction of that new activity needs to be relatively pronounced in order to draw attention to it as there is no prior script element to build upon or revise per that activity (St.Amant, 2023). The introduction of the new activity could involve modifying the post office's entrance area to add a sign that uses large lettering and brightly colored images to introduce this new step (e.g., "Please to the scale kiosk here [arrow to indicate direction] to weigh your mail before you approach the counter."). Such messaging prompts audiences to access a certain existing script (for "mail item at post office") and identifies a particular modification to that script. Again, it is a case of starting the script modification process through the fold factor of point of introduction by identifying where the new items will be introduced.

A series of additional, similarly designed signs would then direct individuals to a location containing an item that looks like a postal scale—the flat, metal surface many post offices use to weigh mail. This second sign essentially applies the fold factor of parallel prototyping to tap an existing prototype for a recognized item (i.e., a post office mailing scale) individuals have encountered, recognize, and know the use of in that setting. As such, the added new element is not unknown. Rather, it exists as a modification of something users already expect to encounter (recognize) and play a role in (understands function/use) in that setting.

Finally, this image of a post office scale would be accompanied by a sign that identifies the item and notes the first step in the related process (e.g., "Please place your item on the scale below."—with arrow to indicate location of item). After individuals perform this initial task, either

1. the interface would instruct them on how to move through the other tasks in the related process or
2. they would review a nearby sign that provides instructions on how to perform this new activity.

This presentation of information contextualizes (the third fold factor) both the new items individuals will use and the new process they will perform using that item. It does so by connecting both to an existing script individuals have for the process they associate with mailing items at a post office.

Once individuals have completed this new activity, they need to receive final instruction on how to "get back on script"—or transition back into their existing script for interacting at a post office (e.g., "Thank you for completing this process; please take the receipt with the weight of your item printed on it, and proceed to the service line where an employee will confirm this weight and post your mail."). This addition for getting individuals back on script is crucial, for the introduction of a

new process into an existing script creates a deviation in an existing, reflexive behavior. If individuals are not placed back on the initial path for performing associated script activities, there is no guarantee they will do so, and they might not be able to get back “on script” and achieve their objective for being in that location. As a result, folds used to add a new activity to an existing script include the three fold factors of:

- A point of introduction: where in the script the new item is introduced.
- A paralleling of prototype expectations: how to design the item so individuals readily recognize both it and its uses.
- A contextualization of the item: an explanation of how to use the item to achieve the objective individuals associate with being in that location.

This fold process, however, also needs to include a new, fourth fold factor:

- Reorienting/returning to the original script: what information is needed to move the individual back into the original script for the related process so the rest of the actions in that activity proceed accordingly—and, ideally, reflexively.

This example situation reveals how an understanding of script and prototype dynamics can help guide new behaviors in locations. When applied in a systematic way, such knowledge can help individuals fold new items into existing scripts through approaches that address the cognitive processes guiding human behavior in a location.

Swaps

Folds seek to introduce new items into an existing script connected to a particular location. Swaps, in contrast, focus on shifting the location for where a familiar activity occurs. In this case, the objective is to “swap” the location individuals usually associate with a process to a different or new setting. Making such a change requires an understanding of how scripts and prototypes guide human behavior. Performing such a swap involves helping individuals

- isolate the objective they wish to achieve in a location
- identify the script(s) an audience has and that could help to achieve that objective
- determine the prototypes that guide objective-related behavior in a setting
- recognize parallel designs to prompt expected behavior in a location
- contextualize different processes via providing related information

The goal of swaps is to prompt individuals to readily access and easily engage in certain known activities in a different location or context.

A recent example of script swaps—or swaps—can be seen in drive-through COVID-19 testing stations that emerged in the U.S. (and elsewhere) during the recent global pandemic (see St.Amant, 2021). For many individuals in the U.S., the script for being tested for a viral infection was associated with the location of “hospital” or “clinic.” As a result, most individuals in the U.S. had an existing script connected to achieving the objective of being tested for a viral infection. The number of COVID-19 infections and the need for rapid, large-scale COVID-19 testing, however, quickly overwhelmed the locations commonly associated with these existing scripts (French et al., 2021). As a result, a need for a new, rapid, and large-scale method of delivering such testing emerged. To make such processes manageable, effective, and efficient, the associated approach needed to minimize confusion about what such testing entailed and what patients needed to do as they engaged in such testing in a new location.

The solution came in the form of a drive-through system of testing. In this system, patients drove their vehicle into a particular area to receive a specific service. They then remained in their cars and advanced—in a line of cars—to a point where a recognized individual provided the expected service. At the recognized “point of service,” a healthcare professional—identified as such by a particular uniform—would administer testing or provide patients with testing materials and explain how to perform the related test on themselves. Once the service was rendered or the process completed, patients exited the location via a designated area and continued on with their day.

The resulting process was relatively successful and addressed a core societal need (Araz et al., 2020). The speed with which such testing was adopted and accepted, moreover, played a central role in both the monitoring of and administering treatment for COVID-19 (Araz et al., 2020). The successful adoption and widespread use of this method reflect an effective script swap—one that transferred a process to a different script many individuals have for how to behave in a different location. Central to this swap was the effective transfer of a multipart process from one known location to another in order to use the related script for that other location.

Many individuals in the U.S. are familiar with the process of using drive-through areas to order from different establishments—usually food and beverage services. As a result, these individuals have an existing script for moving through such locations. This script, moreover, allows a relatively large number of individuals to quickly and effectively move through that location when receiving a particular service. The process occurs almost reflexively provided customers encounter certain features (i.e., prototypes) that identify the related location and initiate the associated script. These factors made the idea of moving COVID-19 testing from hospitals and clinics to a drive-through context a feasible solution to address a pressing public health need.

By having COVID testing areas replicate the design of recognized drive-through establishments (e.g., fast-food drive-throughs), one could prompt individuals to access existing scripts for that location (e.g., drive-throughs). Such scripts for drive-throughs included behaviors for how to move through and perform activities

in order to receive a service in that context. Initiating such a script became a matter of helping individuals recognize the location and access the desired behavior associated with it. The overall goal was to use the correct, recognized prototype to initiate the desired script-related process and implement other, recognized prototypes at key points in the related script in order to keep the process moving forward. If done effectively, one could swap the location where an audience performs a behavior to a different venue. Such an effective swap, moreover, could result in smooth movements and predictable activities when engaging in a familiar process in a new location.

For COVID-19 testing, this swap began by providing the features that helped individuals identify a particular script and access the essential, initial behavior in that script. Signs identifying where to enter the drive-through (prototype based on signs for accessing other drive-throughs) helped identify a location as a particular setting (i.e., a drive-through). This initial design also initiated a particular behavior in that location (i.e., enter drive-through here, line up behind other cars, and remain in the car). Having testing services (i.e., delivery of service) located at a particular point in this location then prompted the associated script behavior for waiting in line and then lowering one's car window when reaching the testing area (i.e., receive service here).

The fact that persons providing the service were in a particular "uniform" re-enforced such behaviors by again paralleling script-related expectations common for "drive-through." Additionally, the process of departing the testing area was indicated (and related behaviors accessed) via signs that identified where to exit the drive-through—again, using a design that paralleled those of recognized exit signs that appear in drive-through context.

While the overall process worked quite well, it did require the addition of information to explain activities at certain points (e.g., only drivers could receive a test). The relative speed and ease with which many individuals in the U.S. accepted and engaged with such a new process, however, reveal the potential of effective swaps. This example illustrates the swap strategy that involves five core swap factors:

1. Isolating the objective one wishes to perform, e.g., providing COVID-19 testing quickly and on a large scale in a central location.
2. Identifying a different script that could help achieve this objective, e.g., a script for drive-through services, which audiences already had and that can help achieve the desired objective.
3. Determining the prototypes central to this alternative script process, e.g., the signs, uniforms, and layout of space needed to access the script for "drive-through" and engage in related behaviors.
4. Recognizing parallel designs that can prompt desired script behaviors for achieving the related objective, e.g., creating signs that helped individuals identify and move through the testing location as they would for a drive-through service.
5. Contextualizing different processes by providing information essential to identifying and understanding different script processes, e.g., written information explaining who could receive testing and how test results would be returned.

This COVID-19 testing situation reveals how a swap approach based on scripts can relatively easily shift a process from one location to another. The key is to effectively tap into existing subconscious behaviors for a particular setting.

Similarly, by understanding how prototypes can guide actions through a location (e.g., signage), one can prompt individuals to perform a known behavior in a new location. When done effectively, such processes can occur with minimal instruction or confusion. Essentially, the more one can swap a process from one existing script into another existing script audiences have, the more easily one can help audiences engage in a relatively common behavior in a new location.

Technical communicators have only recently begun to examine how scripts and prototypes can facilitate effective communication and design practices (St.Amant, 2021; Vukasovich & Kostic, 2022). While others have alluded to script folds and script swaps (e.g., Rapaille, 2006), this entry presents an initial attempt to explain such items and the concepts upon which they operate. Ideally, communication professionals can apply these ideas of folds and swaps to study communication dynamics in other contexts. Additionally, the authors hope these two strategies—folds and swaps—can help with the creation of effective and usable communication materials and technologies in the future. The authors also wish to note that individuals can extend the ideas discussed here to examine other kinds of professional communication practices. Perhaps one of the areas well suited for such investigation is that of advertising.

Examining Fold and Swap Dynamics

A central question for the fold and swap strategies is the following: “How do they affect communication-related behaviors in our daily lives?” Answering this question involves reviewing where such items might appear and how they attempt to convey information in order to shape actions. Marketing communication, particularly advertising, can provide insight on these dynamics.

Advertising research has long focused on examining the psychological factors affecting recognition and behavior (see Duhigg, 2012; Eyal, 2014; Wu, 2016). In fact, some of the earliest advertising research examined how messaging could subconsciously prompt actions affecting consumer attitudes toward products (Wu, 2016). While some of this initial work was flawed, the focus on how communication could shape behaviors has persisted (Duhigg, 2012; Wu, 2016). So too has a focus on how individuals use mental models to understand such connections (Eyal, 2014; Thaler & Sunstein, 2008). The rise of globalization has moved such inquiry to examine advertising in international venues and in relation to how international consumers adopt—or purchase—new products in different market contexts. Such work provides initial examples of how folds and swaps could facilitate the introduction of new products to international audiences (see, for example, Giordano, 2022; Rapaille, 2006).

The ubiquity and scale of advertising, combined with the drive to target different markets, make it an effective area for examining fold and swap dynamics on a

comparative scale. These factors also make it relatively easy to engage in such research on a greater scale and in uniform ways across different sites. The issue becomes how to examine advertising in relation to folds and scripts in order to test such ideas.

One way would be to examine how new products—those for which audiences have no prior experiences or associated mental models—are marketed to consumers in different cultures (see, for example, Rapaille, 2006). Such research could review attempts to connect a new product to an existing context—or script—where it might be accepted and used quite easily if it connects to an existing mental model (folds). Alternatively, a review of marketing materials could reveal examples of encouraging an audience to use a known product in a new way in order to expand the market for that item (e.g., using everyday items as exercise aids). Such an examination could note if marketing materials use swaps to add that item to an existing set of behaviors, or script, individuals have for such “other” activities.

The proposed focus on advertising is not to preference this form of communication over others. Rather, such a focus can provide ready access to a relatively wide range of materials that focus on encouraging the acceptance of new items and (in theory) associated behaviors. Moreover, the speed with which organizations create new or updated products establishes an effective environment for comparing fold and swap dynamics within an industry or across a product line. As such, initial examinations of advertising materials could reveal practices that can be further investigated—or even applied—to different sectors (e.g., healthcare, environmental sustainability, and risk management).

Conclusion

The modern, global context allows change to happen with unprecedented speed and scope. The rapid emergence and evolution of communication technologies, moreover, create new complexities for this already chaotic context. Yet effective communication on local, regional, and global levels is essential to addressing such change. As a result, the success of messages often reflects the ability to adapt them to different settings and convey information in ways that prompt new attitudes and behaviors. Navigating such environments is not easy. Approaches that help address such communication dynamics offer a means for addressing these situations.

In this entry, the authors have presented folds and swaps as strategies communication professionals can use to operate in such complex contexts. In addressing mental models, these strategies provide an approach for connecting new ideas and activities to existing cognitive processes. They also present an approach for building upon such cognitive foundations to help audiences better conceptualize novel items and actions. In so doing, folds and swaps focus on expanding individuals’ prototypes and scripts to help them more readily contextualize new information. By applying folds and swaps strategically, communication professionals can help groups adapt to emerging situations. As advertising offers ready access to potential fold and swap situations, a review of such materials could help in understanding how mental models influence communication practices across topics.


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References

- Acharya, K. R. (2019). Improving the quality of health care through human-centered design: Contextualizing design of biotechnology implementation for better health care and patient safety. *Present Tense: A Journal of Rhetoric in Society*, 7(3), <https://www.presenttensejournal.org/volume-7/improving-the-quality-of-health-care-through-human/>
- Aitchison, J. (1994). Bad birds and better birds: Prototype theory. In V. P. Clark, & P. A. Eschholz, & A. F. Rosa (Eds.), *Language: Introductory readings* (4th ed., pp. 445–459). St. Martin's.
- Araz, O. M., Ramirez-Nafarrate, A., Jehn, M., & Wilsong, F. A. (2020). The importance of widespread testing for COVID-19 pandemic: Systems thinking for drive-through testing sites. *Health Systems*, 9(2), 119–123. <https://doi.org/10.1080/20476965.2020.1758000>
- Bargh, J. A., & Morsella, E. (2008). The unconscious mind. *Perspectives on Psychological Science*, 3(1), 73–79. <https://doi.org/10.1111/j.1745-6916.2008.00064.x>
- Barnum, C. M. (2011). *Usability testing essentials: Ready, set . . . test!*. Elsevier.
- Carliner, S. (2000). Physical, cognitive, and affective: A three-part framework for information design. *Technical Communication*, 47(4), 561–576.
- Cheung, I. W. (2017). Plain language to minimize cognitive load: A social justice perspective. *IEEE Transactions on Professional Communication*, 60(4), 448–457. <https://doi.org/10.1109/TPC.2017.2759639>
- Cook, M. P. (2006). Visual representations in science education: The influence of prior knowledge and cognitive load theory on instructional design principles. *Science Education*, 90(6), 1073–1091. <https://doi.org/10.1002/sce.20164>
- Cooper, A. (1999). *The inmates are running the asylum*. Sams Publishing.
- Duhigg, C. (2012). *The power of habit: Why we do what we do in life and business*. Random House.
- Eyal, N. (2014). *Hooked: How to build habit-forming products*. Portfolio/Penguin Books.
- Feinberg, S., & Murphy, M. (2000). Applying cognitive load theory to the design of web-based instruction. In M. Priestley, & B. Longo (Eds.), *IPCC/SIGDOC '00: Proceedings of IEEE professional communication society international professional communication conference and proceedings of the 18th annual ACM international conference on computer documentation: Technology & teamwork* (pp. 353–360). Institute of Electrical and Electronic Engineers. <https://doi.org/10.1109/IPCC.2000.887293>

- French, G., Hulse, M., Nguyen, D., Sobotka, K., Webster, K., Corman, J., Aboagye-Nyame, B., Dion, M., Johnson, M., Zalinger, B., & Ewing, M. (2021). Impact of hospital strain on excess deaths during the COVID-19 pandemic—United States, July 2020–July 2021. *Morbidity and Mortality Weekly Report*, 70(46), 1613–1616. <https://doi.org/10.15585/mmwr.mm7046a5>
- Giordano, W. (2019). Ethics and accessibility to knowledge in prescription drug commercials in the USA. *Anglistica AION: An Interdisciplinary Journal*, 23(1), 159–174. <https://doi.org/10.19231/angl-aion.2019110>
- Giordano, W. (2022). Textual and visual distractors/catalyzers in advertising. *Iperstoria*, 20(Fall/Winter), 325–350.
- Heyes, C. (2018). *Cognitive gadgets: The cultural evolution of thinking*. The Belknap Press of Harvard University Press.
- Kirschner, P. A. (2002). Cognitive load theory: Implications on cognitive load theory on learning and design. *Learning and Instruction*, 12(1), 1–10. [https://doi.org/10.1016/S0959-4752\(01\)00014-7](https://doi.org/10.1016/S0959-4752(01)00014-7)
- Kuang, C. (2019). *User friendly: How the hidden rules of design are changing the way we live, work, and play*. MCD-Farrar, Straus and Giroux.
- Lentz, L., & de Jong, M. (2009). How do experts assess usability problems? An empirical analysis of cognitive shortcuts. *Technical Communication*, 56(2), 111–121.
- Lindstrom, M. (2010). *Buyology: Truth and lies about why we buy*. Broadway Books.
- Meek, W. (2013). Basics of communication: The communication basics we all need to know. *Psychology Today*. <https://www.psychologytoday.com/us/blog/notes-self/201307/basics-communication>
- Melonçon, L. (2017). Patient experience design: Expanding usability methodologies for health-care. *Communication Design Quarterly*, 5(2), 19–28. <https://doi.org/10.1145/3131201.3131203>
- Mirel, B., & Olsen, L. A. (1998). Social and cognitive effects of professional communication on software usability. *Technical Communication Quarterly*, 7(2), 197–221. <https://doi.org/10.1080/10572259809364624>
- Nielsen, J. (1994). 10 Usability heuristics for user interface design. *Nielsen/Norman Group*. Retrieved from <https://www.nngroup.com/articles/ten-usability-heuristics/>
- Norman, D. (2002). *The design of everyday things*. Basic Books.
- Pass, F., Renkl, A., & Sweller, J. (2004). Cognitive load theory: Instructional implications of the interaction between information structures and cognitive architecture. *Instructional Science*, 32(1), 1–8. <https://doi.org/10.1023/B:TRUC.0000021806.17516.d0>
- Postle, B. R. (2016). How does the brain keep information “in mind”? *Current Directions in Psychological Science*, 25(3), 151–156. <https://doi.org/10.1177/0963721416643063>
- Rapaille, C. (2006). *The culture code: An ingenious way to understand why people around the world live and buy as they do*. Broadway Books.
- Rivers, N. A. (2011). Future convergences: Technical communication research as cognitive science. *Technical Communication Quarterly*, 20(4), 412–442. <https://doi.org/10.1080/10572252.2011.591650>
- Rosch, E. (1978). Principles of categorization. In E. Rosch, & B. B. Lloyd (Eds.), *Cognition and categorization* (pp. 27–48). Lawrence Erlbaum.
- Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals, and understanding*. Erlbaum Associates.
- Schumacher, R. M. (2010). Foundations and definition. In R. M. Schumacher (Ed.), *Handbook of global user research* (pp. 1–20). Elsevier.

- Siau, K., & Tan, X. (2005). Technical communication in information systems development: The use of cognitive mapping. *IEEE Transactions on Professional Communication*, 48(3), 269–284. <https://doi.org/10.1109/TPC.2005.853933>
- St.Amant, K. (2018). Reflexes, reactions, and usability: Examining how prototypes of place can enhance UXD practices. *Communication Design Quarterly*, 6(1), 45–53. <https://doi.org/10.1145/3230970.3230976>
- St.Amant, K. (2021). Creating scripts for crisis communication: COVID-19 and beyond. *Journal of Business and Technical Communication*, 35(1), 126–133. <https://doi.org/10.1177/105065192095919>
- St.Amant, K. (2022). Context, cognition, and the dynamics of design thinking: Cognitive methods for understanding the situational variables affecting usable design. *Technical Communication*, 69(1), 26–38. <https://doi.org/10.55177/tc796562>
- St.Amant, K. (2023). ARCO mapping the cognitive dynamics of communication expectations: An approach to designing usable content based on audience expectations. *Journal of Technical Writing & Communication*. Online first: <https://doi.org/10.1177/00472816231187>
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and user experience basics*. Yale University Press.
- Tomkins, S. S. (1978). Script theory: Differential magnification of affects. *Nebraska Symposium on Motivation*, 26, 201–236.
- Tomkins, S. S. (1987). Script theory. In J. Arnoff, & A. I. Rabin,, & R. A. Zucker (Eds.), *The emergence of personality* (pp. 147–216). Springer.
- Tse, D., Langston, R. F., Kakeyama, M., Bethus, I., Spooner, P. A., Wood, E. R., Witter, M. P., & Morris, R. G. M. (2007). Schemas and memory consolidation. *Science*, 316(76), 76–82. <https://doi.org/10.1126/science.1135935>
- Tyrkiel, K. (2021). How mental models affect both users and designers. *Editor X*. Retrieved, from <https://www.editorx.com/shaping-design/article/mental-models>
- UXness. (2018). What is the subconscious mind? <https://medium.com/uxness/what-is-the-subconscious-mind-fc7ce9d3162f>
- van Merriënboer, J. J. G., & Sweller, J. (2010). Cognitive load theory in health professional education: Design principles and strategies. *Medical Education*, 44(1), 85–93. <https://doi.org/10.1111/j.1365-2923.2009.03498.x>
- Verhulsdonck, G., & Shalamova, N. (2020). Creating content that influences people: Considering user experience and behavioral design in technical communication. *Journal of Technical Writing and Communication*, 50(4), 376–400. <https://doi.org/10.1177/0047281619880286>
- Vukasovich, C. A., & Kostic, M. N. (2022). Communicating during COVID-19 and other acute-event scenarios: A practical approach. *Journal of Business and Technical Communication*, 36(4), 524–534. <https://doi.org/10.1177/10506519221105493>
- Wendel, S. (2020). *Designing for behavior change: Applying psychology and behavioral economics*. O'Reilly.
- Wu, T. (2016). *The attention merchants: The epic scramble to get inside our heads*. Vintage Books.
- Yablonski, J. (2020). *Laws of UX: Using psychology to design better products and services*. O'Reilly.
- Yamada, R., & Itsukushima, Y. (2013). The effects of schema on recognition memories and subjective experiences for actions and objects. *Japanese Psychological Research*, 55(4), 366–377. <https://doi.org/10.1111/jpr.12016>
- Yocco, V. S. (2016). *Design for the mind: Seven principles of persuasive design*. Manning.

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