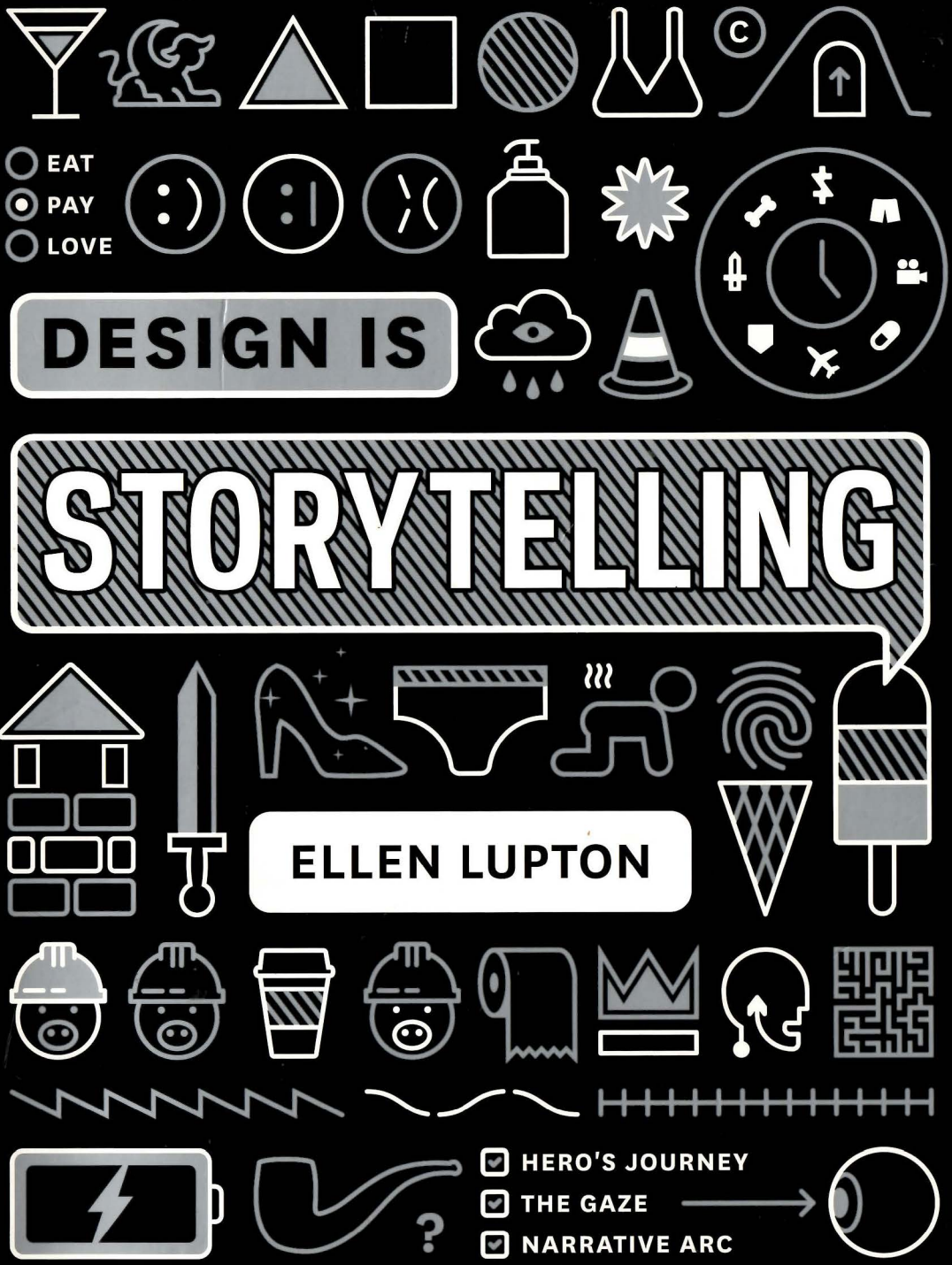
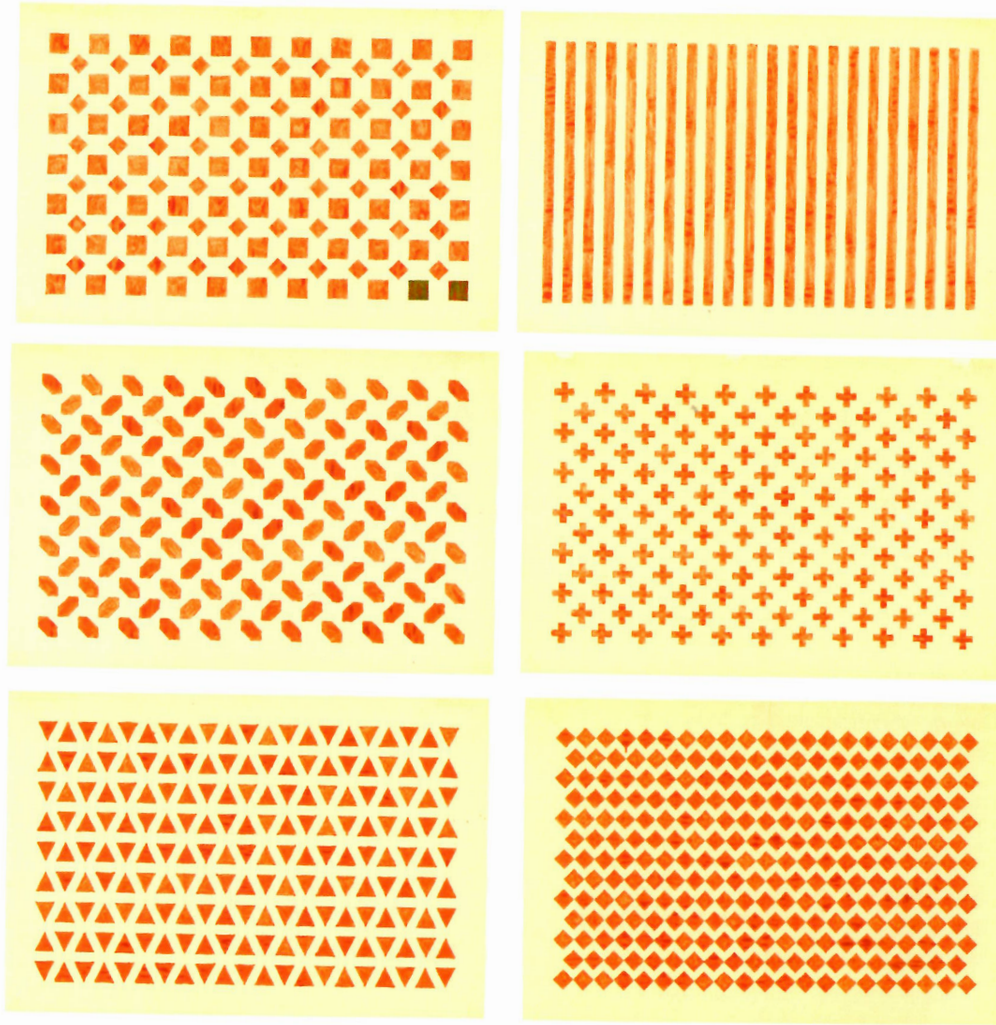

EAT
PAY
LOVE
DESIGN IS
STORYTELLING
ELLEN LUPTON
HERO'S JOURNEY
THE GAZE
NARRATIVE ARC

TOOL

Gestalt Principles

Look around and notice how objects emerge from other objects. Millions of hairs on your dog's back and thousands of tufts of fiber sprouting from the rug melt together to become a sleeping canine or a shaggy carpet. According to the **Gestalt principles** of perception, the brain converts a flood of data about color, tone, shape, movement, and orientation into distinct objects. These useful chunks of information are called *percepts*. A cluster of dots becomes a face. A clump of letters becomes a word. Dashes painted on a roadway define a path. Designers produce forms that stand out against the clutter of experience or pull away into the background.



NAPKIN SKETCHES Alexander Hayden Girard was a prolific designer of furniture, textiles, and interiors. Shown here are drawings he created for dinner napkins for a restaurant he designed in 1959. Each pattern stimulates and activates the eye. The spaces between elements undulate from figure to ground, as shapes group into dynamic stripes and diagonals.

Drawings, Napkin Designs for La Fonda del Sol Restaurant, ca. 1959; Designed by Alexander Hayden Girard (American, 1907–1993); USA; brush and watercolor on blueprint grid on white wove paper; 40.6 x 61cm (16 x 24in.); Collection of Cooper Hewitt, Smithsonian Design Museum, Gift of Alexander H. Girard; 1969-165-334, -324, -327, -331, -333, -335.

TOOL

Gestalt Principles

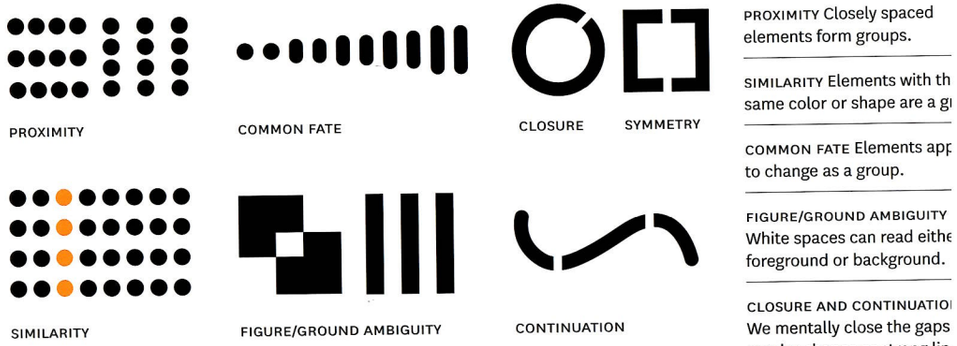
PARTS AND WHOLES German psychologists in the early twentieth century studied the active character of vision. They founded the Gestalt theory of perception, which explores how the brain groups elements into larger wholes.

Gestalt psychologist Max Wertheimer wrote, "The whole is different from the sum of its parts." In a map or diagram, elements grouped by size, shape, or color become distinct layers of information. In a field of text, letters group into words, lines, and columns. In an icon system, images take shape from geometric elements. In a patterned textile, repeated parts create a rhythmic surface. By playing with relationships between parts and wholes, designers make images come alive in peoples' minds.

Grouping is inherently active, allowing viewers to move between contradictory understandings of an object or element. A dot, dash, or letter is a single particle; at the same time it belongs to a continuous line or a larger field. Calling attention to the conflict between parts and wholes prompts mental work from viewers, foregrounding perception as a dynamic experience.

According to the Gestalt principle of *simplic* the brain groups elements in order to minimize the number of objects in a scene. Pursuing simplicity became an aesthetic imperative for modern designers.

Grouping underlies our perception of comp scenes in the living environment as well as two dimensional patterns and surfaces. The Gestal principle of *common fate* holds that items mov or changing simultaneously will form a group. A lion blends into the grass, camouflaged by it surroundings. As the lion leaps into action, she separates from the background. The common fate of her contour provides a life-or-death sig to potential prey. Figure/ground is the process of separating a dominant element from its surroundings. In a pattern of uniform stripes o checkerboard squares, the relationship betwe figure and ground is shifting and ambiguous.



GESTALT PRINCIPLES

PROXIMITY Closely spaced elements form groups.

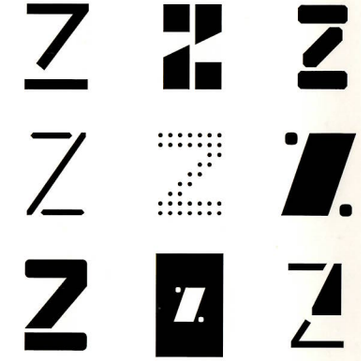
SIMILARITY Elements with th same color or shape are a gı

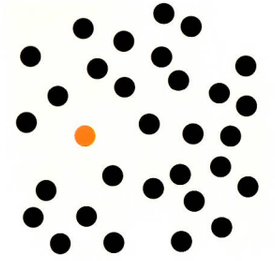
COMMON FATE Elements app to change as a group.

FIGURE/GROUND AMBIGUITY White spaces can read eithe foreground or background.

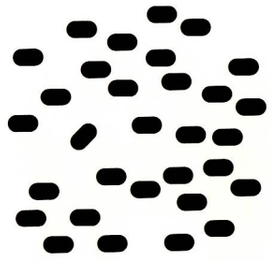
CLOSURE AND CONTINUATIO We mentally close the gaps regular shapes or strong lin

ACTIVE VISION These posters and letterforms, designed by Philippe Apeloig, invite viewers to experience vision as an active process. The principles of proximity, continuation, and closure come into play as viewers spontaneously build wholes out of parts, fill in the gaps between elements, and see white spaces oscillate between figure and ground. This process of witnessing visual conflicts and contradictions yields surprise and delight. Clockwise from upper left: Play Type, poster for an exhibition at the Rosenwald-Wolf Gallery, The University of the Arts, Philadelphia; Xtra Train, poster celebrating the 70th anniversary of the National Railways of France; the letter "Z" from nine typefaces designed by Philippe Apeloig: Coupé Regular, Ali, Octobre, Abf Linéaire Regular, Poudre One, Abf Petit, Ndebele Plain, Abf Silhouette, Izocel; typefaces available from Nouvelle Noir type foundry, Switzerland, https://nouvellenoire.ch. Design by Philippe Apeloig.

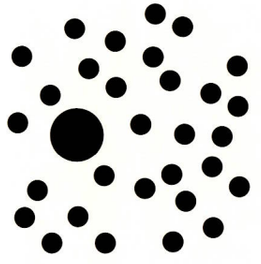




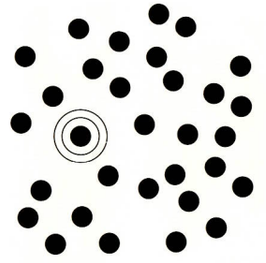
Color



Orientation

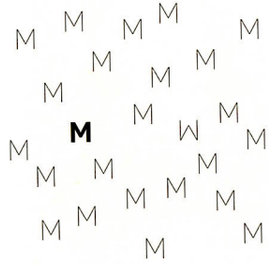


Scale

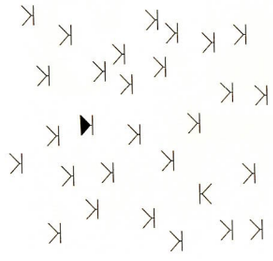


Motion

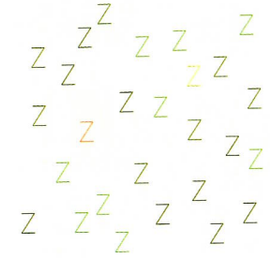
HUNGRY FOR DIFFERENCE The gaze constantly seeks new information. We quickly perceive anomalies in the visual field. Designers use changes in color, size, orientation, and motion to make an element easy to find.



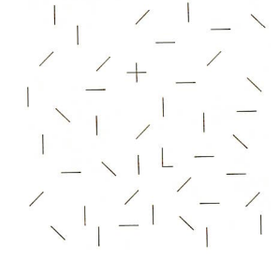
The upside-down M is harder to find than the bold M.



The flipped K is harder to find than the K that's filled in.



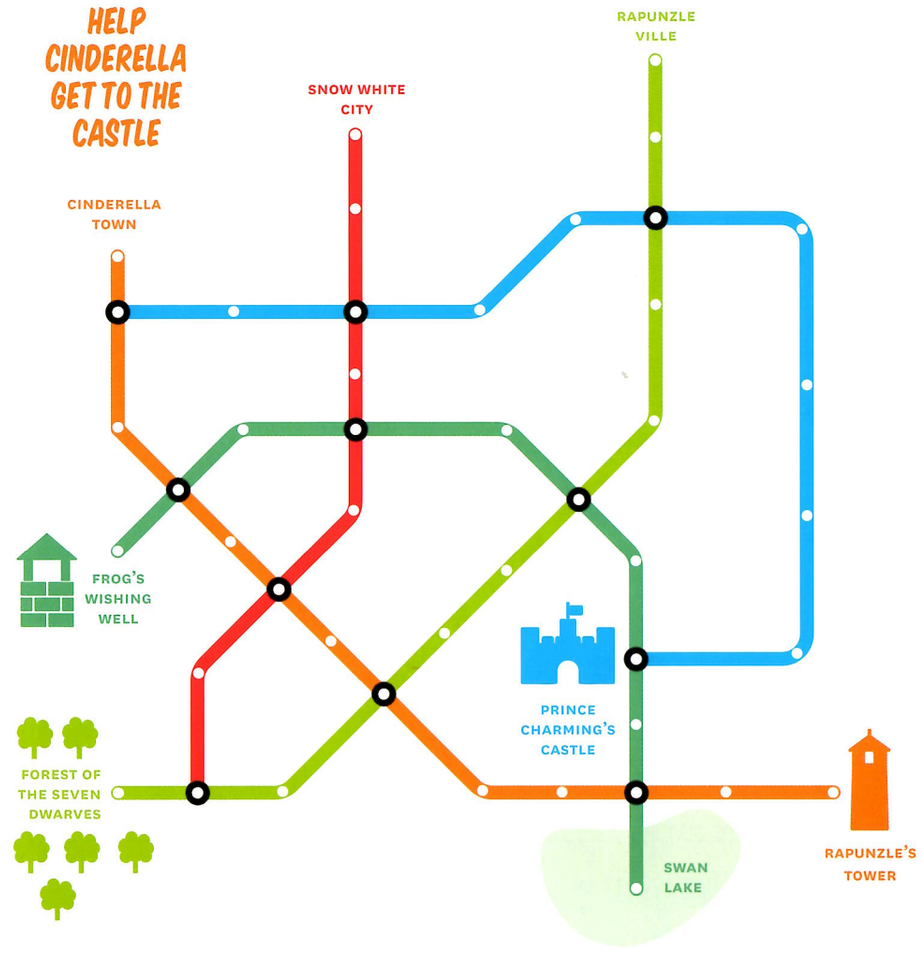
The light green Z is harder to find than the orange Z.



The L is harder to find than the plus sign.

EASY AND HARD Some differences are easier to see than others. Each of these diagrams includes one unique characte that stands out from the crowd and another unique character that more or less blends in. Designers create various relationships of difference and similarit when they work with data, typography, patterns, textures, and other applicatic

Illustrations by Jennifer Tobias; adapt from Colin Ware, *Visual Thinking for Design* (Burlington, MA: Elsevier, 200



NETWORK MAP If Cinderella takes the wrong route, she will end up at Rapunzel's Tower instead of Prince Charming's Castle. Her powers of perception will help her find the right path. Color unifies each of the five train lines (continuation). The large black dots are easy to find and read as a separate plane (similarity). Designers use perceptual principles to create information graphics that are intuitive to read.

READ MORE Johan Wagemans, James H. Elder, Michael Kubovy, Stephen E. Palmer, Mary A. Peterson, Manish Singh, and Rüdiger von der Heydt, "A Century of Gestalt Psychology in Visual Perception, I. Perceptual Grouping and Figure-Ground Organization," *Psychological Bulletin* 138, no. 6 (November 2012): 1172–1217, doi:10.1037/a0029333.

TOOL

Affordance

Action is the essence of storytelling. Designers create cues and pathways that guide the actions of users. Buttons are for pushing, menus are for scrolling, and the pages of a book are for flipping, turning, and marking. An object that triggers an action is called an **affordance**. Some affordances are accidental: a window ledge near a bus stop is a handy place to rest a coffee cup. Many responses to affordances are instinctive. A high cliff affords falling, so people and other creatures stay away from the edge. Other affordances are learned over time. The bars, buttons, and menus on a website or an app borrow imagery from physical objects. Shadows and highlights make these digital fictions seem more physically real—and they invite action from users.

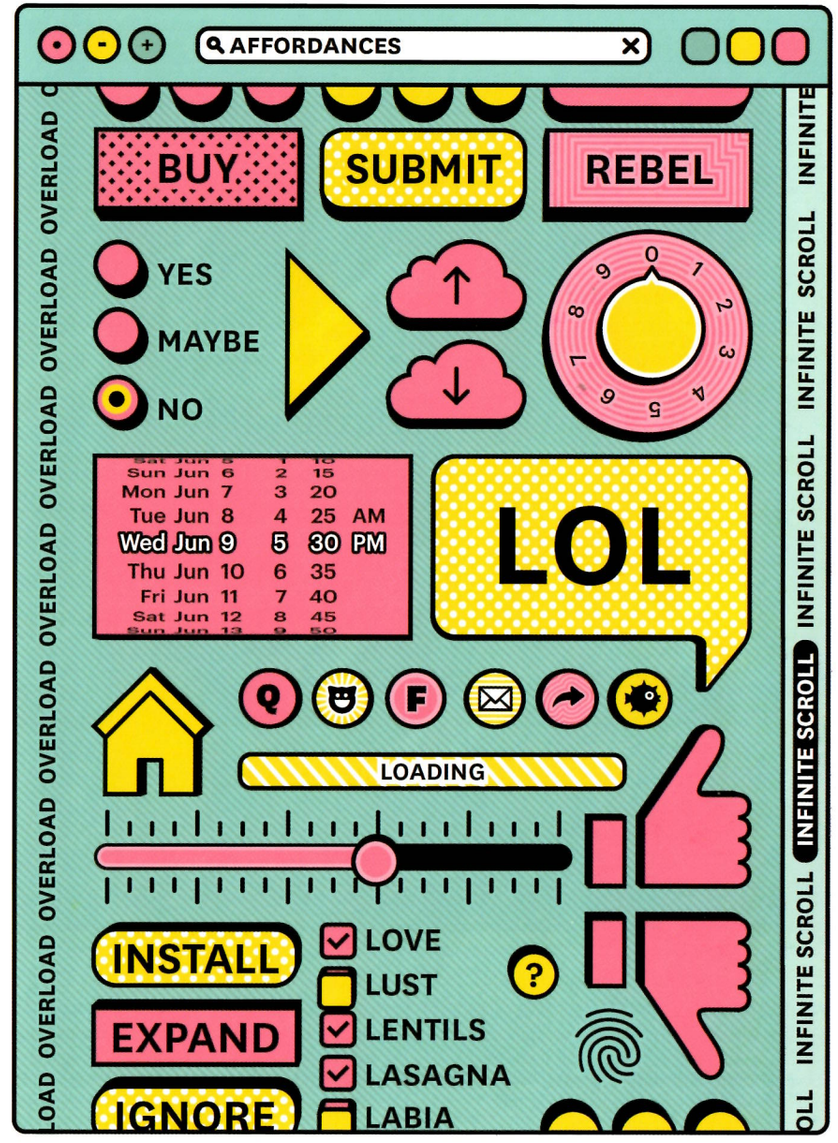
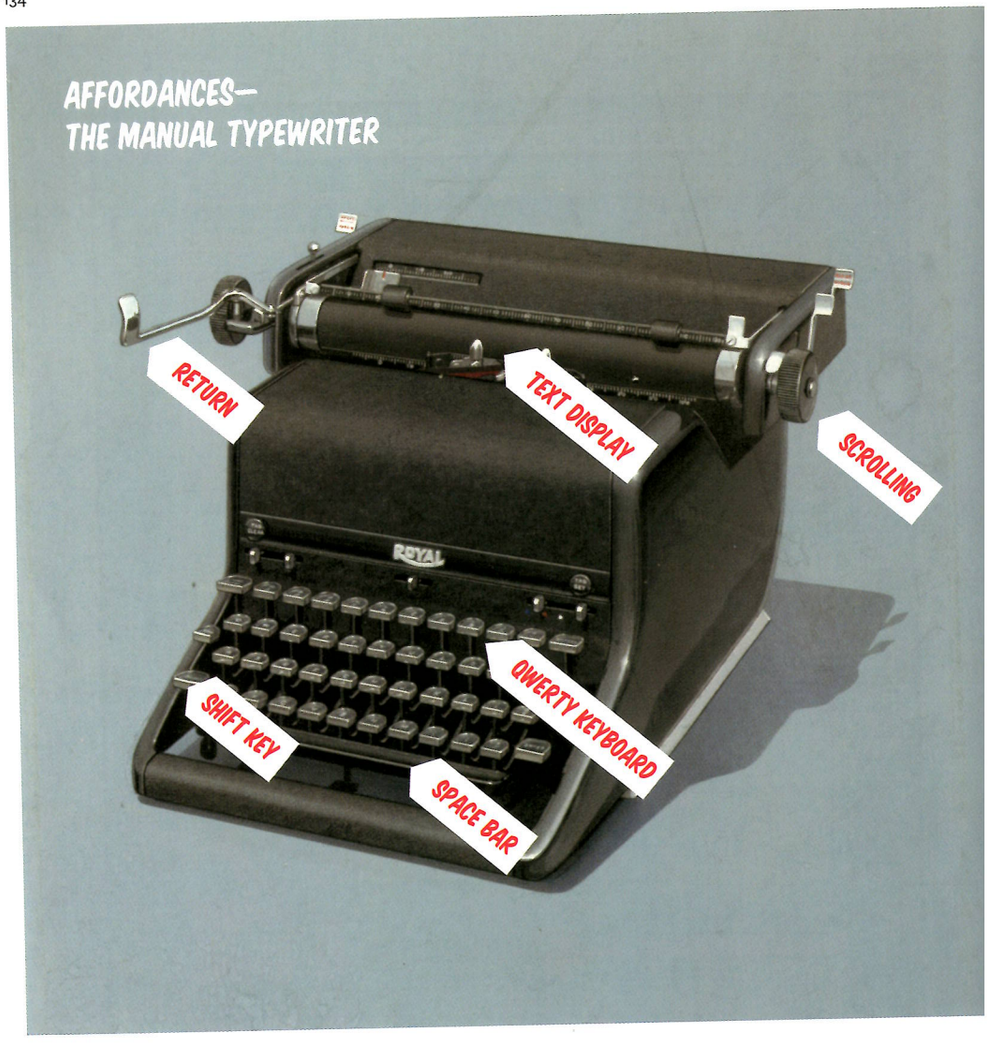
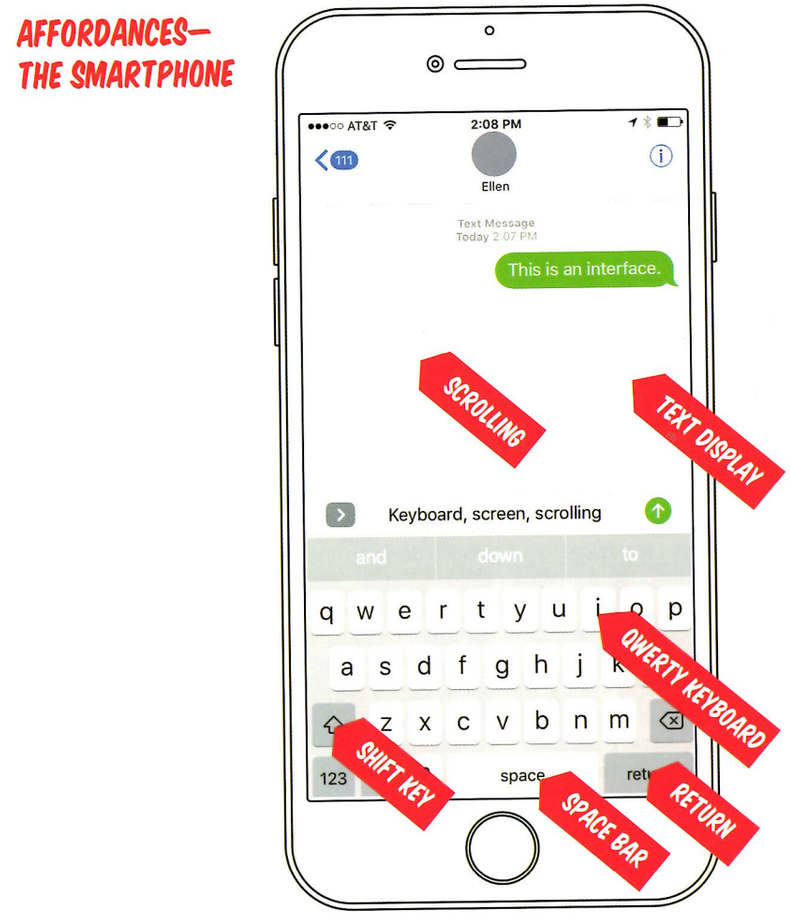


Illustration by Jason Gottlieb



PHYSICAL AFFORDANCES Mechanical controls such as levers, buttons, and wheels are examples of affordances. Their shape, position, familiarity, and graphic markings invite action from users. The typewriter shown here was designed by Henry Dreyfuss in 1944. His design philosophy sought to fit "the machine to the man rather than the man to the machine." Dreyfuss's design preserved features of typewriters that had already been standard for over fifty years, including a cylindrical rubber carriage with a wheel for advancing a sheet of paper up and down, and a lever for finishing a line and advancing the paper the distance required to begin a new line. While many earlier typewriter designs exposed the inner workings c the machine, Dreyfuss and other modern designers preferred to reveal only those parts of the machine that people would interact with. Many devices today adhere to this principle. Drawing, Design for Royal Typewriter, 1944; Designed by Hen Dreyfuss (American, 1904–1972); USA; gouache, pen and blac ink, white chalk, graphite on cream illustration board; 46.4 x 35.9 cm (18 1/4 x 14 1/8 in.); Collection of Cooper Hewitt, Smithsonian Design Museum; Gift of John Bruce; 1993-65-1.



DIGITAL AFFORDANCES The text messaging interface shown here includes a keyboard and a scrolling display. Subtle shadows recall physical keys that can be handled and touched. The first six keys in the top row spell out the word "QWERTY." Back in the early days of mechanical typewriters, the peculiar arrangement of the QWERTY keyboard was believed to prevent keys from jamming by slowing typists down. If a typist was working too fast, the keys could fly up and hit the paper at nearly the same time, creating a tangled mess. Thus the QWERTY keyboard was explicitly designed to prevent optimal performance. Long after such mechanical problems were eliminated, the QWERTY layout stayed in use. Once you have learned to type using this layout, it is difficult to unlearn it and embrace a new one—even though today's devices bear no technical resemblance to their forebears. Despite many efforts at reform, generations of typists have been stuck with this illogical affordance. A smartphone has various physical affordances not found on mechanical typewriters, from the home button to the camera and volume controls, as well as numerous digital affordances that have become new standards.

Affordances

JUST-IN-TIME REPRESENTATION Try this visual test. Look at the icons on the facing page and find the Twitter logo. You may stumble on an eagle or a paper airplane before finding what you are looking for, but you probably hit your target in a second or two.

When searching for something specific—such as a car in a parking lot or a friend's face in a crowd—people actively focus on the task at hand, sifting out irrelevant details. Vision is an active, goal-oriented activity that reserves attention for valued information. The designers of the Twitter logo used distinctive graphics to create a brand identity you can quickly find and act on.

Try the same experiment with the word "dog," which is written somewhere in the following paragraphs. You might stumble on a few false positives along the way ("fog" or "dot"), but despite the hazards, you can quickly find what you are looking for. You draw on your powers of perception and your familiarity with reading and typography to finish the job efficiently.

Computer scientist Dana Harry Ballard calls this process *just-in-time representation*. Ballard is the creator of computerized machines that simulate human vision. In 1985, he helped build a robotic camera that moves rapidly about like the human eye. In fields ranging from cognitive science to artificial intelligence, scientists are modelling vision in order to help computers find meaning in what they see.

Immersed in a fog of competing signals, we simplify what we see in order to distinguish earth from sky, objects from backgrounds, motion from stillness, dashes from dots. Whether searching for the letters *d-o-g* printed on a page or looking for a lost poodle in a busy park, we ignore non-essential stimuli. If a rabid dog suddenly rushed into your visual field, your whole body would react. Your arms would fly up to protect your face. Your shoulders would twist defensively, and you would crouch down to enable leaping out of the way. Sensory details less essential to your immediate survival—such as a plastic bag impaled in a tree or a mosquito biting your neck—would go unnoticed.

Just-in-time representation is a useful phenomenon to keep in mind when designing a simple logo or a complex map. How will users find your symbol in the crowd? How will they make their way through layers of data? Creating strong shapes and clear links and separations among elements helps users find meaning and make sense of the visual field.

Biological vision gears its computational activity closely and sparingly to the task at hand, making the most efficient use of the persisting external scene. ANDY CLARK

FIND IT JUST IN TIME To locate the Twitter logo, you didn't test each image one by one. When the brain is primed to search for particular objects, signs, or colors, we quickly find what we are looking for and ignore the rest. Illustration by Yi Pan.