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# The Tactile Comics of Shapereader

ILAN MANOUACH

## ABSTRACT

Shapereader is a system for tactile storytelling specifically designed for visually impaired readers and makers of comics. Its interface is built on a repertoire of free-floating tactile ideograms intended to provide haptic translations of the semantic features, conceptual functions and attributes of a textual expression. Shapereader works challenge the assumptions and exclusions of graphic literature and explore the conditions for synthesizing language through embodied notions of materiality and performativity. Shapereader situates touch as a conduit for vibrant artistic exploration and demonstrates that comics can address a diverse readership. Promoting an embodied, nonretinal, narrative experience with an ongoing outreach plan, Shapereader has been unfolding worldwide in a variety of formats, contexts and collaborations.

In this article, I focus on Shapereader's early implementation, including *Arctic Circle*, the first systematic attempt to address the sense of touch in the production of comics. *Arctic Circle* is a tactile novel presented as a museum installation, including several work-specific communication boards designed for both sighted and visually impaired visitors. I walk through some of its strategies for translating concepts and elementary semantic features into haptic formations and explore how meaning signification proceeds through clustering and the use of productive chains of signifiers that ultimately propel the text of *Arctic Circle* to a structural instability.

Presented for the first time in 2015, Shapereader is a non-alphabetic system of communication for the production of tactile narrative works that I initially designed and developed for communities of visually impaired readers. Shapereader consists of an expanding repertoire of tactile ideograms (tactigrams) intended to provide haptic equivalents for all semantic features, conceptual functions and textual attributes of a narrative. Unbound by the particularities of ethnic and native alphabets, Shapereader has a language-like capacity to connect tactile symbols with meanings. Its design is based on criteria of simplicity, easiness of memorization and dis-

tinguishability and addresses users regardless of nationality, language, educational level or visual handicap. Shapereader transposes semantic and syntactical structure cognizance to the reader's fingertips and promotes an embodied textual experience. Since its inception, an ongoing outreach plan for raising awareness for the necessities of readership diversification in comics has been unfolding in a variety of formats, contexts and collaborations: contemporary art shows in museums (MUSAC, Castilla [Spain]), community workshops (Tel Aviv, Helsinki, Madrid), artist talks (School of the Art Institute of Chicago, MIS São Paulo) and literature fairs (Shapereader was the official presentation of Belgium at the Frankfurter Buchmesse).

Below I explore *Arctic Circle*, the first tactile comics narrative produced using the Shapereader repertoire. I argue that *Arctic Circle* offers an experience that activates the reader's body and displaces assumptions of visual primacy in comics and comics scholarship. The work demonstrates a tactile equivalent of the comics medium that specifically addresses an audience with visual disabilities that has been historically excluded by comics culture: an experiential translation, a transformation of the experience of graphic narratives.

## OCULARCENTRISM

Tactility occupies an important position in recent technological innovations and the ways humans communicate around the world. More than a considerable factor in economic growth in the majority of business sectors [1], such as the promising tactile Internet in the seamless integration of the Internet of Things, tactility has challenged important distinctions between analog and digital media and has contributed to the making of new social and political subjectivities [2]. In times when contemporary media art is conceptualized in terms of media convergence, partial remediation or embracing processes of embodied cognition of transitional and hybrid textualities, comics are still based on visual primacy. This understanding has been materialized in related scholarly work through a lexicon of spectatorial epistemology;

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expressions such as “perspective,” “insight” and “point of view,” and terms such as “eye,” “vision” and “sight,” when not used in their conventional sense, have been utilized in comics theory to generally account for processes of empirical cognition. Scott McCloud, an influential comics scholar, went as far as to call comics a “mono-sensory medium” [3]. In his visual essay “Understanding Comics,” a centrally positioned Eye of Providence illustrates McCloud’s understanding of the experience of reading comics. Notwithstanding the theological overtones of a world of knowledge open to the comics reader, McCloud, like a large majority of comics scholars, assumes the reader to be a detached, contemplative, disinterested, disembodied or able-bodied entity. As Ian Hague states in his response in *Comics and the Senses*, comics are still predominantly conceptualized within an ocularcentric understanding of “a disembodied interaction between ideas” [4], where physicality is only contingent or contributes minimally to the reading experience, if at all.

Countering the majority of comics scholarship, researchers such as Marco Pellitteri and John A. Bateman have positioned themselves against the reductionist ocularcentric approach. They argue for a performative definition that treats comics as three-dimensional, multimodal objects that exist in time and appeal to the five senses. Likewise, the research group Graphic Medicine is exploring the application of comics in medical education and patient care, demonstrating that comics are increasingly framed as embodied experiences that appeal to a diversification of reading and making subjectivities, thus further challenging able-bodied assumptions about the “disembodied” reader. The medium’s visual primacy can no longer be considered a requisite mode of address and, broadly speaking, visuality’s role as the undisputed conduit of graphic narrative is gradually eroded, expressing a need to rehabilitate an embodied sensibility toward a more inclusive understanding of comics.

## ARCTIC CIRCLE

### Content

*Arctic Circle* is an original tactile novel and the first work built with the Shapereader repertoire. It was originally presented at the International Comics Festival of Angoulême in 2016. Since then, the installation has been accessible on multiple occasions in a long-term setting that invites readers to spend time with the works (Fig. 1). *Arctic Circle* is laser engraved on 57 high-pressure laminated plates that carry a large assortment of carved, tactile ideograms (tactigrams) that stand for the different features of the story, along with information in Unified English Braille. The installation includes additional custom-designed scenographic devices, a set of iron lecterns, archival racks and multiple communication boards that allow the reader to become acquainted with the story’s index. *Arctic Circle* narrates the story of two climatologists in the North Pole who struggle to pursue their field research in amid the conflicting interests of traders, human rights activists and Inuit communities. Their mission is to drill and extract an ice column that carries layers of climate change records in its core. The story’s characters hope that by foren-

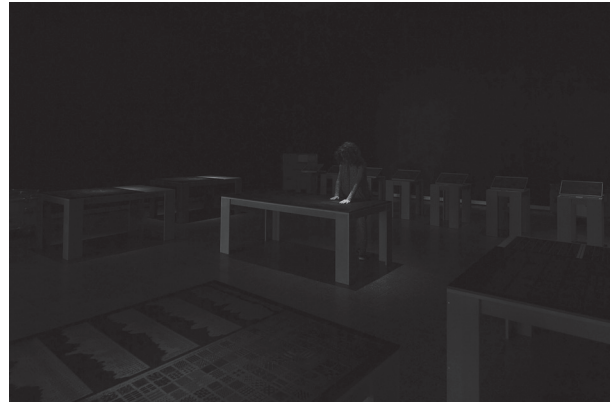


Fig. 1. Shapereader exhibition at MUSAC in 2016. (© Ilan Manouach)

sically deciphering these surface patterns they can form a better historical understanding of global warming. Similarly, readers of *Arctic Circle* are invited to identify by touch the different shapes of the narrative, making *Arctic Circle* a narrative work that thematizes Shapereader’s reading engagement through tactile sensorial inputs (Fig. 2).

### Index

In the *Nature of the Linguistic Sign*, Ferdinand de Saussure defines the sign as a structure wherein arbitrary signifiers are linked to equally arbitrary signifieds, and both are negatively defined by their relations with other parts of the system. Saussure stresses that arbitrariness is a key feature not just of language but of any system of signification that can be studied through semiology. Researchers Klatzky et al., in a highly cited paper that applies Saussure’s principle of semiotic arbitrariness to object identification of tangible graphics by visually impaired subjects, demote the importance of resemblance between the drawing (signifier) and the model (signified). They suggest that “effective graphic aids should eschew simple mimicry of two-dimensional visual displays” [5]; one such example can be found in Blissymbolics, a system of “visualiconic” raised graphics wherein the concept “house” is represented by the simplified, proverbial depiction of a triangular roof. The tactile, pictogrammatic language of

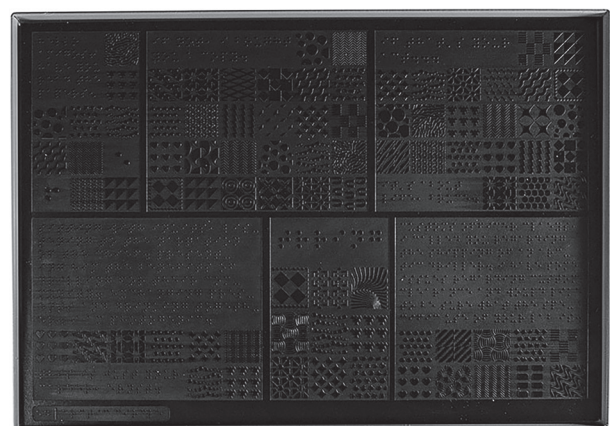


Fig. 2. *Arctic Circle*, plate 54. (© Ilan Manouach)



Fig. 3. Communication boards carrying the index. (© Ilan Manouach)

*Arctic Circle* is not based in iconicity and is not undergirded by a conspicuous relationship between the signifier and the signified. Instead, it uses a nonrepresentational system of signification; the tactigrams' meaning can only be intuited through the available index.

In *Arctic Circle*, the index consists of six handheld tablets, three large exhibition-format communication boards and multiple laminated dibond prints (Fig. 3). These are available in various languages, in both Braille and printed text, and provide visual and tactile information for the elementary semantic features specific to the narrative. In order to be easily traced by beginner Shapereader users, the communication boards contextualize and arrange tactigrams according to their semantic content and narrative function, sorting them into the following categories: *settings*, *characters*, *elements*, *actions* and *affects*. Two additional categories, *graphic* and *textual devices*, provide tactile equivalents for pictorial conventions such as modes of locution (speech, thought balloons, radio emissions) and popular tropes of comics iconography (sweat droplets, movement lines, puffs of smoke). For instance, the *affects* category provides classification and translates 21 different emotional states experienced by the characters, such as *joy*, *fear*, *coercion* or *remorse*. The tactigram design for *affects* consists of the repetition of a basic geometric unit as a core pattern, e.g. a dot, a line, a triangle (Fig. 4). Each affect is introduced in three incremental intensities semiotically translated through the thickening of the core pattern. This results in a total of 63 affects that can be synergetically combined, allowing for a rich description of the characters' emotional states (Fig. 5).

In *Arctic Circle*, tactigrams are distributed in semantic clusters according to an intuitive assumption of contiguity and proximity. Tactigrams are thus connected to an array of quali-

ties and concepts and when compounded together make use of what in cognitive psychology is defined as *combinatorial productivity*: the production of new meaning resulting from the combination of words and syllables [6]. As in conventional linear syntactical structures, the *Arctic Circle* clusters determine the shapes belonging to a semantic group: The tactigram that stands for a specific character is more likely surrounded by others that describe the same character's emotional state, their action and the element(s) they interact with. This configuration allows for a diffused, context-sensitive, open-ended syntactical arrangement in which tactigrams can simultaneously belong to different semantic cells.

For a series of educational activities that run parallel to the *Arctic Circle* installation, I decided to thematize the sign's arbitrariness and open up the signification process to the participants. Workshop participants are invited to work on collective storytelling assignments, and for their experiments they are provided with a custom-made set of shapes that are similar to *Arctic Circle*'s, with one difference; tactigrams come as empty signifiers, and attribution of meaning is entirely arbitrated by the participants themselves. In the beginning, the empty signifiers represent undetermined qualities of signification; they are void of meaning and thus can receive any meaning through collective negotiation. The workshop is an exercise in harnessing Shapereader's potential for a nonrepresentational, free-floating, community-specific system of signification, with the goal not to simply reflect the community's expression in a collectively designed story but to provide the very same genetic material for textual production; a repertoire of empty symbols that can be re-iteratively attributed different meanings and functions according to each community's specific needs, preoccupations and desires. The sign's contingency of arbitrariness actualized through the activation of empty signifiers and free-floating chains of signification propels the "text" to a structural instability that is purposed for community building (Fig. 6). These workshops are an invitation to revalorize tactility and physicality in comics by encouraging a range of intentional, exploratory gestures in the reader's engagement with the tactile narrative work.

#### Modes of Address

*Arctic Circle* argues for a complex practice of intentional, manipulated actions of interpretation, situated outside the dominant sensorial mode of visibility. The work invites the reader to develop techniques of what Matthew Fulkerson describes in his philosophical study as *haptic touch*: "an inherently active and exploratory form of perception" [7]. Lederman and Klatzky, in their research of haptic exploration for 3D common

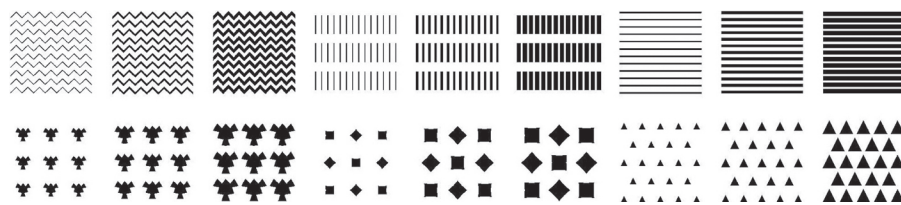


Fig. 4. The gradual thickening of the *affects* tactigram core pattern denotes a change of intensity. (© Ilan Manouach)



I	J	K	L	M	N
	J 01 BOREDOM +	K 01 PAIN +	L 01 REMORSE +	M 01 DISGUST +	N 01 UNEASE +
	J 02 BOREDOM ++	K 02 PAIN ++	L 02 REMORSE ++	M 02 DISGUST ++	N 02 UNEASE ++
	J 03 SHAME	K 03 JOY	L 03 AGRESSION	M 03 HOPE	N 03 PRIDE
	J 04 SHAME +	K 04 JOY +	L 04 AGRESSION +	M 04 HOPE +	N 04 PRIDE +
	J 05 SHAME ++	K 05 JOY ++	L 05 AGRESSION ++	M 05 HOPE ++	N 05 PRIDE ++
	J 06 CONTEMPT	K 06 DECEPTION	L 06 SUSPICION	M 06 SURPRISE	
	J 07 CONTEMPT +	K 07 DECEPTION +	L 07 SUSPICION +	M 07 SURPRISE +	
	J 08 CONTEMPT ++	K 08 DECEPTION ++	L 08 SUSPICION ++	M 08 SURPRISE ++	
	J 09 FEAR	K 09 ANXIETY	L 09 SADNESS	M 09 CURIOSITY	
	J 10 FEAR +	K 10 ANXIETY +	L 10 SADNESS +	M 10 CURIOSITY +	
	J 11 FEAR ++	K 11 ANXIETY ++	L 11 SADNESS ++	M 11 CURIOSITY ++	
I 12 SERENITY	J 12 COMPASSION	K 12 COERCION	L 12 ANGER	M 12 SUBMISSION	
I 13 SERENITY +	J 13 COMPASSION +	K 13 COERCION +	L 13 ANGER +	M 13 SUBMISSION +	
I 14 SERENITY ++	J 14 COMPASSION ++	K 14 COERCION ++	L 14 ANGER ++	M 14 SUBMISSION ++	
I 15 BOREDOM	J 15 PAIN	K 15 REMORSE	L 15 DISGUST	M 15 UNEASE	

L 07 SUSPICION +      L 09 SADNESS  
M 05 HOPE ++      M 08 SURPRISE ++  
J 06 CONTEMPT      J 03 SHAME

**Fig. 5.** The sum of all the Affects category and two cases of translation of emotional states of *Arctic Circle's* characters. (© Ilan Manouach)

objects, have studied various patterns and degrees in the efficiency and rapidity of eight prototypical hand gestures. Classified under the general title of *exploratory procedures* (EPs), these gestures help the subject optimize their apprehension according to given sensory inputs. Each gesture mobilizes an array of distinct sensory receptors in the skin and helps acquire information related to weight, temperature, volume, shape, etc. While exploratory procedures refer mostly to 3D object identification, four of these EPs have applicability in the context of Shapereader and help in conceiving *Arctic Circle* as a productive geography of embodied reading activities:

1. Pressure. According to Lederman and Klatzky, this is “produced by applying torque or normal forces to one part of the object while another part of the object is stabilized” [8]. This gesture, not directly connected to the process of shape identification, is linked to a sensuous understanding of the physical properties of the plate.
2. Lateral motion. The hand laterally brushes an object to determine a general surface texture. This move-

- ment is usually observed to be the reader’s initial approach to *Arctic Circle's* tactile plate. This gesture informs the user about the general feel and size of the plate and provides some intuition about the layout, the number of panels, the overall quantity of text, etc.
3. Contour following. The fingers follow the edges of tangible shapes. This gesture allows for a more precise method of exploration, a partial shape identification, and when the reader is familiar with the index it helps them intuit parts of the narrative.
4. Enclosure. This is when the fingers are molded closely to the tactigram’s surface for a more detailed exploration, i.e. when in need of disambiguating between two contingent shapes.

While an argument for or against intersensory equivalence is beyond the scope of this paper, exploratory procedures resonate with different modes of vision in eye-tracking studies in the reading of comics: The broad hand movements of “lateral motion” resemble the reading subject’s global state of attention to the tabularity of a comics page [9], while the detailed exploration in “enclosure” could be a tactile translation of foveal vision and local attention focus when visual detail is of primary importance.

The aforementioned exploratory procedures can be productively combined. For instance, after activating the entirety of the hand’s skin surface in order to intuit general information about a plate’s layout (lateral motion), the reader can engage the individual fingers, which contain more densely populated receptors (contour following) and thus vary their contact approach by simply applying different degrees of pressure (pressure) in order to extract specific information from different microgeometric tangible features (enclosure).



**Fig. 6.** Community workshop using custom-made sets of tactigrams. (© Ilan Manouach)

## Interface

Undergirded by the visual primacy hypothesis, the main argument against nonretinal comics asserts the centrality of conventional craftsmanship (drawing, inking, coloring, etc.) as a defining feature of comics as a medium. Craft is undoubtedly a distinctive trait of professional integrity, but the argument suffers from a narrow medial perspective, one that frames socially constructed, culturally activated or popular representations of an artform as being constituent traits of a medium. This conceptualization of comics stems from structures that might have been constraints inherent to the original forms of completion (early printing technologies, newspaper distribution, etc.); although their functionality is no longer essential, they are still conventionally “required.”

Counter to this definitional fixity and following a paradigm developed in contemporary art praxis theory, scholars in comics studies such as Simon Grennan and Benoît Crucifix have defined comics craft in social, evolutionary and dynamic terms in order to embrace a diverse register of inscription techniques and “deskilling” approaches. Moreover, this is equally contested by a diverse range of counterexamples, such as in the recently published collective reader *Comics and Abstractions: Narration by Other Means*, and definitely by a number of multisensory experiments in comics. In an increasing number of contemporary comics, drawing is not a constitutive part of the practice, such as in narrative works made exclusively from image libraries or commissioned in an industrial manner through the combined work of hundreds of unskilled participants, or where the visual is not dominant, such as in audio comics or “augmented” comics with edible and olfactory features.

In another strand of argumentation, the concept of *intersensory equivalence*—according to which different sensory modalities can produce, extract and store the same sort of information—can inform a nonvisual, all-tactile modality in comics. There are indications that salient structural features, usually manifested through raised outlines, can and do stand for the representation of “objective” shapes that are intersensorially equivalent with their visual referents. Experiments with congenitally blind children [10] and subsequent experiments with sighted participants with no prior experience of raised graphics [11] have corroborated the hypothesis of a partial overlap according to which there is a structural similarity in the depiction of objects that can be equally perceived through vision and haptics. While comparisons with visual counterparts and more conventional comics are implicit and inevitable, a *native* tactile work such as *Arctic Circle* can deliver a narrative experience in comics that is similar in intensity and effect to, but also different from, visual comics.

### ARCTIC CIRCLE: A TRANSCREATION OF THE COMICS MEDIUM

There is little consensus among scholars on whether comics is a language, but there is relative agreement that it is a sequential system of communication that consists of both linguistic and nonlinguistic signs [12]. In the anthology *Comics in Translation*, editor and researcher Federico Zanettin describes comics

as syncretic semiotic environments where multiples systems of signification “are co-present and interplay at different levels and are culturally determined along dimensions of space and time” [13], while researcher Gonçalves de Assis, in his study on comics translation, stresses with multiple illustrations the negotiated creativity that goes into most processes of adaptation in mainstream comics [14]. The multimodal overlap that can be found in comics means that “translation” cannot easily account “for processes of transfer where verbal and visual language cannot come apart” [15] or for works that are “rather prone to present the two nonsynchronously” [16]. Similar to comics, textual works that rely on nonverbal communication, such as internationalist concrete poetry, French lettrism, constrained literature in OuLiPo and contemporary traditions of conceptual and uncreative writing where the material substrate contributes entirely to the understanding of the work, intensify the challenges faced to a lesser degree with more conventional types of literary translation.

Some researchers have proposed using the term “transcreation” for works that require an extensive adaptation of verbal or visual material when adapted for new target audiences. While the term “transcreation” is also popular in the globalized corporate culture of advertising, it was originally useful in describing a postcolonial conceptualization of the poetics of translation, such as in the works of Haroldo Dos Campos and in the general context of Brazilian concrete poetry [17]. If we consider that comics can be understood as different systems of communication that operate through a sequential unfolding of building blocks with their own vocabulary, grammar and syntax, we can imagine a tactile system of communication based on the combination of elementary tactile stimulations that serve the same narrative functions as their visual counterpart. *Arctic Circle*, a work specifically designed for a visually impaired readership, is more than a tactile replacement or a more or less faithful translation of comics in a tactile form. As I have demonstrated, *Arctic Circle* is a transformative re-creation of graphic narratives and established traditions and forms in comics. It emphasizes a sensorial epistemology that takes the body into consideration in its acknowledgment of the sensuous pleasure of cognizance and the particular gratification that derives from the awareness of tactile subtleties and nuances. Informed by physical intentional action, the work expands the possibilities of the comics medium and opens up the concept of graphic narrative in order to encompass “a complex, interactive and multimodal experience, one that relies on both perceptual and memory abilities” [18]. From its design, interface and community engagement, *Arctic Circle transcreates* comics in the tactile sensorial and experiential realm and challenges the medium’s assumptions about how comics should be (printed and flat), how they typically address their reader (through vision) and who the reader is assumed to be for this exchange to happen (able-bodied and sighted).

## CONCLUSION

*Arctic Circle* brings into focus certain material aspects of an original medium materiality in comics. It performs a conceptual shift to embodied forms of interactions that is elaborated

through the tactile-iconic formation of the project's index, the informational density of its diagrammatic language and the extension of traditional modes of craft using inscription methods from contemporary printing technologies. In contrast to the majority of comics studies literature, the tactile comics narrative of *Arctic Circle* argues for a shift to a model of embod-

ied cognition. Overall, Shapereader and *Arctic Circle* displace the medium's assumptions about visual primacy in comics and propose an unconventional mode of address for comics that activates the reader's corporeal sensorium by producing knowledge tied up with the workings of the body through a set of physical and intentional exploratory procedures.

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