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# Metaphor Cards: A How-to-Guide for Making and Using a Generative Metaphorical Design Toolkit

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**Abstract**

Generative metaphorical design while rich in possibility, is not easy to do. In response, we have developed Metaphor Cards, a toolkit for supporting metaphorical design thinking. In this pictorial, we introduce Metaphor Cards and provide a **HOW-TO-GUIDE** for design researchers to make and use their own sets. To demonstrate this process, we provide a **CASE STUDY** documenting our development of a set of Metaphor Cards for designing information systems for international justice. We conclude with reflections on the benefits and limitations of the Metaphor Card toolkit and suggestions for how to adapt Metaphor Cards to other domains and technologies.

**Authors Keywords**

Design method; design toolkit; how-to-guide; international justice; metaphor cards; metaphorical design; multi-lifespan design; value sensitive design.

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

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**Metaphor Cards**  
A Generative Design Toolkit

**THEATRE**

photo credit: <https://pxhere.com/en/photo/940285>

*"[The ICTR] is important for the people of Rwanda ...it shows that the international community is interested in what happened to them, interested in their welfare. It's symbolic in another sense that the international system because of its nature can't really prosecute everybody, so you have to concentrate on a few symbols of those offenses. ...Pick them out, make sure they are prosecuted. And in that way, you can then send the message to people of the same status who are in other jurisdictions, a message of deterrence that accountability even at that level is possible."*

— Hassan Jallow, ICTR Prosecutor

**THEATRE**

"There is no culture that has not had a theatre in some form, for theatre is the art of people acting out—and giving witness to—their most pressing, most illuminating, and most inspiring concerns. Theatre is at once a showcase and a forum, a medium through which a society displays its ideas, fashions, moralities, and entertainments, and debates its conflicts, dilemmas, yearnings, and struggles.

...Theatre is above all, a *living* art form: an art that continually forms before our eyes and is continuously *present* to an audience even as it is presented by its actors."

— Robert Cohen, Playwright

**BRIDGING CONCEPTS:** Audience, Conflict, Symbolic Action

source: <http://www.tribunalvoices.org/voices/video/270> source: Cohen. 2013. Theater Brief: Tenth Edition

BACKGROUND

# metaphorical thinking

Metaphors provide new ways of seeing. They create opportunities to view objects or phenomena as something different. According to Lakoff and Johnson, “Metaphor is principally a way of conceiving of one thing in terms of another, and its primary function is understanding” [8, p. 36].

*Tenor is “the underlying idea or principal subject” [15]*



ANATOMY OF A METAPHOR

# THE MIND IS A MACHINE.

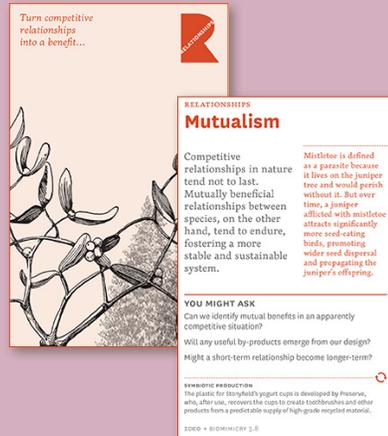
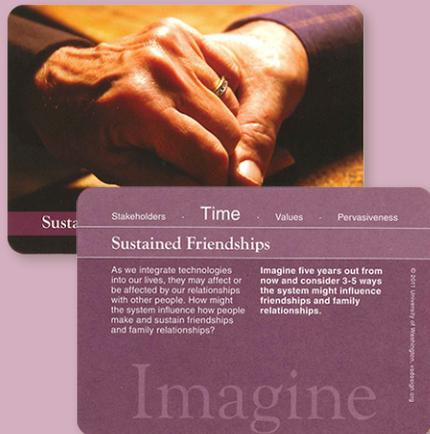
*Vehicle is the secondary subject which provides a figurative description of the tenor [15]*



The literature surrounding metaphor stretches from philosophy [15], linguistics [8], psychology [12], to design [10]. In HCI, metaphor often refers to users’ understanding of computers and applications [1, 10, 11], and is concerned with how similarity leads to ease of use. Seeing the user interface (tenor) as a desktop (vehicle) is a classic example of such metaphor. More recent work considers alternative network metaphors to envision speculative Internet of Things products and services [14].

We consider metaphor as a generative design tool. We do so by inviting designers and stakeholders to employ metaphorical thinking to imagine future technologies and ways of being. Generative metaphor works by connecting previously disassociated domains to generate new ideas.

That said, generative metaphorical design is not easy. Previous studies, for example, highlight how metaphors “resisted mapping,” and while there may be an initial “unarticulated perception of similarity” [16], tapping into metaphors’ generative potential means making similarities and differences explicit. In response to these challenges, we have developed Metaphor Cards to support generative metaphorical design.



## cards as design tools

Cards introduce information and sources of inspiration in compact, tangible, and easily recognizable forms. As a genre of design toolkits, cards serve as shared objects among diverse participants, allowing for playful and collaborative exploration of ideas [4, 9].

In particular, we were inspired by the VSD Envisioning Cards (left, [18]), IDEO Nature Cards (middle, [5]), and Open Lab Refugees and HCI SIG cards (right, [17]), which tend to present inspirational images, challenging design situations, and interesting conversation topics.

ABOUT THIS PICTORIAL

# a how-to-guide for developing metaphor cards

Our primary aim with this pictorial is to enable design researchers to develop and use their own Metaphor Cards. As Donald Schön wrote, “the making of generative metaphor involves a developmental process. It has a lifecycle.” [16, p.142]. Mindful of this developmental process, we use the form of a **HOW-TO-GUIDE** to present a four-step process. In each step, we provide a brief rationale and describe key elements to consider in the process of making and using Metaphor Cards.

- #1 **familiarize:** capturing rich experience
- #2 **metaphorize:** composing a set of generative metaphors
- #3 **concretize:** making metaphor cards
- #4 **explore:** bringing metaphor cards into design research

CASE STUDY

## developing a set of metaphor cards for international justice

Over the past decade, we have worked in Rwanda, the United States, and The Hague on envisioning information systems for international justice. In that context, we explored the use of metaphorical design as a part of multi-lifespan envisioning [18] and multi-lifespan co-design [19]. Through that work, we recognized the need for tools to scaffold metaphorical design thinking. In the **CASE STUDY** portion of this pictorial, we share insights from our particular experience developing a set of Metaphor Cards for international justice. Here we report only on our development of the card set. We leave reporting on their use in workshop settings for another time.



Fig. 1 developing a set of metaphor cards for international justice ©Daisy Yoo

## HOW-TO GUIDE #1

**familiarize***capturing rich experience*

Generative metaphor refers to a particular kind of *seeing-as*, the “carrying over” of perspectives from one experience to another [16, p. 137]. The first step in composing Metaphor Cards is to become deeply familiar with the project domain in order to “capture the experienced richness of the situation” [16, p. 160]. To do so, designers and research can leverage established user-research methods such as contextual inquiry [2], field studies and participant observation [7, 13]. Participants should be able to both connect with generative metaphors and understand how Metaphor Cards are used.

**Elements of Metaphor.** How well participants can explore with a metaphor depends on how well they understand each element—the tenor and the vehicle [16]. That is, participants cannot see the tenor through the lens of a vehicle if they do not have enough experience or understanding of the vehicle itself.

**Experience of Metaphor.** Designers should prepare participants to engage in generative metaphorical design. If participants normally experience metaphor as a means of description or explanation, they may expect straightforward vehicles more readily relatable to the tenor. Instead, metaphorical design thinking asks participants to engage with metaphor as a tool for idea generation.

## CASE STUDY

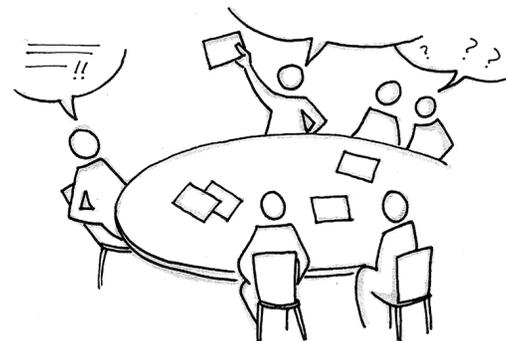
**understanding our tenor: international justice**

Fig. 2 ©Daisy Yoo

*Listen to stories.*

*Over the years, we have listened to stories from personnel from the International Criminal Tribunal for Rwanda (ICTR) as recorded in the Voices from the Rwanda Tribunal (VRT) [19]. We also listened to Rwandan adults and youth about their ideas of justice [21, 22]. Together they pointed us to concepts such as healing, heritage, and symbolic action.*

*Solicit feedback from experts.*

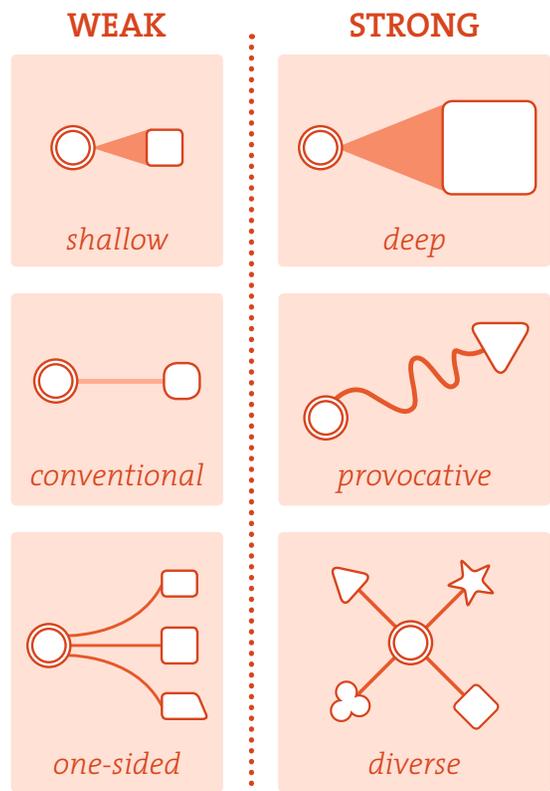
*Once we had a prototype of the international justice Metaphor Cards, we shared them with five experts in law and human rights. They told us how they perceived the metaphors from within a legal worldview. For example, they told us lawyers use metaphors to argue, not to imagine with.*

HOW-TO GUIDE #2

# metaphorize

*composing a set of generative metaphors*

Each individual metaphor should provide a unique perspective to help participants reimagine what the tenor could be. While individual metaphors “select for attention a few salient features” [16] and mute others, composing a set allows participants to examine the tenor through multiple lenses. Sets of metaphors should complement one another.



○ TENOR □ VEHICLE

**Deep Metaphors** are immersive. Working within a deep metaphor, participants are able to explore a broad range of themes connecting the tenor and the vehicle. They are able to embrace the lens offered by the vehicle to explore and make sense of the tenor.

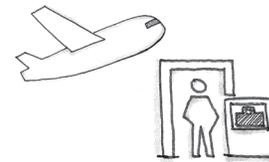
**Thought Provoking Metaphors** challenge participants to see the tenor in new ways. Provocative metaphors avoid conventional description of the tenor. Instead, they leverage seemingly arbitrary vehicles to provoke critical reflection on the tenor.

**Diverse Metaphors** complement each other. Sets of diverse metaphors avoid vehicles with overlapping themes and do not push participants toward similar ideas. They offer participants a variety of opportunities for *seeing-as* to generate new perspectives, ideas, and explanations.

CASE STUDY

## generative metaphors for international justice

### WEAK



*The AIRPORT metaphor only led to surface similarities such as security checkpoints.*



*The SCALE metaphor was too conventional.*



*The MUSEUM and LIBRARY metaphors shared similar themes.*

### STRONG



HOSPITAL



MUSEUM



THEATRE



COMPANY



STARTUP



LABORATORY

*Our final set was composed of six generative metaphors designed for deep exploration and critical reflection across a diverse range of vehicles.*

Fig. 3 ©Daisy Yoo

HOW-TO GUIDE #3

# concretize

## *making metaphor cards*

Metaphor Cards should be supported with content that helps make metaphors concrete for participants. Tenor quotes, vehicle definitions, vehicle images, and bridging concepts work together to build this connection.

**Tenor Quotes** are intended to provide a domain specific anchor for participants.

**Vehicle Definitions** should come from sources that are commonly shared and accessible. Potential sources include introductory textbooks, international organizations or agreements, and industry standards.

**Vehicle Images** should make each card distinct and unique. Images should be familiar to most participants and serve as appropriate reference points for the vehicle and bridging concepts.

**Bridging Concepts** are a critical piece of metaphorical design [10, 11]. They are explicit concepts (similarities) that connect the tenor to the vehicle. Find 3–5 bridging concepts for each card. The list should not be exhaustive. Bridging concepts are an invitation and starting point for exploring the metaphor, not where participants should end. The tenor quotes, vehicle definitions, and vehicle images all should support the bridging concepts.

CASE STUDY

### making metaphor cards for international justice



Fig. 4 ©pxhere

*Avoid images that reinforce stereotypes.*



Fig. 5 ©pxhere

*Our choice of vehicle image for the STARTUP metaphor card.*

*Find tenor quotes and vehicle definitions that come from voices perceived as expert or authoritative.*

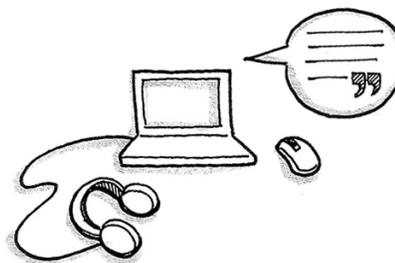


Fig. 6 ©Daisy Yoo

*This serves two ends—it further connects the metaphor to the bridging concept and adds legitimacy to the process. For tenor quotes, we drew on interviews with ICTR personnel [19]. For vehicle definitions, we drew on published statements by established organizations (e.g., the World Health Organization).*

CASE STUDY

# close-up of the international justice metaphor cards

**Color Bar.**  
Each card was coded with a color grabbed from the dominant color palette of the vehicle image.

**Vehicle Image.** We focused on finding images that are easily recognizable and inspiring.



**MUSEUM**

Title.

Image Credit.

CASE STUDY

# close-up of the international justice metaphor cards

**Tenor Quote.** For each metaphor, we selected a relevant quote from the Voices from the Rwanda Tribunal interview collection [16].

**Vehicle Definition.** We searched the literature to find a brief working definition of each vehicle.

**Author Info.**  
We included author name and title for credibility.

**Bridging Concepts.**  
For each card, we selected three bridging concepts.

*“Wherever digital media survive, people will know that witness’s [story], that witness will be able to speak ...The story, the history of that particular small event, in that particular small event to a small farmer in a small part of an anonymous piece of land, will live on and nobody will be able to gainsay that particular event.”*

— Everard O’Donnell, ICTR Deputy Registrar

## MUSEUM

“Museums are centres for conservation, study and reflection on heritage and culture. Today they are defined as ‘non-profit-making, permanent institutions in the service of society and its development, and open to the public, which acquire, conserve, research, communicate and exhibit, for purposes of study, education and enjoyment, material evidence of people and their environment.’

They bear out a relationship with the past that attaches value to tangible traces left by our ancestors, and therefore plays a key role in fostering social cohesion.”

— UNESCO, Office in Kabul

**BRIDGING CONCEPTS:** Artifacts, Heritage, Stories

source: <http://www.tribunalvoices.org/voices/video/553>

source: <http://www.unesco.org/new/en/kabul/culture/museums/>

Source Credit

Here we offer a blank Metaphor Card template for you to use to make your own set of Metaphor Cards. You will notice areas for an image, title, quotation, definition, and bridging concepts. Cut along the outline and fold the sheet in half. Fill out each area appropriately to create the cards in your set.

**Title your card.** The title of your card is the name of your vehicle.

**Select an image.** Draw an image that helps concretize your vehicle.

**Select a definition.** Find or write a definition that helps the participants understand your vehicle.

**Choose bridging concepts.** Add 3–5 bridging concepts that invite participants to connect with and explore your metaphor in more depth.

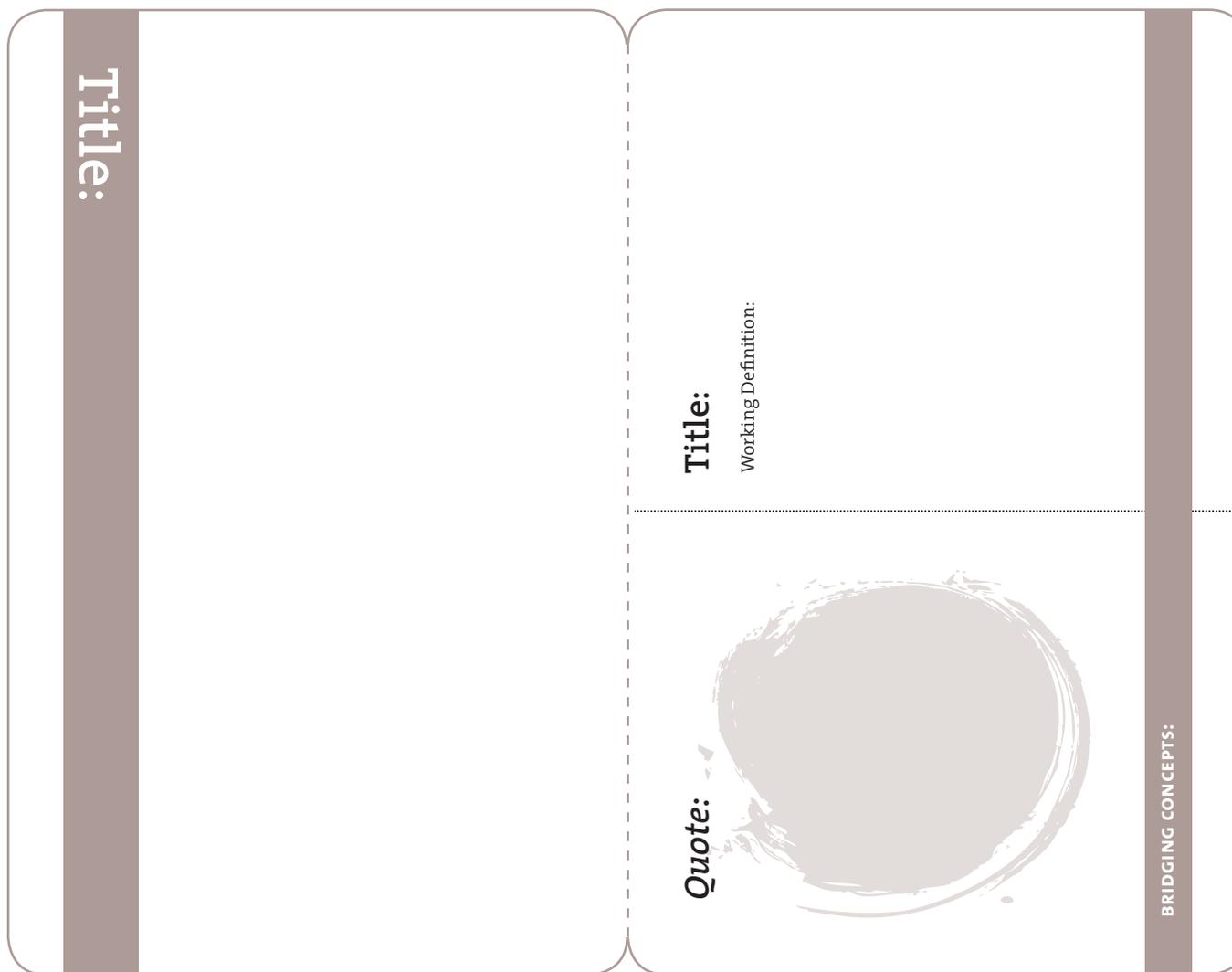
**Select a quote.** Find a quote that helps participants understand your tenor in light of the selected bridging concepts.

A PDF version of the International Justice Metaphor Cards can be found at:

[www.vsdesign.org/publications/pdf/metaphorcards\\_internationaljustice.pdf](http://www.vsdesign.org/publications/pdf/metaphorcards_internationaljustice.pdf)

**DO IT YOURSELF**

**make your own metaphor cards**



## HOW-TO GUIDE #4

## explore

*bringing metaphor cards into design research*

Metaphor Cards are versatile and can be integrated with diverse types of design research practices such as co-design. There are at least five types of probing questions that can be used to scaffold generative metaphorical design and Metaphor Card use.

**1. Organization.** Organizational questions invite participants to consider the mission of the specific organization or project domain [6]. Participants are asked how missions shift when viewed through a particular metaphor, and how this shift changes the descriptions and priorities of their work.

**2. Stakeholders.** Direct and indirect stakeholders [3] change as participants view domains and organizations through different lenses. Stakeholder questions identify how different metaphors highlight certain groups and hide others.

**3. Staff.** Questions oriented toward staff tasks ask participants to consider how staff roles and identities change when viewed through the lens of a particular metaphor [6]. This helps reveal the range of duties and responsibilities staff have within an organization.

**4. Future.** Future-oriented questions invite users to consider the longer-term implications of each metaphor [22]. Longer-term considerations support the generative aspect of metaphorical design. It creates space for participants to speculate and imagine within the metaphor by moving outside constraints of the everyday [1, 10, 11].

**5. Muted Aspects.** Each Metaphor Card calls attention to specific aspects of the tenor. Highlighting some areas, however, can lead to ignoring or distorting other important details [8, 16]. Asking what is muted by a metaphor creates an opportunity for participants to notice these trade-offs.

## CASE STUDY

## multi-lifespan co-design

1. PICK A METAPHOR.  
*International Justice* seen as \_\_\_\_\_ :

What is the the court's mission?	Who are the key stakeholders?		What are the main court staff tasks?
1	<i>International Justice</i>	Metaphor	3
What longer term aspects does the court need to consider 5, 10, 20 years from now?			What aspects are muted by using this metaphor?
4			5
Team:			Date:

*Use Metaphor Cards for co-designing a future information system.*

*We created metaphorical design worksheets [20] to support co-design, including the following questions:*

- 1. What is the organization's key missions?*
- 2. Who are the key stakeholders?*
- 3. What are the main staff tasks?*
- 4. What longer term aspects are needed to be considered—5, 10, 20 years from now?*
- 5. What aspects are muted by using this metaphor?*

## REFLECTIONS

## metaphor cards as a generative design toolkit

We have provided a **HOW-TO-GUIDE** for designers and researchers to develop Metaphor Cards specific to their particular use cases. Though we demonstrate the cards with a **CASE STUDY** of designing information systems for international justice, Metaphor Cards can be used in a range of contexts and domains.

For example, it is possible to imagine how Metaphor Cards could support designers working with policy makers interested in urban public transportation. A metaphor card titled *MAZE* could include a quote from a transportation expert noting the complexity of public transit systems and include bridging concepts like *complications*, *navigation*, and *wrong turns*. Another card titled *MENU* could emphasize the range of options available in public transportation and use bridging concepts such as *choice*, *service*, and *ability to pay*.

Metaphor cards concerned with domestic internet-of-things (IoT) such as home assistants might include a card titled *SPY*, and use bridging concepts such as *disguise*, *mystery*, and *watching*. A card titled *PET* might highlight how people anthropomorphize and form attachments with devices. The card could use bridging concepts like *companion*, *family*, and *responsibility*. Used with transit, IoT, or other contexts, Metaphor Cards would prompt rich feedback and ideas from participants to inform future designs and technology.

**Benefits.** Metaphor Cards invite exploration and ideation while solving some of the challenges inherent to metaphorical design thinking. Specifically, the difficulty of engaging participants with an abstract concept like metaphor, as well as the challenge of shifting participants' experience of metaphor from descriptive to generative.

Metaphor Cards create a shared understanding of the metaphor's vehicle, make connections between the vehicle

and tenor explicit, legitimize the metaphor within a specific domain, and offer bridging concepts to support initial explorations with the metaphor. In addition, Metaphor Cards build shared language among participants and designers to point to certain issues, concerns, activities and considerations. Metaphor Cards are also versatile and can be used with other design research practices (e.g., co-design).

**Limitations.** Though Metaphor Cards help structure generative metaphorical design, metaphor is abstract. Participants could still struggle to see the connection between their daily activities and the ideas they generate using Metaphor Cards. The content participants create with Metaphor Cards is also subject to interpretation and risks losing participants' intended meaning. It is not clear how to ensure designers properly interpret participant contributions within the open exploratory environment enabled by metaphor.

**Open Questions.** The Metaphor Cards were designed to use linguistic metaphor to support early stage design work. Questions concerning how to further integrate Metaphor Cards into the design process, as well as how to adapt the cards to other types of metaphor present a range of open questions. How could Metaphor Cards (or a tool like them) be used further downstream in the design process? As designs mature, how could Metaphor Cards serve as touch stones for designers to return to previous ideas and motivations? How could Metaphor Cards be adapted to use visual metaphor?

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## References

1. Alan F. Blackwell. 2006. The reification of metaphor as a design tool. *ACM Transactions on Computer-Human Interaction* 13, 4: 490–530. <http://doi.acm.org/10.1145/1188816.1188820>
2. Hugh Beyer, and Karen Holtzblatt. 1997. *Contextual Design: Defining Customer-centered Systems*. Morgan Kaufmann Publishers, Burlington, MA.
3. Batya Friedman, Peter H. Kahn Jr., and Alan Borning. 2006. Value Sensitive Design and information systems. In *Ping Zhang and Dennis F. Galletta (eds.), Human-Computer Interaction In Management Information Systems: Foundations*. M.E. Sharpe, Inc, 348–372.
4. Batya Friedman, and David G. Hendry. 2012. The Envisioning Cards: a toolkit for catalyzing humanistic and technical imaginations. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*, 1145–1148. <http://doi.acm.org/10.1145/2207676.2208562>
5. IDEO. 2014. *Nature Cards*. Available at: <https://www.ideo.com/post/nature-cards>
6. Finn Kensing, and Kim Halskov Madsen. 1992. Generating visions: future workshops and metaphorical design. In *Joan M. Greenbaum and Morten Kyng (eds.), Design At Work: Cooperative Design Of Computer Systems*. L. Erlbaum Associates Inc., 155–168.
7. David R. Krathwohl. 2009. *Methods of Educational and Social Science Research: The Logic of Methods*. Waveland Press, Long Grove, IL.
8. George Lakoff, and Mark Johnson. 2003. *Metaphors We Live By*. University of Chicago Press.
9. Andrés Lucero, Peter Dalsgaard, Kim Halskov, and Jacob Buur. 2016. Designing with cards. In *Panos Markopoulos, Jean-Bernard Martens, Julian Malins, Karin Coninx, and Aggelos Liapis (eds.), Collaboration in Creative Design*. Springer International Publishing Switzerland, 75–95.
10. Kim Halskov Madsen. 1994. A guide to metaphorical design. *Communications of the ACM* 37, 12, 57–62.
11. Kim Halskov Madsen. 2000. Magic by metaphors. In *Proceedings of DARE 2000 on Designing Augmented Reality Environments (DARE '00)*, 167–169.
12. Allan Paivio and Mary Walsh. 1998. Psychological processes in metaphor comprehension and memory. In *Andrew Ortony (ed.), Metaphor and Thought*. Cambridge University Press, Cambridge, 307–328.
13. Michael Quinn Patton. 2015. *Qualitative Research & Evaluation Methods: Integrating Theory and Practice: The Definitive Text Of Qualitative Inquiry Frameworks And Options*. SAGE Publications, Inc., Thousand Oaks, CA.
14. James Pierce, and Carl DiSalvo. 2017. Dark Clouds, Io&#!+, and [Crystal Ball Emoji]. In *Proceedings of the 2017 Conference on Designing Interactive Systems (DIS '17)*, 1383–1393. <http://doi.acm.org/10.1145/3064663.3064795>
15. Ivor Armstrong Richards. 1965. *The Philosophy of Rhetoric*. Oxford University Press.
16. Donald Schön. 1993. Generative metaphor: A perspective on problem-setting in social policy. In *Andrew Ortony (ed.), Metaphor and Thought*. Cambridge University Press, 137–163.
17. Reem Talhouk, Syed Ishtiaque Ahmed, Volker Wulf, Clara Crivellaro, Vasilis Vlachokyriakos, and Patrick Olivier. 2016. Refugees and HCI SIG: the role of HCI in responding to the refugee crisis. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI '16)*, 1073–1076. <http://doi.acm.org/10.1145/2851581.2886427>
18. Value Sensitive Design Research Lab. 2011.

- Envisioning Cards*. Available at: <http://www.envisioningcards.com>
19. Voices from the Rwanda Tribunal. Website. Retrieved September 18, 2017 from <http://www.tribunalvoices.org>
  20. Daisy Yoo, Alina Huldtgren, Jill Palzkill Woelfer, David G. Hendry, and Batya Friedman. 2013. A value sensitive action-reflection model: Evolving a co-design space with stakeholder and designer prompts. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*, 419–428. <http://doi.acm.org/10.1145/2470654.2470715>
  21. Daisy Yoo, Milli Lake, Trond Nilsen, Molly E. Utter, Robert Alsdorf, Theoneste Bizimana, Lisa P. Nathan, Mark Ring, Elizabeth J. Utter, Robert F. Utter, and Batya Friedman. 2013. Envisioning across generations: A multi-lifespan information system for international justice in Rwanda. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*, 2527–2536. <http://doi.acm.org/10.1145/2470654.2481349>
  22. Daisy Yoo, Katie Derthick, Shaghayegh Ghassemian, Jean Hakizimana, Brian Gill, and Batya Friedman. 2015. Multi-lifespan design thinking: Two methods and a case study with the Rwandan diaspora. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '16)*, 4423–4434. <http://doi.acm.org/10.1145/2858036.2858366>