

A QUALITATIVE STUDY ABOUT DESIGNING AND EXPRESSING EMOTION: A TALE OF TWO CYCLES

Research Paper

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Abstract

The usage of emoticon has escalated exponentially in recent years, triggered by the proliferation of emoticon design. Yet, our understanding of how emoticon usage and design may interact with each other remains limited. In this study, we undertook an in-depth qualitative approach to elucidate the dynamic process through which emoticon usage and design interact. Highlighting the differences from the conventional IT system design frameworks, we proposed a holistic two-cycle (i.e. rationalism and symbolism) view of emoticon usage and design interactions, and underscored the mechanisms involved.

Keywords: Emoticon, Design, Usage, Framework

1 Introduction

A picture is worth a thousand words. This is no exaggeration especially when it comes to the use of emoticon. Emoticon² is defined as “pictographs that are used to express emotion or as surrogates for nonverbal communication” (Thompson and Foulger 1996, p.226). According to a recent study by Google, emoticon is used “six billion times a day and have been described as the fastest growing language in history” (Telegraph, 2018). Even the Oxford Dictionaries made a historic move by naming an emoticon (i.e., “Face with Tears of Joy”), rather than a word, “Word of the Year 2015”. Indeed, the awarded emoticon accounted for more than 20% of all emoticon in the US and UK (SwiftKey, 2015). Given the prevalence and popularity of emoticon, the first female US presidential candidate nominated by a major political party, Hillary Clinton, tried to exploit emoticon during her campaign too (Time, 2015).

Where there is popularity, there is money to be made. Hence, the design of emoticon has evolved from personal hobbies of a few individuals during its primitive introduction in the 1990s to become the core business of numerous entrepreneurs and start-ups (e.g., Kimoji, Swyft Media). Although precise evaluation of the entire emoticon industry is hard to come by, numerous reports have provided us with some hints regarding its worth. For example, Line reported that the selling of emoticon has generated about \$268 million in revenue in 2015 (Quartz, 2016). Snapchat has recently acquired a small emoticon start-up for \$100 million (CNBC, 2016). Nowadays, most major social networking applications (e.g., iMessage, Facebook Messenger, Snapchat, Line, WeChat and the alike) have all integrated built-in emoticon into their platforms (Forbes, 2016). To boost business further, WeChat has recently launched

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² In this research, we do not differentiate between emoticon and emoji. They are used interchangeably.

its sticker (emoticon) open platform to encourage WeChat users to create and even sell their own emoticon (NetEase, 2015).

The ubiquity of emoticon in the digital environment has also attracted attention of researchers from different disciplines. Investigating from the usage perspective, prior research in Information Systems (IS) and Computer-Mediated-Communication (CMC) has primarily focused on the motivation behind emoticon adoption and emotional expression (Abbasi and Chen, 2008; Stein et al., 2015; Zhang, 2013). Likewise, in other disciplines (such as psychology and sociology), research has largely focused on the psychology and/or behavior of emoticon usage (Dresner and Herring, 2010; Provine et al., 2007; Skovholt et al., 2014; Walther and D'Addario, 2001). Noteworthy, there is a lack of research investigating from the design perspective. The few studies that do so simply infer the necessary core elements/factors for designing emoticon from psychological and behavioral research (Elfenbein et al., 2002; Pullman and Gross, 2004; Smith and MacLean, 2007).

In essence, there is hardly any research investigating how the usage and design of emoticon are intertwined in their interactions and influences. Extant academic discourse surrounding the usage and design of emoticon exists largely in separation, although reality is otherwise. As pointed out by Hevner et al. (2004), “design is both a process (set of activities) and a product (artifact) (p. 78)”. Design and usage are intricately related. Despite some useful insights offered by information technology (IT) system design frameworks (Hevner et al., 2004; Peffers et al., 2007), we observe several critical differences between the process for designing conventional IT system and the process for designing emoticon:

1. The conventional IT system design process is typically long, but the emoticon design process tends to be much faster with relatively short life-cycle;
2. The conventional IT system design process typically distinguishes designers from users, but the emoticon design process is not the sole prerogative of designers, as users often get involved too;
3. The conventional IT system design process is generally guided by pre-determined goals/objectives, but the emoticon design process is often exploratory and affected by current affairs/trends.

Given that there is a paucity of research exploring design and usage of emoticon (Sutton and Lawson, 2017), our theoretical understanding has lagged behind practice. Clearly amiss is an integrated and comprehensive understanding of the potential interactions and influences between emoticon design and usage, which are likely dynamic and complex. We hence propose our research questions:

How does the process of emoticon design get affected by emoticon usage and vice versa? What are the mechanisms at work?

Our paper aims to make three critical contributions to the literature. First, we elucidate a two-cycle (i.e., rationalism and symbolism) framework that provides a more holistic understanding of the relationship between emoticon usage and design. More importantly, these two cycles capture not only the normative aspect of emoticon design, but also a novel but irrational aspect. Second, unlike the stability suggested with regards to knowledge base and objectives in conventional IT system design frameworks (Gregor and Hevner, 2013; Hevner et al., 2004; Mandviwalla, 2015; Peffers et al., 2007), we unravel a more dynamic “design knowledge generator” and “design objective disrupter” roles of usage appropriation. Third, challenging past works, we highlight a more significant role of emoticon usage in the emoticon design process. The integration of both emoticon usage and design is important and cannot be undermined.

We organize our paper as follows. In the next section, we review and synthesize related literature to form the base of our theoretical development. We then detail our research methodology, providing a systematic and comprehensive account of our data collection, coding process, and data analyses. From our findings, we also propose a two-cycle emoticon design framework. Acknowledging some limitations, we conclude with a discussion on the theoretical contributions and practical implications of our study.

2 Literature Review

2.1 Emoticon

In IS field, research on emoticon largely falls into two streams, namely: (i) emoticon usage and (ii) applied context. The first stream of research (i.e., emoticon usage) typically examines either the motivation driving emoticon usage or the differences in emoticon usage behavior. For example, studies have found the major driving force of emoticon to be the ability to overcome prior limitation of traditional CMC, by providing additional non-verbal cues, communication expression and potential interpretation (Derks et al., 2008). Nonetheless, other researchers have cautioned against emoticon as it may create ambiguity or even be perceived as sarcasm (Derks et al., 2008). Some studies have found differences in emoticon usage behavior, and attributed them to a difference in gender, personality or culture (Park et al., 2014; Tossell et al., 2012; Wolf, 2000; Xu et al., 2007).

The second stream of research (i.e., applied context) typically investigates the different context that emoticon is adopted. As expected, emoticon is most often used to mimic offline face-to-face interactions, such as in social communication related context (e.g., instant text message (Tossell et al., 2012) and social network sites (Park et al., 2013)). Other contextual differences that have been found to be influential include tasks (Gallo et al., 2017; Yigit, 2017), and social relationships (Hsieh and Tseng, 2015; Rodrigues et al., 2017). A summary of these two streams of research is depicted in Table 1.

Research Stream	Some Sample of Research Topics
Emoticon Usage	Emoticon Usage Motivation: (1) strengthen verbal expression and interpretation (Derks et al., 2008; Jibril and Abdullah, 2013; Kaye et al., 2016); (2) establish emotional tone and mood (Kaye et al., 2016)
	Emoticon Usage Behavior: (1) gender (Tossell et al. 2012; Wolf 2000); (2) personality (Xu et al., 2007); (3) culture (Park et al., 2013)
Applied Context	Communication Context: (1) instant text message and online chat (Tossell et al. 2012; Kaye et al. 2016); (2) social networks sites (e.g., Facebook and Twitter) (Park et al., 2013)
	Other Context: (1) tasks (Yigit, 2017); (2) social relationships (Hsieh and Tseng, 2015)

Table 1. Two streams of literature on emoticon.

2.2 Conventional IT System Design

The building of IT system instantiations is regarded as the “purposeful seeking of a solution” (Archer, 1984). Inspired by the principles rooted in engineering literature, Peffers et al. (2007) described a set of design processes specifically for IT system designers. The guideline includes six processes: problem identification and motivation, define the objectives for a solution, design and development, demonstration, evaluation, and communication. Targeted at IT system design, the guideline does not seem to fit emoticon design process perfectly. Fundamentally, IT system design aims to solve specific problems. Hence, it is crucial to identify clear and valuable problems. After the identification of problems, the design process needs to determine the desired functionality of the artifact (Peffers et al. 2007). However, emoticon design may not demand such precision: instead of ensuring its key desired functionality for accurate communication, it simply needs to provide enough delightfulness (Hsieh and Tseng, 2017). Apart from the initial need to identify specific problems, conventional IT system design also requires a more rigorous process, such as the demonstration and evaluation of the IT system (to prove that it works correctly). Again, emoticon design may be less demanding in these aspects. In sum, the need for such a stringent IT system design guideline is to ensure a more accurate function-based system, but consequently a longer development period. However, the general design process in the

emoticon industry is very different. As the objective underlying emoticon design is inherently nebulous, and demonstration and evaluation are not as stringent, compounded by the fact that popular emoticon often changes rapidly, we certainly need to renew our theoretical understanding of the emoticon design process.

Nonetheless, aforementioned, past work on IT system design may hint at the directions we can take to address the research gaps highlighted in the Introduction. First, extant emoticon literature typically focuses on usage study, with hardly any study exploring the dynamic interplay between emoticon usage and design. As informed by conventional IT system design frameworks (Hevner et al., 2004; Peffers et al., 2007), the usage and design interactions are iterative, rather than a linear process. Such iterative process starts from problem identification to system usage evaluation and final communication (Peffers et al., 2007). Usage evaluation serves the essential role of providing feedback to design (Hevner et al., 2004; Peffers et al., 2007). Drawing upon these insights, we posit that the relation between emoticon usage and design may be inseparable too, though the entire process/framework may differ from those of conventional IT system design. Second, although conventional IT system design framework does consider usage evaluation/feedback, the role of usage evaluation/feedback is highly restricted and confined into certain range. Specifically, evaluation/feedback only occurs at the final stage and is targeted at whether the design (and functionality) correctly solves the problem (Peffers et al., 2007). Noteworthy, conventional IT system design frameworks may not entirely be apt for emoticon design due to its rigid view of iteration. In response to these unexplored literature gaps, we attempt to conduct a qualitative study to generate a holistic mapping between emoticon usage and design.

3 Research Methodology

3.1 Data Collection

To address our research questions, we decided to adopt the qualitative approach (Yin, 2003), for two reasons. First, our primary research question is to explore “how” emoticon design and usage dynamically evolve with each other, and to investigate the mechanisms underlying this co-evolving process. Such “how” questions and underlying mechanisms could be better explored through the qualitative approach that provides a holistic understanding of real-life events (Yin, 2003) and allows us to explore dynamic processes involving potential causal mechanisms (Pettigrew, 1992). Second, as emoticon usage and design are intricately intertwined, only through qualitative approach (including interviews) can we successfully gather a rich description (Schultze and Avital, 2011) and better understanding of the complexity and nuances underlying emoticon usage and design process. Interviews will allow us to probe deeper into the thoughts of both designers and users, as well as allow them to explain in much more details.

To gain a more holistic view, we collected data from two different groups of interviewees from January 2016 to May 2016, namely: (i) emoticon users; and (ii) emoticon designers. We conducted a total of 30 face-to-face semi-structured interviews (i.e., 20 with emoticon users, and 10 with emoticon designers). Each interview lasted between 60 minutes to 90 minutes. We designed an interview protocol (Turner, 2010) comprising (i) an interview introduction, (ii) key research questions, (iii) transition messages, (iv) probes to follow key questions, (v) spaces for recording interviewers’ comments, and (vi) researchers’ reflective notes. For all the interviewees, we first collected some demographic/background data, such as gender, age, years of emoticon usage/design. We then asked emoticon users more questions such as “*Can you please share with us your experiences of using emoticon when communicating with others?*”, “*Does the emoticon express what you want?*”, etc. Likewise, we also asked emoticon designers more questions such as “*How do you design your emoticon? And how do you conceive your design ideas?*”, “*Does user’s behavior influence your emoticon design?*”, etc. During the interview process, if we were intrigued by any interesting points raised by the interviewees, or if we needed more explanations or clarifications, we would probe further and allow the interviewees to go beyond the pre-prepared questions.

The emoticon users comprised 8 males and 12 females, with age ranging from 17 years old (teenagers) to 45 years old (adults). They were familiar with online communication and hence, could provide rich descriptions of their opinions and feelings regarding emoticon usage and design. The emoticon designers comprised 4 males and 6 females, with emoticon design experiences ranging from 2 years to 5 years, and had worked on different platforms (e.g., WeChat, QQ). Noteworthy, all interviewees (i.e., emoticon users and emoticon designers) had been promised anonymity and confidentiality, so that they would feel at ease and be totally honest in sharing their experiences, opinions and feelings.

3.2 Data Coding and Analyses

After transcribing all the 30 interviews, we gathered the data into one database. Four researchers were tasked to analyze and “code” all the interview transcripts, systematically according to the procedures and guidelines suggested by Saldaña (2015). Noteworthy, “coding is not just about labeling, but linking from the data to the idea and back to other data” (Saldaña 2015, p.8). The four researchers first independently and iteratively coded the entire data. In the first cycle, they went through line-by-line the entire transcript and performed descriptive coding (Saldaña 2015, p.61), bearing in mind the epistemological research questions.

For emoticon users, the focus was on how users use emoticon to express their emotion. In the initial coding, every line that conveyed users’ understanding (or non-understanding) of the meaning of emoticon and how emoticon was used as intended (or differently) to express their emotion online was coded. For example, using descriptive coding, the researchers labeled the transcript “*I sometimes know that words are more accurate, but I still like to use emoticon*” as “emoticon usage – expression paradox”. Any differences in coding were subsequently discussed and resolved among the four researchers. The coding process was repeated until no new labels were identified as the four researchers went back and forth through the original data. Consequently, four relevant first order categories were identified in the first cycle, namely: (i) unconscious misuse, (ii) conscious change, (iii) unexpected usage, and (iv) expression paradox.

For emoticon designers, the focus was on how designers learn from usage patterns to design their emoticon. Likewise, in the initial coding, every line that conveyed designers’ approach (or method) and beliefs (or non-beliefs) was captured and coded. For example, we labeled the transcript “*I have the gut feeling that users nowadays are aesthetically fatigue, hence my design will not abide by aesthetic principles. Instead, I prefer to include elements that may be considered ‘ugly’*” as “emoticon design – beliefs or idiosyncrasies”. Eventually, two relevant first order categories were identified in the first cycle, namely: (i) discovery and improvement, and (ii) beliefs or idiosyncrasies. In essence, the primary objective of the first cycle of coding was to provide relationships between codes and the underlying meaning across codes for sorting.

After the first cycle of coding, the four researchers proceeded to the second cycle of pattern coding (Saldaña, 2015), which sought to unravel more general concepts in the themes. In the second cycle, much deliberation was done until they eventually arrived at four themes that well captured the first cycle of codes regarding emoticon usage and design, namely: (i) appropriation; (ii) symbolization; (iii) instantiation; and (iv) deification. The first two themes encapsulate usage behaviors while the last two themes encapsulate design actions. Specifically, “appropriation” refers to usage behaviors whereby users either unconsciously or consciously change the meaning of emoticon, while “symbolization” refers to users’ unexpected usage or their usage experiences. “Instantiation” is a key factor in design science theories (Hevner et al. 2004) widely used to explain how designers develop and improve IT artifacts. We adapted “deification” (proposed by Hirschheim and Newman (1991) to help explain why typical IS development is not a normative process reflecting conventional economic rationality) to capture the theme underlying beliefs or idiosyncrasies of designers. A sampling of our coding is illustrated in Table 2.

Examples	First Order Categories	Second Order Themes
“Sometimes, when communicating with others, I often find that how I used some emoticon is not how most people use them ... I do not know this [emoticon] is supposed to be used like that, instead I use it to mean something else.” – From user Ms.Johnson ³	Users’ unconscious misuse	Appropriation
“At first, I just regard this emoticon [face with tears of joy] as an expression depicting laughter. But now I am influenced by my friends. I use this emoticon differently, to express either mixed emotion or feeling of awkwardness.” – From user Ms.Jane	Users’ conscious change	
“Instead of a normal emoticon, now I use rage emoticon more often. The rage emoticon does not follow aesthetic design, but I like its exaggerated facial expressions.” – From user Mr.Neil	Users’ unexpected usage	Symbolization
“When I want to express my extreme happiness on WeChat, I will always send an emoticon to my friends ... I realize that text is more effective, but I do not know why I always choose emoticon.” – From user Mr.Adam	Users’ expression paradox	
“A user told me that he used the emoticon [smiley] to express disdain ... then I started searching psychology articles, I learnt that the amount of sclera revealed can convey a supercilious impression ... hence, I designed this new emoticon.” – From designer Mr.Dickson	Designers’ discovery and improvement	Instantiation
“I have the gut feeling that users nowadays are aesthetically fatigue; hence my design will not abide by any aesthetic principles. Instead, I prefer to include elements that may be considered ‘ugly’.” – From designer Ms.Yellen	Designers’ beliefs or idiosyncrasies	Deification

Table 2. A Sample of Our Coding.

4 Findings

4.1 Toward a Two-Cycle Emoticon Design Framework

Design and usage are inherently inseparable from each other. Design theories typically characterize design as an iterative process which receives feedback from usage at each iteration, and eventually terminates at the desired state (Mandviwalla, 2015; Peffers et al., 2007). This is aptly illustrated by Hevner et al. (2004) Guideline #6: “the design for an effective artifact requires utilizing available means to reach desired ends while satisfying laws in problem environment” (p.83). Although there are hints of design cycle (i.e., iterations), many prior works impose a rather “rigid” view of the key inputs (i.e., knowledge base and design objectives) for the iteration. As we will highlight subsequently, the key inputs can be more and varied in emoticon design.

Both Hevner et al. (2004) and Peffers et al. (2007) have underscored a clear problem and objectives as a prior requirement for design cycle. Specifically, Hevner et al. (2004) highlight that a relevant design objective should impose goal criteria as well as constraints upon a system whereas Peffers et al. (2007) highlight that design objective should be inferred rationally from a prior problem statement. Likewise, both papers are clear about the knowledge base. Hevner et al. (2004) note that artifacts are designed through either extending or applying existing knowledge base in new and innovative ways, while Peffers

³ For anonymity and confidentiality reasons, we have used pseudo-names such as Ms.Johnson, Mr.Neil, etc. which are not the real names of the interviewees.

et al. (2007) note that solution comes from knowledge of what is possible and feasible. Although there is a brief mention of possible addition to knowledge base (Hevner et al. (2004), it is unclear how it may occur. We can however learn from Mandviwalla (2015) in their focus on building design theory (rather than design artifacts). They mention that change can be affected as a result of inspirations from the act of design or new insights from evaluation. Hence, our proposed framework will shed light on how design knowledge base and objectives are dynamically changed in the process of emoticon design (i.e., design of artifacts).

Challenging prior assumptions and constraints (e.g., rigid view of key inputs, reliance on existing knowledge base, etc.), our data analyses and findings reveal a rather different story of emoticon usage and design interactions. Specifically, we propose a framework comprising two concurrent cycles (i.e., a rationalism cycle and a symbolism cycle) (see Figure 1).

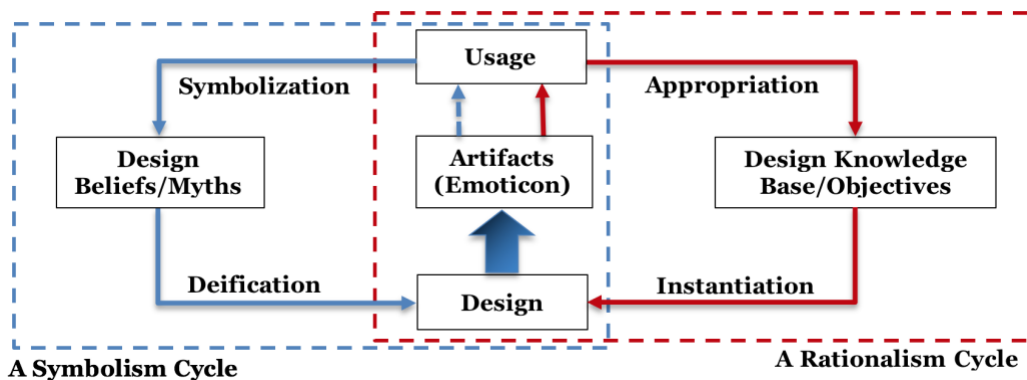


Figure 1. A two-cycle emoticon design framework.

4.2 A Rationalism Cycle

Rationalism is the doctrine that knowledge is acquired by reason without resort to experience (Bourke, 1962). We define the “rationalism cycle” as the normative process that captures the fundamentals of emoticon design process. The cycle is characterized by “appropriation”, “design knowledge base/objectives”, and the mechanism “instantiation”.

4.2.1 Appropriation

From the users’ perspective, appropriation refers to their choice in terms of the artifact’s features used within a specific interaction, and thus, determines the artifact’s behavior in an interaction (Al-Natour and Benbasat, 2009). Our analysis shows that users constantly express their emotion by expanding or limiting the original functionality of the artifacts (i.e., emoticon). The original functionality is often dictated by the designers in the apparent emotion embodied in the artifact (e.g., the original functionality of a smiley face is to express happiness or positive emotion). In most cases, users tend to “expand” the original functionality. User Ms.Jane shared, “*Sometimes, I would use a smiley face to even express a feeling of discomfort, and that I wish to end the conversation.*” Another user Ms.Emily added, “*The emoticon waving hands used to mean goodbye; however, among our peers, there is a tacit agreement that the emoticon can also poke fun at the situation whereby you have made me angry*”.

“Appropriation” is also confirmed by designers. From the designers’ perspective, users’ appropriation is often manifested in the form of distortion from the original functionality. Designer Mr.Johnson lamented, “*Often, when chatting with my friends, I found that they had distorted the original meaning [and use] of my emoticon design. They had either used it in a completely antagonistic way or let the more obscure designs outshine the main ones.*”

Unlike extant conventional IT system design frameworks whereby usage typically serves the role of providing measurement or guideline for convergence to design objectives (thereby emphasizing the power that favors designers rather than users), our analysis elucidates the power shift from designers to

users (due to appropriation). We hence underscore that “appropriation” enables users to influence emoticon design process through updating or changing designers’ knowledge base and objectives.

4.2.2 Design Knowledge Base/Objectives

In order for “appropriation” to update or change designers’ knowledge base and objectives, our analyses unravel two possible functionalities, namely: (i) design knowledge generator; and (ii) design objective disrupter.

“*Design knowledge generator*” refers to the creation of artifacts in conventional design iteration by means of designers consulting their knowledge base. Indeed, our data analyses show that most emoticon designers do have a rich aesthetics, psychology, and/or technology background. The most referenced knowledge base is that in areas of psychological emotion classification and/or art-engineering. More importantly, our study underscores that designers do learn and update their knowledge base through observing users’ distorted usage of design artifacts (i.e., emoticon). Users often consciously or unconsciously appropriate the design artifacts according to their own whims and fancies. Designers unfortunately can only observe the behavior but not read the mind; hence, they often have to enrich their knowledge base through questioning and researching to better comprehend these unexpected behaviors. They assume that behavior stems from some embedded knowledge (of the users) that developers’ current design knowledge base is lacking. Designer Mr.Dickson shared an excellent example, “*I often learn from the distorted usage of emoticon from users ... for example, many users use the same smiley face to express a rather negative feeling ... only did I learn subsequently that the problem is not with the smiley expression, but rather the eyes ... to be more specific, a lot of sclera can indicate a strong negative feeling ... this has some psychological origins.*”

“*Design objective disrupter*” refers to the termination of conventional design iteration when evaluation suggests a convergence to the predetermined design objectives. Unlike past studies, our data analyses reveal a different story for emoticon design; specifically, we find that convergence is often elusive (because the design objectives are constantly evolving). More importantly, the driving force behind the change is due to users’ appropriation. When probed about the initial design objective for a specific emoticon, designer Ms.Lily replied, “*In the beginning, we have clear objectives, for example, clarity of expression, or how we wish the emoticon to be used ... over time, we find that how it will be used is just as unpredictable as human emotion itself ... it has become extremely hard for us to give a clear objective of design as we know for a fact that it will be distorted by users subsequently ... now we do not care as much about objectives, and simply put what we design directly into the market.*”

4.2.3 Mechanism: Instantiation

“Instantiation” is defined as the realization of artifact in its environment (March and Smith, 1995). Our analysis reveals the mechanism through which the two functionalities (i.e., design knowledge generator and design objective disrupter) jointly influence the final design artifacts. Users’ appropriation of the designed artifacts enlarges and updates the design knowledge base of designers, which then helps expand the design possibilities. Meanwhile, appropriation also disrupts the stabilizing role of conventional design objective, resulting in the unnecessary need for convergence. Hence, the output of each iteration is no longer a prototype, but a market-ready product that would further enlarge the knowledge base of future design through appropriation. Indeed, designer Ms.Johnson opined, “*I believe the key driver for emoticon design is really the usage. Not only does it follow the market principle that demand generates supply, but also demand diversifies and instantiates supply.*” In some cases, if the designed emoticon is not popularly used, designers will also reflect on such “failures” to equip their design knowledge base as to why the failures arise. As designer Mr.Adam vividly explained, “*The constant reflection on why certain design would fail is of vital importance to me ... they help reveal important knowledge about some underlying principles informing what to avoid in a design ... and I consciously avoid committing the same mistakes when I am designing my subsequent emoticon.*”

Despite having shed much new insights, the “rationalism cycle” still seems to conform to a normative view of design reflecting economic rationality. If only “the rationalism cycle” exists, all design and

usage would adhere to testable and generalizable knowledge. However, reality begs to differ. Importantly, our data analyses further reveal an “irrational” usage and design interaction cycle. Just like the way some unexpected behavior is being touted as “being emotional”, we discover that the emoticon usage and design cycle can be just as unpredictable.

4.3 A Symbolism Cycle

Novel and unobserved in prior works, the “symbolism cycle” captures an irrational dimension in the emoticon design process. Specifically, it relates usage and design interactions that involve irrational actions without compelling usage reasons (Elster, 1984). In particular, we adopt the symbolic approach that is often used to interpret seemingly irrational actions as symbols because it has the advantage of gaining a much richer understanding of the world (Hirschheim and Newman, 1991). The cycle is characterized by “symbolization”, “design beliefs/myths”, and the mechanism “deification”.

4.3.1 Symbolization

“Symbolization” refers to a process that combines an object with meanings that reach beyond and surround it (Hatch, 1993). Symbol has long been studied in the field of anthropology and sociology (Astley, 1984; Feldman, 1989; Wexler, 1983), noting that a symbol is created subjectively and invested with a particular kind of subjective meaning (Pondy, 1983). We find that symbolization could be used to describe the process through which irrational usage behavior is embodied in the subjective meaning of designed emoticon. We first depict the irrational usage behavior.

Noteworthy, our data analyses reveal an important irony – on one hand, users explicitly express their desire for emoticon to accurately express their emotion (to avoid miscommunication); on the other hand, users’ behavior shows their inclination toward ambiguity over precision. For example, user Ms.Kate enlightened, *“I always pay attention so as to avoid misunderstanding when messaging using emoticon, especially when I am talking with others through cellphone ... but I just cannot resist using those popular but subtle emoticon.”* She further added, *“I believe those emoticons are popular because they are subtle.”* Yet another example, user Mr.John described, *“When I am stressed, I tend to send a lot of emoticons to my friends, although I think one emoticon is enough to express my feeling. As several emoticons are sent simultaneously, my friends may even become confused ... but somehow, I still prefer to send emoticon. I am also confused.”*

4.3.2 Design Beliefs/Myths

Having highlighted the ironies in life and the irrationalities in users, we next elucidate how designers incorporate this seemingly irrational usage into their design artifacts. Designers basically try to “internalize” these observations in a form (i.e., design beliefs/myths) that is inherently different from design knowledge base (aforementioned in the rationalism cycle). These design beliefs/myths are certainly not grounded in any sound theories or principles; neither are they formally tested nor proven. They are more akin to the gut feel of developers, we hence coined them as “design beliefs/myths”. A myth is defined as “an unquestioned belief about the practical benefits of certain techniques and behaviors that is not supported by yet demonstrated facts (p. 655)” (Trice and Beyer, 1984).

As designer Mr.Armstrong explained, *“I suspect that users do not always know what emotion they wish to express exactly ... if they do, I suspect [jokingly] they will use no emoticon to express.”* This reaffirms the irony in life. Another designer Mr.Zin concurred, *“Users love to express their emotion in a vague way. Otherwise, [if they want to be precise], the ‘Face with Tears of Joy’ should never be popular *laugh*. By my standards, that emoticon conveys nothing as it conveys almost everything.”*

In addition, our data revealed other interesting “design beliefs/myths”, such as *“sexual innuendos are celebrated”, “ugly is beautiful”, “new is always better”* and the alike. It is evident that developers see no need in verifying the veracity of them.

4.3.3 Mechanism: Deification

The important revelation of “design beliefs/myths” influencing design artifacts (i.e., emoticon) cannot be undermined. When developers were asked how they had been influenced, designer Ms. Yellen replied, “*I cannot explain exactly how it has influenced my design, but I constantly think about it during design ... I believe it either helps determine the underlying theme for my design or guide the selection or deletion of some specific design components.*” We term the mechanism “deification”, to connote the unconscious and conscious influence of an elusive belief/myth. Designer Mr. Dong brought up the notion of “glue”. He explained that these beliefs/myths, somehow, miraculously helped glue all his different design choices together and shape his final emoticon design. He even analogized it to religion that helped bind people together. In an attempt to enlighten further, another designer Mr. Zin regarded beliefs/myths as a superstition, “*Just like real superstition, you never blame failure on the higher mighty; although you cannot prove its existence, you have to submit to its imaginative power!*”

In sum, both “the symbolism cycle” and “the rationalism cycle” are critical to a comprehensive understanding of emoticon usage and design process.

5 Discussion and Conclusion

5.1 Theoretical Contributions

Three general theoretical contributions are made by our present study. First, we elucidate a more holistic view of usage and design interactions, proposing a two-cycle (i.e. rationalism and symbolism) framework to better depict the emoticon design process. The rationalism cycle characterizes a normative emoticon design process, while the symbolism cycle signals a novel but irrational design process. In the rationalism cycle, normative usage and design interactions occur as users’ appropriation behavior pushes emoticon design through rapid prototyping with designers swiftly instantiating the knowledge generated from the appropriation behavior. Meanwhile, in the symbolism cycle, symbolized irrational usage behavior impacts the emoticon design with designers relying on the deified myths/beliefs generated from the symbolized irrational usage behavior. Noteworthy, the rapid design prototyping that we have found in this study is not entirely unique to the context of emoticon design, but also to the design of other digital products/artifacts in general (Sass and Oxman, 2006). However, we find that the output of each iteration is not simply a prototype (for further enhancement), but a market-ready product; this likens many new digital products/artifacts that are launched immediately (despite having potential flaws/bugs) and are quickly overtaken and enhanced by newer versions. In sum, it is plausible that many other digital products/artifacts design process would involve not only a rationalism cycle, but also embrace a symbolism cycle.

Second, we highlight a more significant role of emoticon usage in emoticon design process. More importantly, unlike conventional IT system design frameworks whereby the power favors designers rather than users (as usage typically serves the role of providing guideline for convergence to design objectives), we underscore the power shift from designers to users (as usage impacts design due to appropriation). As extant literature surrounding emoticon is dichotomized into either emoticon design study or emoticon usage study (McGrath, 2006; Pullman and Gross, 2004; Smith and MacLean, 2007; Stein et al., 2015; Zhang, 2013), they are unable to make such a discovery. Our study is amongst the first to integrate both perspectives and unravel intricate interactions and influences between emoticon usage and design. Usage can influence design either normatively through users’ appropriation or irrationally through users’ symbolization to affect designers’ knowledge base/objectives and designers’ beliefs/myths respectively. Once again, the integration of usage and design is critical toward a more comprehensive understanding of emoticon research.

Third, by unraveling the generator roles and the disrupter roles of usage appropriation to the design knowledge base and objectives, our study adds to a more nuanced understanding of design knowledge base and objectives in emoticon design. Unlike conventional IT system design frameworks, whereby the design knowledge base and objectives tend to be stable and static (Gregor and Hevner, 2013; Hevner

et al., 2004; Mandviwalla, 2015; Peffers et al., 2007), we reveal that, in emoticon design, design knowledge base and objectives are dynamically changed. Future research should hence be cognizant about such dynamisms to establish a more accurate view of emoticon design process.

5.2 Practical Implications

We believe that our study also has important implications to the practitioners. For professional emoticon designers, we suggest that an effective way to maintain competitiveness in the ever-increasing user-dominant digital environment is through the conscious accumulation of some rather “mysterious” design knowledge found in patterns of user engagement. For digital platform owners, we suggest that they should actively bring designers and users together so as to promote more vibrant digital content (e.g., emoticon) generation. This active integration of usage and design would likely produce more enduring emoticon that could generate significant economic value for the platform owners.

5.3 Limitations and Future Directions

To conclude, our exploratory study adopts the qualitative approach to elucidate the dynamic interactions between emoticon usage and design. We unravel both a rationalism cycle and a symbolism cycle that capture two unique ways in which emoticon usage interacts with design. Despite our effort and rigor, we do acknowledge some limitations. For example, although we have characterized a dynamic interplay between emoticon users and emoticon designers, there is the possibility of an uncaptured third-party stakeholder, such as the platform owners, that could influence such interplay. As platform owners increasingly seek to monetize emoticon, they may impact the design and use of emoticon through their policies/regulations and technological capabilities/limitations. As a future direction, researchers could explore the impact of platform owners on emoticon usage and design. In spite of the limitations, we do believe that our proposed two-cycle emoticon design framework, being parsimonious, is likely generalizable.

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