



Empathy in Service Design: Prompting Employees' Empathy with Users through Love and Breakup Declarations

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ABSTRACT

Effectively prompting empathy from service employees towards users is a challenging yet essential endeavor to support user-centric approaches plebiscited by service companies. In this study, we investigate to which extent emotional and engaging users' insights — under the form of love and breakup (L&B) declarations to a service — support employees' empathy towards users. We played back to railway employees ($N = 230$) six audio recordings of passengers' love or breakup declarations addressed to the service. Through quantitative measures, we analyzed the employees' ability to recognize passengers' emotions (empathic accuracy), their resonance with their emotions (emotional resonance), and several additional indicators of empathy. Our findings show no direct increase in employees' empathy but shed light on key factors influencing emotion recognition and resonance, and on employees' perceptions of their ability to impact the passenger experience. We discuss the opportunities and challenges of using L&B declarations to trigger service employees' empathy.

CCS CONCEPTS

• Human-centered computing → Empirical studies in HCI.

KEYWORDS

empathic design methods; service design; empathy; empathic accuracy; service employees

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1 INTRODUCTION

Service employees shape and deliver the user experience of services [34, 64, 83, 100]. Hence, conveying an empathic understanding of customers to service employees supports an empathic design approach within a service organization [7, 18]. Empathy leads to

better customer-employee interactions, customer satisfaction, forgiveness, and loyalty [7, 52, 102], and positively impacts service quality [7, 62]. Empathy facilitates stakeholder collaboration and leads to common references and agreed solutions for the users. It is instrumental in breaking silos inside organizations [83].

Building service employees' empathy implies engaging them in user research, going “from being informed of user research to being engaged in user research” [65]. Without turning companies' stakeholders into designers, opening their minds and developing their ability to take the perspective of users is crucial. This goes through understanding users' emotions and their values [12], their experiences, and recognizing their feelings and thoughts.

While empathic methods have traditionally focused on designers [19], the discipline lacks intelligible empathic methods tailored to an audience of stakeholders who are neither trained in user research nor design thinking [44]. Healthcare is a rare domain [7] that researches methods to convey empathy to employees [50, 66, 69, 69]. Empathic methods can be grouped into three categories [103]: ethnography-based methods which capture users' lived experiences in situ (e.g., participant observation) or via specific media (e.g., cultural probes); narrative-based methods that capture aggregate users brought to life through crafted, life-inspired experiences (e.g., personae, scenarios, design documentaries); and methods for imagining others where designers enact behaviors as if they were the users through props or prototypes (e.g., roleplay).

In this paper, we researched the use of an empathic method to convey user research insights to service employees of a railway company. Previously used in the railway sector to investigate passenger experiences [17], love and breakup (L&B) declarations have been described in the literature [24, 43, 55, 86] as able to enhance emotional understanding and foster empathy towards individuals. Our study investigates how listening to L&B declarations from service users might trigger service employees' empathy towards them. For this purpose, we measured employees' empathy before and after listening to the declarations. We also collected five indicators of empathy: employees' emotional recognition and emotional resonance with users, employees' self-reported learning about users, interest in users, and their perceived ability to help them.

This work contributes to the design field by providing a rare empirical study focused on how an empathic design method can support the development of service stakeholders' empathy for customers. While technological products and software are more and more commercialized as embedded into services, empirical research on empathy building in HCI is worthwhile, and timely to define scopes in which other stakeholders can support user-centric approaches and design practitioners' work.

*Both authors contributed equally to this research.



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2 RELATED WORK

2.1 Techniques to Convey User Insights from User Research

Designers immerse themselves in users' worlds during the user research phase [37]. They collect raw data like users' stories and anecdotes [78], allowing them to imagine the users' thoughts and better picture the situational contexts in which users experience the service. For this purpose, user researchers developed techniques to make user research findings intelligible [44], facilitate the designers' empathic handover [81], and tell narratives [64]. Fictional, narrative, and storytelling techniques increase empathy in the long term [5].

Direct contact with users in the empathy process is emphasized in the literature as stimulating designers' empathy [37, 54, 87]. van Rijn et al. [96] conducted a study comparing three sources of information on how they support designers to empathize with users. Direct contact supported empathy the most, followed by video material, and last, background information. Table 1 summarizes existing techniques to convey empathy toward users.

Designers have developed methods that require user research expertise and an open mind to understand user experience and map user insights. Methods such as observation techniques can be perceived as not very creative and engaging whereas others, like design probes, are deemed too unconventional or not understandable for an audience of service employees. However, these methods can help develop the empathy of stakeholders, if well adapted to their UX maturity. Journey maps or personae synthesize user research and facilitate the understanding of user experience [32, 33]. Collaborative techniques involving transverse teams from diverse backgrounds generate enriching discussion for the stakeholders [83]. The playful and immersive aspects of methods like simulators [58, 81], physical journey maps [42], love and breakup method [24], or design games [61] can invite the stakeholders physically to get in users' shoes and feel more engaged.

2.2 Empathic Accuracy Techniques

The design field lacks dedicated measurement tools of empathy [10, 89], and usually borrows methods from psychology, like self-report scales (e.g., Empathy Quotient [6] and Empathy Assessment Index [48]). Designers' ability to recognize users' thoughts and emotions is, among others, an indicator of an empathic understanding of users. This empathic understanding feeds designers' ideations of adapted solutions to users' needs. Empathic accuracy techniques are common in psychology [29] and were recently adopted in design to investigate designers' empathy [9, 47].

In the 1990s, Ickes [29] defined the concept of empathic accuracy and invented the dyadic interaction paradigm [30] still used today. It consists of recording an interaction between two persons. The first person watches the recording and indicates when and what they felt and thoughts along the interaction. Then, the second person is asked to watch the recording. Each time the first person mentioned having felt or thought something, the second person had to guess what the first person's feelings and thoughts were. The researcher compares the first and second person's answers to assess the second person's empathy accuracy. Stinson and Ickes [85] used this method to show that "friends were found to be more

accurate than strangers in inferring each other's thoughts and feelings." Hall and Schmid Mast [25] demonstrate that verbal elements of an interaction contribute to better accuracy, than nonverbal elements. Physiological synchronization between people has also been used to measure empathy accuracy. Researchers like Levenson and Gottman [45] studied the physiological responses of marital couples through sensors measuring heart rate, skin conductance, and facial muscle activity for detecting affective empathy and understanding empathic accuracy. Neurosciences also demonstrated the link between emotion recognition and affective brain region [104].

Chang-Arana et al. [9] studied empathy in the design process using the empathic accuracy technique. After interviewing users, the users were asked to watch the video recording and describe their thoughts during the key moments of the interviews. A few weeks later, designers were shown the recording videos and were asked to infer the users' thoughts at each key moment. Chang-Arana et al. [9] compared the similarities on a 3-point scale. The researchers found the technique adequate to measure designers' empathy; however, it was time-consuming.

Recently, Li et al. [47] and Li and Hölttä-Otto [46] also applied Ickes' method in a design context through a shorter protocol, including three parts: an interview between designers and users, an inferring part (feelings and emotional recognition), and an evaluation part (raters rating of the similarities). The researchers investigated designers' empathy accuracy through a mixed-methods approach: the Ickes' paradigm and physiological synchronization. Li and Hölttä-Otto [46] found that designers' emotional accuracy impacts their performance in understanding users' needs. More experimental research investigates the feasibility of measuring empathy between designers and users during interviews by comparing autonomic nervous system synchrony with the heart rate [9].

While empathic accuracy techniques in design have only been used to assess designers' empathy, the technique might also help to assess other stakeholders' empathy, like service employees.

2.3 Research Objectives

In this paper, we explore how the audio playback of L&B declarations can prompt service employees' empathy toward users. As employees are confronted with the real voice of passengers expressing their frustrations, satisfactions, or needs, we consider L&B declarations as an emotional way to convey user insights [24, 43, 86]. The characteristics of the method, using storytelling [5], raw data [78], with a sensorial modality (i.e., the audio) and playful dimension corresponds to what the literature describes as empathic properties [36]. We investigate the following research questions:

- **RQ1: Do love and breakup declarations prompt service employees' empathy towards users?**
- **RQ2: What individual factors influence employees' empathy when listening to L&B declarations?**

To assess whether and how L&B declarations can impact employees' empathy, we measured participants' empathy before and after listening to the users' declarations. We investigated what users' insights the employees recall from the declarations. We gathered the employees' preference between L&B declarations and traditional marketing-oriented user insights from satisfaction surveys and customers' complaints. We also aimed to understand whether

Table 1: Main techniques to convey user insights in design

Techniques	Medium	Data type	Description
Ethnographic techniques	Observation	Raw data	When designers conduct interviews, observations, and focus groups, other stakeholders can observe the sessions (hidden observations, [60]).
	Multimedia	Raw data	Multimedia material is increasingly used to help designers step into users' worlds. Their format varies from recordings of life instants to compilation of videos from user research (also called empathy videos [57, 94] and design documentaries [67]).
	Probes	Raw data	Design, cultural, or empathy probes are users' self-documentation of their experience. It sparks a dialogic process with users [54]. Probes include tangible user insights under various formats like love letters, diaries, pictures, notes.
Mapping techniques	Printouts journey maps empathy maps personae	Aggregated data	These techniques synthesize user research findings and visualize the experience to facilitate the understanding of users [64, 83, 98]. They map the context of use [31, 80] and simplify the complexity of systems and organizations. Maps can be displayed in a dedicated space [35] where people interact with the material [60], triggering empathic responses and inspiring new concepts [42, 55].
Simulation techniques	Simulators	Aggregated, fictional data	Simulation techniques simulate users' worlds. These techniques enhance design creativity and empathy [68]. Simulation techniques have been used to design for older adults or people with disabilities (e.g., [8, 58]).
	Virtual Reality (VR)	Aggregated, fictional data	VR triggers an emotional engagement motivating perspective-taking and appealing to affective empathy [101]. VR supports designers' empathy towards users [28] and helps them to identify real problems to imagine solutions [59, 90]. One can find examples in healthcare research [20, 74] or social design [22].
	Games	Aggregated, fictional data	Games mediate others' perspectives and support empathy through role-play [93]. Their qualities have the potential to impact society [61].
Collaborative techniques	Direct contact	Raw data/ real context	The direct contact with users during codesign sessions significantly increases the quality of user-centered solutions [96].

employees can recognize the emotions expressed by the passengers, whether these emotions resonate with their own, and whether these, in turn, influence employees' perceived learning about passengers, interest in passengers, and ability to help improve the passenger experience. Following prior work, we consider these related measures as indicators of empathy.

3 METHOD

In a preliminary study, we interviewed 53 passengers using the L&B method to gather their experience with their railway service [17]. We chose this method to collect emotional and engaging passenger insights [1, 24], with the potential to stimulate empathy from the service employees toward the users [97]. Combining approaches from design probes [23, 53], letters to objects and services [13, 56, 63], and roleplaying [24, 40], the L&B method invites people to reflect on their experiences [73] and elicit recites [23]. In the present study, we played back six of the passengers' declarations to the railway company employees during a presentation of the study's results. These declarations are raw data reflecting the user

experience (Figure 1). We invited the employees to answer questions about the declarations through a questionnaire. Making the employees listen to the passengers' declarations aimed to assess their empathy towards the passengers in four ways: (1) their emotional recognition — empathic accuracy [9], (2) their emotional resonance with passengers, (3) their memorability of passengers' insights [42], and (4) their perceived learning about passengers, interest in passengers, ability to help improve the passenger experience, and empathy towards passengers (measures inspired by Sleeswijk Visser and Kouprie [79] research).

3.1 Participants

356 employees from the National Railway Company in Luxembourg, mostly frontline employees, attended one of 16 company information sessions. While the sessions were mandatory, participation in the study was voluntary, and informed consent was collected. 328 employees (92% of the sample) participated in the questionnaire, but 66 did not consent to use their answers and were not included. 32 answers were additionally excluded because of failure to an attention check item. Our final sample of N=230 employees (age

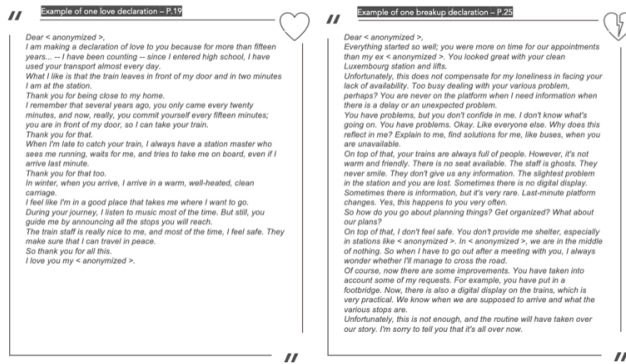


Figure 1: Examples of Love and Breakup declarations from the railway passengers (translated in English)

range 18 to 60, $M = 37$, $SD = 11.17$) entailed 135 men, 73 women, 1 non-binary, and 10 preferred not to answer. 28% use the train regularly and 66% use another regular mode of transportation. 76% of the employees participating in this study declared working in proximity with passengers. Their seniority in the company ranged from less than a year to 37 years ($M = 11.17$, $SD = 8.28$). This study was approved by the University of Luxembourg ethics review panel.

3.2 Procedure

The sessions took place in person at the company headquarters. Each session lasted around 45 min as part of a mandatory two-hour session about the department's vision and customer satisfaction. Our protocol included four steps (Figure 2).

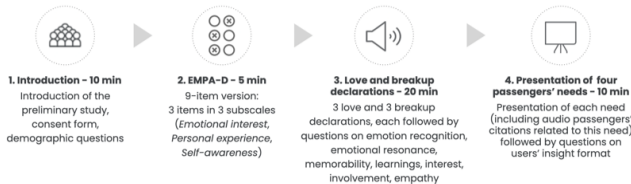


Figure 2: Four-stage session protocol

First, we briefly introduced how the passengers' declarations were collected during the preliminary study [17]. We collected employees' age, gender, seniority in the company, regular proximity with passengers (Yes/No), and main transportation mode (train versus other modes). Second, we administered the 9-item Empathy in Design Scale (EMPA-D, [15, 17]) as a baseline to measure employees' empathy towards passengers. Third, we played back three love and three breakup declarations, selected out of the 53 declarations collected from the passengers. We started with a love declaration, to avoid demotivating employees or creating reactance.

For each declaration, we invited the employees to recognize which emotions the passengers expressed in their declaration (Figure 4). We then asked the employees to share their emotions while listening to the six declarations. Last, participants shared which passengers' insights they memorized and answered questions on their

perceived learning about passengers, their interest, involvement, and empathy towards passengers (Table 2).

Fourth, we introduced four passengers' needs to the employees (resulting from the analysis of the passengers' declarations, Figure 3) and played-back a compilation of passenger audio illustrating these needs. Then, we surveyed the employees about the user insights format they found relevant (Table 2).

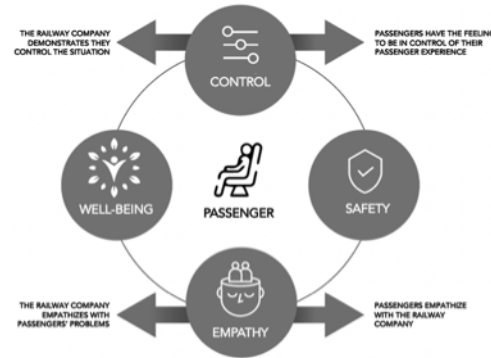


Figure 3: Passengers' needs based on the preliminary study

3.3 Material

3.3.1 *Empathy in Design scale (EMPA-D) 9-item version.* Before sharing passengers' declarations, we administered the 9-item EMPA-D scale by Drouet et al. [15] (Cronbach's $\alpha = .88$, Table 3). EMPA-D [16] measures employees' empathy towards users in the service design context using three subscales.

- *Emotional interest:* "employees imagining how users think and feel, and employees' curiosity about the users, resulting in a willingness to explore and discover the users, their situations and experiences"
- *Personal experience:* "resonating with users, and connecting with them on an emotional level, by recalling explicitly upon employees' own memories and experiences in order to reflect and be able to create an understanding"
- *Self-awareness:* "distinguishing between the representations of employees' actions, perceptions, sensations and emotions, and those of users"

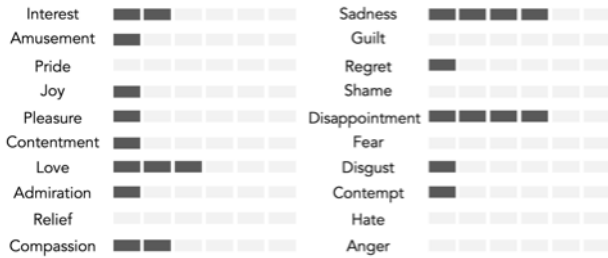
Statements are rated on a 7-point scale, from 1 (Does not describe me at all) to 7 (Completely describes me).

3.3.2 *Emotion recognition and emotional resonance.* To assess employees' empathic accuracy [9], we asked employees to recognize the emotions expressed by the passengers in each declaration (Q1 in Table 2). The twenty emotions (and an option to select none) are based on the Geneva Emotion Wheel [75, 92] — which was also filled by passengers after their declarations, which allows to compare passengers' replies with employees'. The same tool was used to assess emotional resonance by asking the employees to select the emotions they felt while listening to the declaration (Q2).

3.3.3 *Memorability of passengers' insights.* To assess the memorability of passengers' insights, employees were asked to freely recall three main ideas shared by the passengers in the declarations (Q3).

Table 2: Questions about the L&B declarations and preferred user insights format

Questions	
Q1	After each declaration: emotional recognition (multiple choice from a list of 20 emotions with a none option) (repeated Q1 after each audio declaration, six times in total) What emotions does the passenger express? Choose the corresponding emotions from the list.
Q2	After the six declarations: emotional resonance (multiple choice from a list of 20 emotions with a none option) What emotions did you feel when hearing these six declarations? Choose the corresponding emotions from the list.
Q3	Memorability (open text field) Cite three main ideas shared by passengers that you remember from listening to these declarations. This could be a word, a phrase, or an anecdote.
Q4	Measures of perceived learning, interest, ability to help, and empathy (7-point Likert scale) On a scale of 1 to 7, how would you rate...
Q5	...that these declarations taught you anything about passengers? (1 - "Nothing," 7 - "A lot")
Q6	...your interest in these passengers' declarations? (1 - "No interest," 7 - "High interest")
Q7	...your ability to help improve the experience of these passengers? (1 - "No ability," 7 - "Strong ability")
Q8	...your level of empathy (=putting yourself in the other person's shoes) for these passengers? (1 - "No empathy," 7 - "High empathy")
Q9	Ranking of user insights format What type of customer feedback about the passenger experience interests you the most?
Q10	What type of customer feedback about the passenger experience makes you feel you can help improve the passenger experience?
Q10	What type of customer feedback about the passenger experience makes you more empathic?

**Figure 4: Example of passengers' emotions selected (including their intensity) after a breakup declaration (P25)**

3.3.4 Measures of perceived learning, interest, ability to help, and empathy. Adapted from Sleeswijk Visser and Kouprie [79], employees rated on a 7-point scale their level of learning about passengers (Q4), interest in passengers (Q5), ability to help improve the passenger experience (Q6), and empathy towards passengers (Q7).

3.3.5 Ranking of user insights formats. To assess the most relevant user insights format to trigger empathy, we then asked the employees to rank which of four formats (customers' complaints, customer satisfaction statistics, love declaration, and breakup declaration) was triggering the most employees' perceived interest in passengers (Q8), ability to help improve the passenger experience (Q9), and empathy towards passengers (Q10).

3.4 Data Analysis

We conducted the statistical analysis with SPSS v.27. We checked the data for outliers and entry errors. We ran univariate statistics to examine each item and question means and standard deviations. We computed a percentage of emotion recognition and a percentage of emotional resonance to investigate how the employees succeed

in recognizing passengers' emotions and how their emotions resonated with those of passengers. We based these percentages only on the most intense emotions selected by the passengers in their declaration (L1: 4 emotions, B1: 3 emotions, L2: 4 emotions, B2: 3 emotions, L3: 5 emotions, B3: 1 emotion).

4 RESULTS

4.1 Does Employees' Empathy Change after Listening to L&B Declarations?

On average, employees had an initial empathy score (using the 9-item EMPA-D scale [15]) of 5 out of 7 (Min = 1, Max = 6.89, SD = 0.98). The reliability estimates suggest that EMPA-D and its sub-scales have good or acceptable levels of internal consistency in the current sample ($n = 227$, Table 3). The dimension rated as the highest is Self-awareness ($M = 5.22$, $SD = 1.12$), the lowest Personal Experience ($M = 4.71$, $SD = 1.10$). We ran a Wilcoxon signed-rank test to compare the medians between the initial measure of empathy (EMPA-D scale) and the post-declaration empathy measure (Q7). This test determines the effect of listening to the passengers' declarations on employees' empathy levels (Table 4). The difference scores were approximately symmetrically distributed, as assessed by a histogram with a superimposed normal curve (Figure 5). Listening to passengers' declarations elicited a decrease in empathy in 90 employees (out of 220), whereas 66 employees showed an empathy improvement and 64 no change. Contrary to our hypotheses, there is a statistically significant decrease in empathy level ($Mdn = 1.11$) between the first ($Mdn = 5$) and the second measure of empathy ($Mdn = 4.69$), $z = -2.49$, $p = .013$.

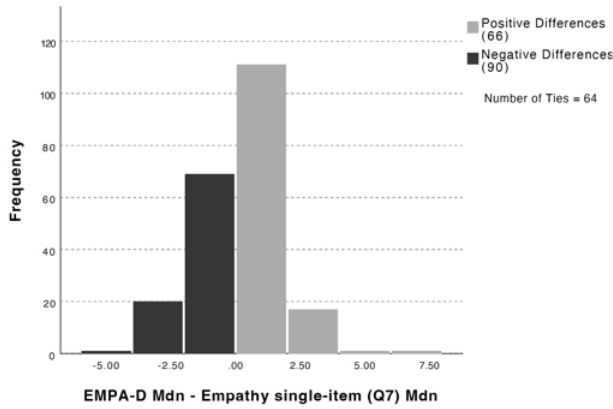
4.1.1 Measures of perceived learning, interest, ability to help, and empathy. Employees' ratings related to their perceived learning about, interest in passengers, and ability to help improve the passenger experience are all mainly neutral, with medians and modes

Table 3: Descriptive statistics and alpha reliabilities of EMPA-D subscales, n=227

EMPA-D Subscale	Items	Min	Max	M	SD	α
Emotional interest	3	1	7	5.05	1.30	.88
Personal experience	3	1	7	4.71	1.10	.72
Self-awareness	3	1	7	5.22	1.12	.75
EMPA-D Total	9	1	6.9	5	0.98	.88

Table 4: Median values and Wilcoxon Signed Rank test - EMPA-D and post-declaration empathy measure (Q7)

	n	Mdn	z	p
EMPA-D	227	5		
Empathy post-declaration (Q7)	223	4.69		
Empathy level difference	220	1.11		
Related-Samples (EMPA-D and Q7)	220		-2.49	.013

**Figure 5: Related-samples Wilcoxon Signed Rank test**

between 4 and 5 (Table 5). Employees felt less like they were learning about the passengers while listening to the declarations ($M = 3.36$, $SD = 1.57$) than they felt able to help ($M = 4.27$, $SD = 1.53$), interested ($M = 4.47$, $SD = 1.52$) or empathic ($M = 4.69$, $SD = 1.64$). We found moderate point-biserial correlations between these indicators of empathy. The stronger correlations are between the employees' interest and ability to help, $r = .582$, $p < .001$, and their empathy, $r = .656$, $p < .001$. The lowest correlation is between the employees' perceived learning and empathy, $r = .357$, $p < .001$.

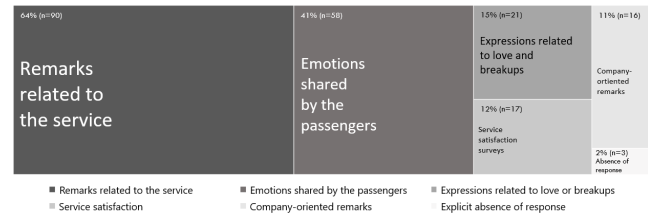
4.2 What Did Employees Memorize from the L&B Declarations?

We conducted a thematic analysis on the insights that the employees ($n = 141$, 61% response rate) recalled from the passengers' declarations, resulting in six themes (Figure 6): (a) remarks related to the service (e.g., delays, the staff smiling, improvements noticed), (b) emotions shared by the passengers (e.g., "compassion"), (c) passengers' comments about the service satisfaction, (d) expressions

Table 5: Descriptive statistics of the employees' perceived learning, interest, ability to help, and empathy

Employees' perceived...	n	Min	Max	M	SD
learning	217	1	7	3.36	1.57
interest	209	1	7	4.47	1.52
ability to help	221	1	7	4.27	1.53
empathy	223	1	7	4.69	1.64

related to love or breakups (e.g., "I love you"), (e) company-oriented remarks (e.g., interpretation of passengers' declarations: "the customers are still positive"), and (f) explicit absence of response (e.g., "nothing"). Employees mainly memorized remarks related to the service, with 64% of the employees mentioning at least one. 41% of employees mentioned at least one answer related to passengers' emotions. More answers were related to positive emotions ($n = 48$, e.g., "proud, relief, joy," "interest, joy, grateful") than negative ones ($n = 35$, e.g., "deception, sadness"). Some employees recalled both positive and negative emotions ($n = 25$). To a lesser extent, 15% of employees recalled insights related to the vocabulary of love or breakup declarations.

**Figure 6: Type of passengers' insights memorized by the employees (n = 141)**

4.3 What is Employees' Preferred User Insights Format to Empathize with Users?

We asked employees to rank four types of user insights according to the following criteria: which ones they found the most interesting, which ones make them feel they can help improve the passenger experience, and which ones make them more empathic (Figure 7).

Regarding interest, 64% of employees ranked the passengers' declarations (equally between love and breakup) as the user insights that interest them the most. The interest in love declarations is ambivalent as it is both ranked by 32% of respondents as the format triggering the most interest and ranked by 32% of respondents as the format triggering the least interest. Breakup declarations are ranked first and second place (32% and 37%, respectively), emphasizing their potential to trigger employee interest.

When asked what form of user insights makes them feel they can help improve the passenger experience, employees surprisingly rated customers' complaints as one of the least useful, often ranked last (61%) of the four formats suggested. Unlike customer complaints, love declarations motivated employees to help passengers and were ranked first in 59%

Finally, 40% of employees ranked the breakup declarations in 1st position to trigger their empathy, as opposed to the love declarations, which were mainly ranked last, in the 4th position in 37% of cases. Customers' complaints are often ranked in the second position (39%), which could reflect that negative feedback is perceived as having more power to trigger empathy than positive feedback.

4.4 What Individual Factors Influence Employees' Empathy?

Following prior literature in service research and user-centered design [46, 88], we investigate the influence of three main individual factors on the various measures indicators of empathy collected: the employees' level of seniority inside the company, their personal experience as users of the service (train passengers), and their regular proximity with passengers as part of their job missions.

Table 6: Point-biserial correlations between seniority, emotion recognition and resonance, and empathy indicators

	Seniority (n = 228)	Sig.
EMPA-D Total	.055	.409
Emotional recognition Total	-.116	.080
Emotional recognition Love	-.106	.112
Emotional recognition Breakup	-.107	.107
Emotional resonance Total	.120	.070
Emotional resonance Love	.199**	.003
Emotional resonance Breakup	.028	.670
Learning	-.041	.548
Interest	.091	.191
Ability to help	-.054	.427
Empathy	.013	.850

** Correlation is significant at the 0.01 level (2-tailed).

4.4.1 Emotional recognition and emotional resonance. Overall, our participants recognized slightly more than half of the emotions (53%) expressed by the passengers, with a higher percentage for breakup declarations (58%) than love declarations (48%). When listening to the declarations, employees' emotions have little resonance with passengers' emotions, with $M = 10\%$ ($SD = 18\%$) overlap on average (Table 7). There was no significant correlation between emotional recognition and resonance ($r = .127$, $p = .055$). We found very weak correlations between emotional recognition and employees' interest, $r = .199$, $p = .004$, employees' empathy (Q7), $r = .185$, $p = .006$, and ability to help, $r = .169$, $p = .012$. We found no correlations between emotional resonance and these four indicators.

4.4.2 Influence of employees' seniority inside the company. We first ran a point-biserial correlation to explore the relationships between the employees' seniority and all measures of empathy (Table 6). Apart from a very weak correlation between employees' seniority and the emotional resonance with the love declarations ($r = .199$, $p = .003$), no significant relation between seniority and the other measures of empathy was found in our sample.

4.4.3 Influence of employees' personal experience as a train passenger. We run independent samples T-tests to investigate the differences between employees using the train regularly and those not using it (dichotomous variable), on the scores of emotional recognition and resonance, and the other measures indicators of empathy. If, at the descriptive level, the emotional resonance seems slightly higher for the employees using the train ($M = 13\%$, $SD = 21\%$) than for those not using the train ($M = 9\%$, $SD = 18\%$, Table 8, we did not find significant differences between the two groups of employees for the emotional recognition.

We found a significant difference between employees using the train and those not using the train on the employees' interest in passengers and empathy rating. Employees using the train had significantly higher scores of interest ($M = 4.90$, $SD = 1.45$, Table 9) than those not using this mode of transportation regularly ($M = 4.35$, $SD = 1.54$), $t(96) = 2.30$, $p = .023$. Similarly, they had significantly higher scores of empathy ($M = 5.10$) than the other employees ($M = 4.54$), $t(204) = 2.224$, $p = .027$. We, however, did not find significant differences between the two groups on the perception that employees learned things about the passengers or their perceived ability to help improve the passenger experience.

4.4.4 Influence of employees' proximity with passengers. We run independent samples T-tests to investigate the differences between the employees working in proximity with passengers and those whose jobs do not involve contact with passengers, on the scores of emotional recognition and resonance, and the other measures indicators of empathy. At the descriptive level, employees in regular contact with passengers got slightly higher percentages of emotional recognition on average ($M = 54\%$, $SD = 22\%$, Table 10) than employees with no proximity to passengers ($M = 50\%$, $SD = 24\%$). Employees' emotional resonance seems to follow an opposite trend at the descriptive level and is slightly higher for those not working in proximity with passengers ($M = 14\%$, $SD = 22\%$) vs. working in proximity with passengers ($M = 9\%$, $SD = 17\%$). Regarding the employees' proximity with passengers, we did not find significant differences between the two groups of employees and any of the variables of interest, namely emotional recognition, emotional resonance, employees' interest, learning about passengers, perceived ability to help, or empathy after listening to the declarations.

4.4.5 Influence of initial EMPA-D score. We investigated the influence of the initial EMPA-D score on the scores of emotional recognition and resonance, and the other indicators of empathy by running point-biserial correlations and linear regressions to investigate the model prediction of EMPA-D score with other variables.

First, we found very weak correlations between EMPA-D and emotional recognition, $r = .153$, $p = .021$ or emotional resonance, $r = .274$, $p = <.001$. We run a linear regression to investigate the model prediction of EMPA-D score with employees' emotional recognition and emotional resonance scores. Employees' EMPA-D initial score accounted for 2.3% of explained variability of employees' emotional recognition, $F(1, 223) = 5.41$, $p = .021$. It accounted for 7.5% of explained variability of employees' emotional resonance $F(1, 225) = 18.29$, $p = <.001$, $(-15.27 + 5.10)$. We found weak to moderate correlations between EMPA-D and employees' learning, $r = .413$, $p = <.001$, employees' interest, $r = .555$, $p = <.001$, ability to help, $r = .388$, $p = <.001$, and post-declaration measure of empathy (Q7), $r =$

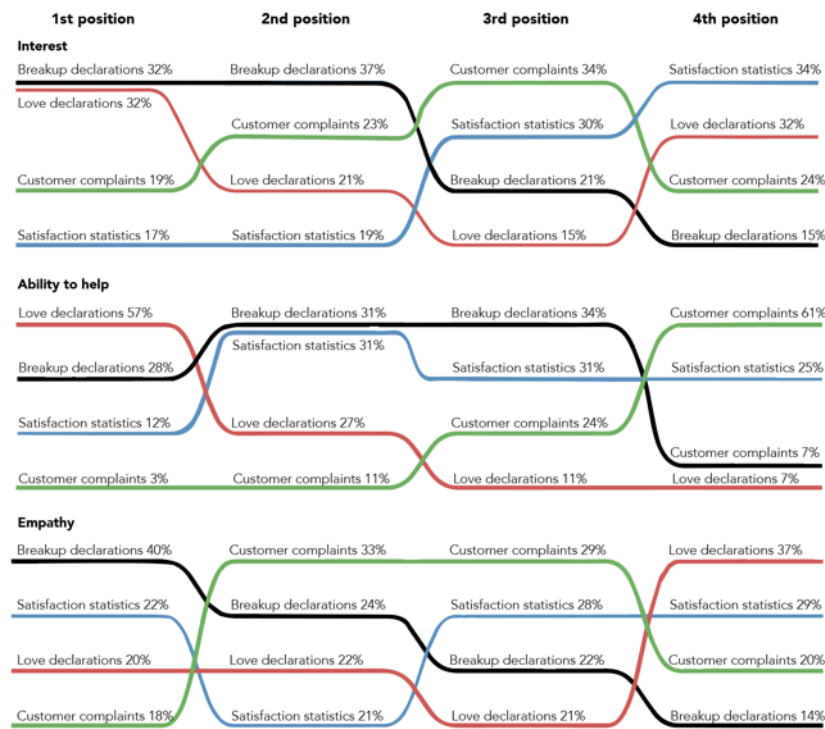


Figure 7: Ranking the user insights formats for interest, ability to help, and empathy

Table 7: Descriptive statistics of the employees' emotional resonance with passengers' emotions

Id. of declaration	n	Number of emotions selected by the employees				% emotional resonance by the employees			
		Min	Max	M	SD	Min	Max	M	SD
Love declarations									
L1	83	1	7	2.46	1.83	0	100	10	21
L2	80	1	8	2.89	2.11	0	100	13	25
L3	81	1	11	2.95	2.55	0	100	9	20
Total Love	84	1	7.33	2.81	1.90	0	93	11	19
Breakup declarations									
B1	79	1	10	2.29	1.86	0	100	10	22
B2	79	1	10	2.48	1.90	0	100	7	18
B3	81	1	9	2.07	1.64	0	100	12	32
Total Breakup	84	1	8.67	2.28	1.55	0	89	9	20
Total declarations	84	1	7.67	2.54	1.60	0	77	10	18

.379, $p = <.001$. Looking at the subdimensions of EMPA-D, we also found correlations with all other indicators of empathy. Regarding the simple linear regressions, the EMPA-D score accounted for:

- 17.1% of explained variability of employees' learning, $F(1, 212) = 43.66$, $p = <.001$. The fitted regression model was: predicted employees' learning = $.339 + .665$ (EMPA-D score);
- 30.8% of explained variability of employees' interest, $F(1, 204) = 90.92$, $p = <.001$. The fitted regression model was: predicted employees' interest = $.214 + .862$ (EMPA-D score);
- 15% of explained variability of employees' ability to help improve the passenger experience, $F(1, 216) = 38.26$, $p = <.001$. The fitted regression model was: predicted employees' ability to help = $1.22 + .614$ (EMPA-D score);
- 14.4% of explained variability of employees' empathy after listening to the declarations, $F(1, 218) = 36.60$, $p = <.001$. The fitted regression model was: predicted employees' empathy = $1.522 + .639$ (EMPA-D score).

Table 8: Independent samples T-tests between train use and employees' emotional recognition and resonance, and self-reported indicators of empathy

		Descriptive statistics			T-test		Sig. (2-tailed)	Mean difference
		n	M	SD	t	df		
Emotional recognition	Train	60	53	24	-0.09	211	.930	-.31
	Other transport	153	54	22				
Emotional resonance	Train	60	13	21	1.30	95.65	.198	3.9
	Other transport	153	9	18				
Learning	Train	59	3.93	1.55	1.74	199	.083	.42
	Other transport	142	3.51	1.55				
Interest	Train	52	4.90	1.45	2.30	96.24	.023	.55
	Other transport	141	4.35	1.54				
Ability to help	Train	58	4.47	1.70	0.91	203	.366	.21
	Other transport	147	4.25	1.45				
Empathy	Train	59	5.10	1.47	2.22	204	.027	.56
	Other transport	147	4.54	1.69				

** Correlation is significant at the 0.01 level (2-tailed).

Table 9: Descriptive statistics of emotional recognition and resonance based on employees' train use and proximity with passengers

	% emotional recognition				% emotional resonance				% emotional recognition				% emotional resonance			
	Min	Max	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max	M	SD
n = 213	Using the train (n = 60)								Not using the train (n = 153)							
Love	0	100	49	24	0	77	14	21	0	100	48	23	0	93	10	19
Breakup	0	100	58	28	0	78	12	23	0	100	59	26	0	89	9	20
All declarations	0	95	53	24	0	75	13	21	3	95	54	22	0	77	9	18
n = 209	Proximity with passengers (n = 158)								No proximity with passengers (n = 51)							
Love	0	100	49	23	0	72	9	13	0	87	46	22	0	77	15	21
Breakup	0	100	60	26	0	89	9	20	0	100	55	30	0	67	14	24
All declarations	0	95	54	22	0	77	9	17	0	88	50	24	0	72	14	22

Table 10: Independent samples T-tests between proximity with passengers and employees' emotional recognition and resonance, and self-reported indicators of empathy.

		Descriptive statistics			T-test		Sig. (2-tailed)	Mean difference
		n	M	SD	t	df		
Emotional Recognition	Proximity	158	54	22	1	80.94	.304	3.77
	No proximity	51	50	24				
Emotional Resonance	Proximity	158	9	17	-1.68	71.61	.098	-5.54
	No proximity	51	14	22				
Learning	Proximity	150	3.61	1.51	-.56	68.23	.580	-.16
	No proximity	47	3.77	1.77				
Interest	Proximity	147	4.37	1.45	-1.73	61.80	.089	-.49
	No proximity	43	4.86	1.67				
Ability to help	Proximity	153	4.28	1.51	.34	71.02	.736	.09
	No proximity	48	4.19	1.72				
Empathy	Proximity	154	4.60	1.63	-1.41	201	.161	-.38
	No proximity	49	4.98	1.63				

5 DISCUSSION

In this paper, we studied the audio playback of six L&B declarations to trigger service employees' empathy toward users. Among storytelling techniques, we choose the love and breakup method as part of the design probes to spark a dialogic process with users [54]. We quantitatively assessed employees' empathy and investigated other measures indicators of empathy (emotional recognition and resonance, employees' perceived learning, interest, and ability to help). We also explored passengers' insights memorized by the employees. Furthermore, we investigated which format of user insights the employees perceived as most relevant between the declarations and traditional marketing ones (i.e., customers' complaints and satisfaction statistics). Last, we explored the employees' individual and contextual factors influencing empathy.

First, we discuss the observed tendency for decreased empathy and the factors that might explain it. Then, we discuss the impact of the love and breakup method on employees' empathy.

Prior work on empathic design describes design probes techniques supporting empathy in design, such as the love and breakup method [36, 54]. These are rather documented in a generic and positivist way, with little elaboration on what mechanisms trigger empathy or in which contexts [19]. In the present study, we observed a quantitative decrease in empathy for most employees after listening to the passengers' declarations. We even observed that passengers' breakup declarations generated some revolting comments among a few employees (e.g., "this is stupid," "seriously?"). These reactions might hint at a potential counterproductive effect of using L&B declarations to trigger empathy. This decrease, however, is not so surprising, as it echoes previous studies in engineering about empathy education programs [3, 49]. Why would listening to users' declarations decrease service employees' empathy? We discuss multiple explanations.

5.1 The Influence of the Study Context

First, the user experience maturity context [11] within the railway company was low. Our empathic design intervention was the first conducted within this company, and at a large scale. Most employees encountered creative users' insights like the L&B declarations for the first time and were equally unfamiliar with reflecting on passengers' emotions. Overall, the railway sector is not used to qualitative passenger insights [17, 70]. Few researchers investigated passenger experience through emotional prisms [39, 91, 95]; most of the transportation research is based on quantitative metrics from satisfaction surveys (e.g., [4, 14]) or passenger behaviors metrics (e.g., [21, 105]). The workforce is thus more used to hearing about passengers' satisfaction or dissatisfaction through self-reported surveys than to getting the "why" behind passengers' ratings. We can hypothesize that initial empathic interventions in low-maturity contexts do not produce immediate observable results [18] and that the percentage of employees who showed increased empathy (43%) is rather promising. Our observations might echo Penin [64]'s description of emotional labor as often not being compensated enough in service jobs. In this case, asking employees to empathize with users when they do not feel listened to is challenging. Empathic interventions such as the one described in our case study should be seen as the first step in a long-term project. Applying empathic

methods within an organization would require setting up an open mindset [72], staging the activities, communicating the value of empathic understanding [65], and managing stakeholders' expectations [51] (e.g., professional learnings [99]). Confidence in the approach and those involved is also necessary for the stakeholders to adopt an empathic understanding. This is built up over time and through the recurrence of interventions. Deploying empathic interventions in smaller groups [65] could have increased the adoption of the declarations. For instance, the Smart Design agency at the origin of the L&B method asked the authors of the declarations to read them in groups, leading to a discussion about the shared user experiences.

Other factors might also explain the decreased empathy observed, for instance, additional contextual factors [41] or the nature of the user insights format. Indeed, raw data is less intelligible for stakeholders without a research background [51, 65]. The transferability of user insights to solutions requires researcher skills. Finally, the setup of the activity might also have played a role in the decrease. After each emotional recognition exercise, we shared with the participants which emotions the passengers had felt. When their answers did not correspond to those of the passengers, the employees might have perceived themselves as less empathic than before the intervention.

5.2 The Role of Individual Factors

While contextual and organizational factors may explain employees' decrease in empathy, it is useful to investigate the role of individual factors. The correlation between our measures of employees' interest, ability to help, and empathy (post-declaration measure, Q7) might suggest that employees who are interested in the problems shared by the passengers show more empathy and desire to improve the service experience. This resonates with the mechanism described in empathy frameworks in design [26, 37, 82]. Designers first develop an interest in users to step into the users' world [37]. Furthermore, the influence of employees' initial empathy level on interest or ability to help aligns with previous empirical work (e.g., [79] showing that initial empathy towards users impacts the employees' motivation to take action to enhance the service experience).

The personal experience of employees as service users influenced the interest and empathy rating after listening to the declarations. These findings echo [82]'s description of the personal experience stage of their empathy in design framework — "connecting to own experiences and feelings" and as a factor in fostering empathy. In the literature on generative tools literature, emotional techniques often elicit memories and have users reflect on their experiences with products and services [73]. This might explain why personal experience influences the employees' empathy. This also resonates with the connection stage described by Kouprie and Sleeswijk Visser [37]: "resonating with the user, achieve emotional resonance and find meaning."

Contrary to previous work (e.g., [27, 99]), we did not find a link between employees' seniority and empathy. Hess et al. [27] found that experienced engineers value empathy and care better, while novices tend to make assumptions about users [99]. However, these previous studies investigated seniority in terms of professional

experience when we enquired about seniority within the organization. Similarly, while previous research demonstrated the positive impact of direct contact with users on empathy [37, 96], we did not find an influence of regular proximity with passengers on employees' empathy. Future work could explore additional individual and organizational characteristics that might act as moderators of empathy. Fair retribution, job security and stability, relationships with co-workers, or group-level norms and influences can influence people's reactions to the intervention.

5.3 Reflections on the Use of the L&B Declarations Method in Service Design

Based on prior work on the L&B method [24, 43, 86], we assumed that L&B declarations would trigger employees' emotions and empathy. Gerber [24] argues that L&B techniques produce emotional and engaging users' insights. Indeed, through the memorization exercise, we observed that employees best recalled passengers' emotions (41% of the memorized passengers' insights — with a better score for positive emotions) and concrete remarks about the service (64%). Passengers' emotions however resonated only a little with employees. Unlike designers who are personally engaged through the empathic design process [36, 37, 82], we could postulate that employees have limited use of affective empathy. This difference between designers' and employees' empathic behaviors is not necessarily problematic, as the goal of such an approach is not to turn employees into designers. Triggering state empathy is enough to support an empathic approach within an organization. Furthermore, the little emotional resonance could also be understood as a positive result. Indeed, anger emotions inhibit state empathy activation and develop barriers to recognizing and adopting others' points of view [76, 77]. For instance, if the employees resonated too strongly with breakup declarations, it would have reduced their ability to empathize with passengers.

When comparing the declarations with traditional marketing formats of user insights (i.e., satisfaction statistics and customers' complaints), our employees perceived the love declarations as better supporting their ability to help improve the passenger experience. The love declarations perhaps share smaller issues to fix and a generally positive attitude that motivates employees' prosocial behaviors. Love letter writers use hyperboles to express polite negative feedback to point readers' attention to what matters [2]. Love declarations could also be more audible for the employees than breakup declarations, echoing the company's internal observation that complaints demotivate employees. Nevertheless, the breakup declarations triggered most employees' empathy, contrary to the love declarations. People who love the service might be perceived as less in need because they are already satisfied.

Overall, the L&B declarations are perceived by employees as the most interesting user insights among the proposed choices. Interestingly, 15% of memorable passengers' insights cited by our employees directly quote love and breakup expressions used by the passengers. This is perhaps due to the method's novelty or likeliness to entail personal anecdotes. The playfulness of user insights is one of the nine qualities (e.g., inspiring, memorable, experiential) supporting the actionability of design research [71].

Although we did not observe an increase in empathy for all employees, the L&B declarations became a strong symbol of user experience value within the company. Following the study, managers have reused users' declarations during internal training sessions and meetings to support a user-centric approach when making decisions about the future of the service. It echoes the transformative power of techniques to convey user insights described by Rutkowska et al. [71]. We refer the interested reader to our reflective paper summarizing the empathic design process applied in this company [18].

6 LIMITATIONS AND FUTURE WORK

Our work involves several limitations. The participation of employees in our study was mandatory; consequently, our results are subject to selection, non-response, and social desirability biases [38]. Moreover, the study occurred in the company's headquarters building, with heterogeneous profiles mixing managers and employees, which might also lead to social desirability. To counteract these, we extensively explained before the session that replying to our questions was not mandatory, the data collected would not be shared with the company, and the answers were anonymized. Noteworthy, 66 did not give consent to participate in the research. It is hard to know whether this results from concerns about sharing data with researchers associated with their hierarchy, a refusal to engage in the research, or simply a lack of attention to the checkbox in the form. As explained in a published reflective paper on this 3-year empathic design intervention within this company [18], a large group effect with employees openly demonstrating their skepticism might have biased our findings; smaller groups could have limited this bias. The level of employees' involvement in the topics shared by the passengers in their declarations might also bias the empathy effect of the method: the impact can differ whether a user comments on a topic very related or, conversely, completely unrelated to one's task. According to [78], the connection in the project is needed to build empathy. Furthermore, some employees were fluent but non-native speakers of the language in which the study was conducted; possible misunderstanding of the contents presented might have impacted the results.

Despite all the field constraints encountered, we encourage the research community to study empathy in service design in the real context of organizations. Methods to trigger stakeholders' empathy for users are under research. While technological products and software are increasingly commercialized as embedded into services, further empirical research on empathy building in HCI would help define scopes in which other stakeholders can support user-centric approaches and design practitioners' work. On the academic side, it would deepen the understanding of empathy in design and refine models and theories of empathy.

7 CONCLUSION

In this paper, we studied the potential of L&B declarations to trigger service employees' empathy towards users. We played back to service employees' (N = 230) six passengers' declarations addressed to their railway company. Our investigations showed a nuanced impact of the L&B declarations on service employees' empathy. First, we observed a statistically significant decrease in empathy

level between the first and the second measure and discussed potential explanations for this phenomenon. Our participants mostly memorized passengers' emotions and factual remarks on the service. Individual factors such as initial employees' empathy level and personal experience with the service have impacted our results; employees using the train have a significantly higher score of interest and empathy than those not regularly using this mode of transportation. Our employees perceived the love declarations as better supporting their ability to help improve passenger experience than traditional marketing formats of user insights. The breakup declarations triggered most employees' empathy.

This work contributes to answering how to trigger empathy in service design with non-designer stakeholders. Service companies count many other professionals working on service end-user experience. To avoid these profiles from losing sight of users, finding ways of triggering empathy toward users is primordial [7]. This prevents silos organizations and communications difficulties between the teams [83, 84].

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