# WEB APPENDIX
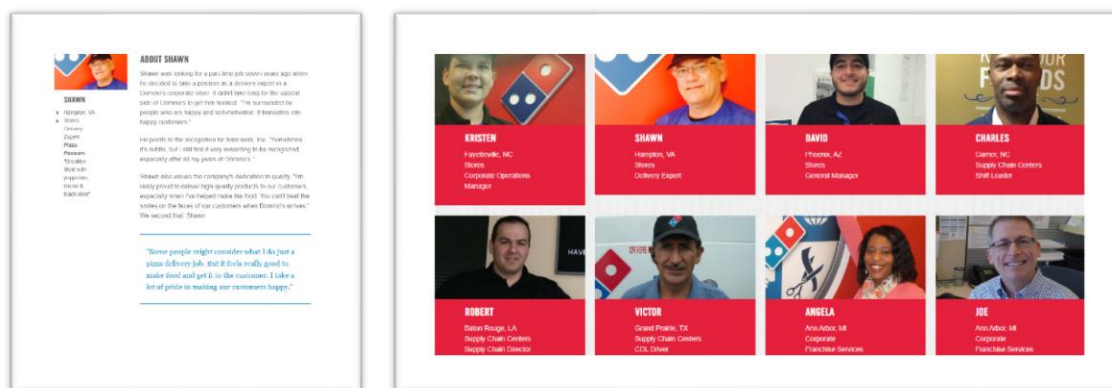
**Face Forward: How Employees' Digital Presence on Service Websites Affects
Customer Perceptions of Website and Employee Service Quality**
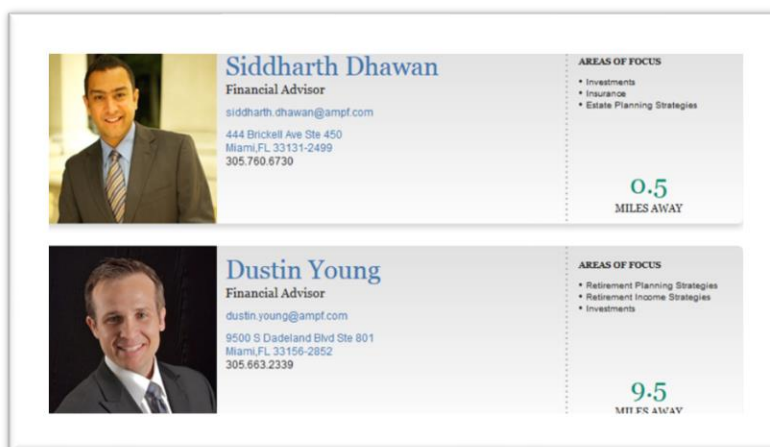
# Web Appendix 1: Examples of the Digital Presence of Service Employees
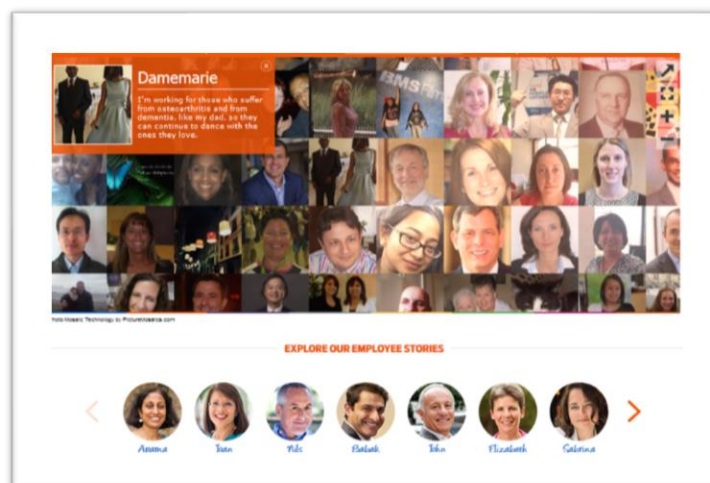
## A: Digital Presence of Service Employees at Domino's Pizza



## B: Digital Presence of Service Employees at Ameriprise



## C: Digital Presence of Service Employees at Bristol-Myers Squibb

**Web Appendix 2: Pretest on False Service Memories**

Do images and language from external cues such as websites combine with customers' original experience to influence the recalled service experience? It is conceivable that external cues expressed by the digital presence of service employees may alter memories of service experiences by making consumers remember certain aspects from the experience more strongly than others. But could they even create memories of experiences that did not occur? Previous findings from reconstructive memory research in the context of consumption experiences and childhood memories suggest that reconstructive memory processes may even create false memories (e.g., Braun 1999; Braun, Ellis, and Loftus 2002; Braun-Latour et al. 2004; Garry and Gerrie 2005; Lakshmanan and Krishnan 2009; Lindsay et al. 2004; Rajagopal and Montgomery 2011). To explore whether these findings generalize to our study context, we tested whether the digital presence of service employees might foster false memories of service experiences.

Previous research has developed a method to test for false memories by exposing individuals to cues that cannot have occurred because these cues do not exist in reality (Braun-Latour et al. 2004, Braun-Latour, Grinley, and Loftus 2006), or reasons exist why these cues could not have occurred during the time of the experience (Lakshmanan and Krishnan 2009; Lindsay et al. 2004; Wade et al. 2002). We use the latter method by identifying a new service innovation that had not been introduced in the market during the time of the experiment, and test whether displaying this service innovation with the digital presence of service employee will make consumers include it in their memory of an original service experience.

*Design, procedure, and measures.* We followed the procedures outlined by Braun-Latour et al. (2004) to test for the impact of website cues on the reconstruction of actual service experiences. Customers frequently rely on both the website (e.g., for information purpose) and

employees (e.g., during delivery) for delivery services. We thus adopt the $CO_2$-free last-mile delivery of parcel providers such as DHL as the research context. Specifically, along with Amazon and UPS, DHL recently announced to test cargo bikes in New York City (Holland and Shah 2019). However, at the time of the experiment, cargo bikes had only been tested in few European cities, and therefore DHL consumers cannot have been exposed to this service innovation in the United States.

We used a single-factor, between-subjects design manipulating cues within the digital presence of a service employee on the website (displaying the service employee on a cargo bike vs. in a delivery van). As a requirement, respondents had to have previous experience with DHL. An instructional manipulation check resulted in a screening-out of 18 participants and the final sample encompassed 182 U.S. consumers from MTurk who had a mean age of 36.1 years, and 37% of them were women. Participants were randomly exposed to the digital presence of a service employee on a cargo bike (treatment condition) or in a delivery van (control condition) on a website of DHL that all contained the same information about $CO_2$-free last-mile delivery (see Web Appendix 3). Participants were asked to carefully digest all information on the website and to evaluate the usefulness of this information on a 10-point scale ("How would you rate the usefulness of the information from the Website?"). Next, they were asked to write a few words about their own past experience with DHL as a filler task. We then examined the reconstructive memory outcome by asking participants to indicate whether they (1) had received a delivery from DHL in the past, (2) had sent a delivery via DHL to someone in the past, (3) had seen an employee of DHL with a delivery truck in their city, (4) had seen an employee of DHL on a cargo bike in their city, and (5) had seen an employee of DHL on foot in their city. The critical item on this list was the cargo bike answer. Participants were also asked to rate on a 7-point scale
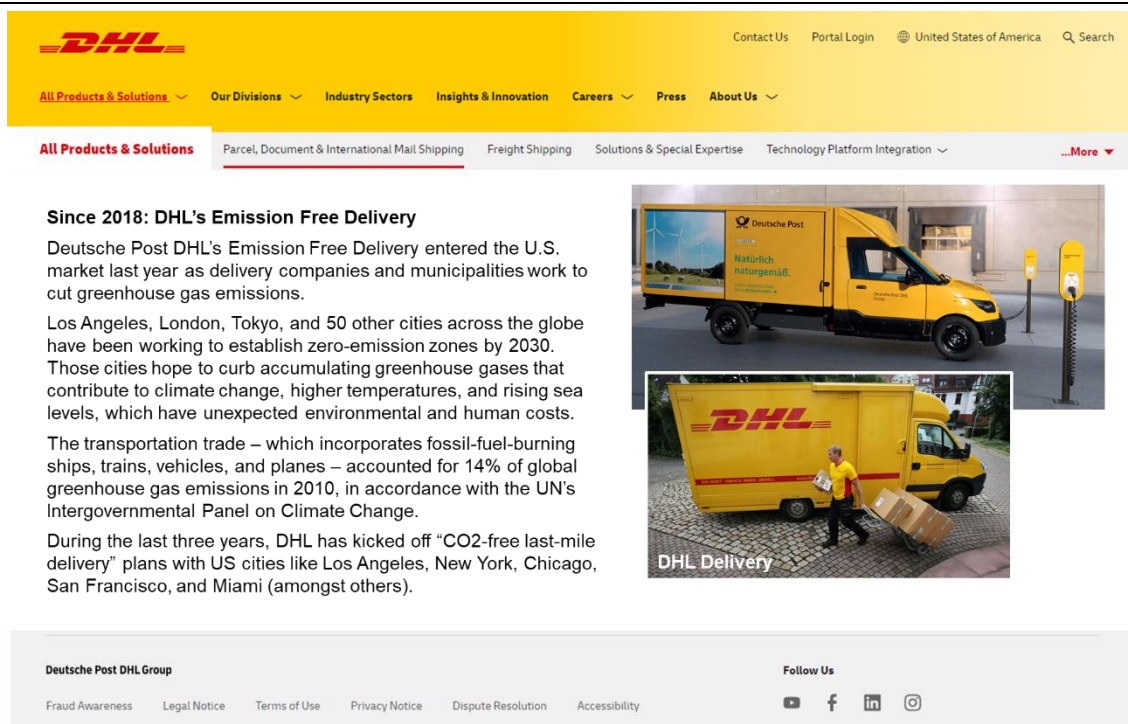
how confident they were for each of the memory questions. Finally, they answered questions that measured relevance of courier services and internet for courier services (no significant differences across the two conditions), and they completed demographic information.

*Results.* We find no differences for the indications whether they had received a delivery from DHL in the past ($M_{CARGO}$ =92%, $M_{No\_CARGO}$ = 89%; t(180) = .81, *ns*), had sent a delivery via DHL to someone in the past ($M_{CARGO}$ = 48%, $M_{No\_CARGO}$ = 40%; t(180) = 1.06, *ns*), had seen an employee of DHL with a delivery truck in their city ($M_{CARGO}$ = 89%, $M_{No\_CARGO}$ = 89%; t(180) =.05, *ns*), and had seen an employee of DHL on foot in their city ($M_{CARGO}$ = .84, $M_{No\_CARGO}$ = .79; t(180) = .83, *ns*). The critical item of whether customers had the experience of observing a DHL employee on a cargo bike in their city was indicated by 23% in the treatment condition and only by 9% in the control condition (t(180) = 2.60, *p* < .01). The false memory rate in the treatment condition is in line with the false memory rates in other studies (e.g., Braun, Ellis, and Loftus 2002, Braun-Latour et al. 2004, Braun-Latour, Grinley, and Loftus 2006; Wade et al. 2002). The confidence ratings for the memory of whether they have encountered an employee of DHL on a cargo bike in their city did not differ between conditions ($M_{CARGO}$ = 5.76, $M_{No\_CARGO}$ = 5.86; t(180) = .24, *ns*). This indicates that the introduction of false memories is not associated with a reduced confidence in the memory, in line with other studies on false memories (e.g., Rajagopal and Montgomery 2011).

To summarize, the pretest enabled further evidence for reconstructive memory processes and demonstrated that the digital presence of employees on a service website not only changes memories according to aspects that might be emphasized or hindered during retrieval, but that it also can create outright false memories.

## Web Appendix 3: Experimental Conditions from the Pretest

### A: Website without the Cargo Bike



### B: Website with the Cargo Bike

**Web Appendix 4. Sample of the Field Study**

| Industry | Number of Firms | Percentage |
|---|:---:|:---:|
| Communication services | 2 | 1.8% |
| Energy services | 17 | 15.0% |
| Financial services | 10 | 8.8% |
| Health insurance services | 12 | 10.6% |
| Insurance services | 12 | 10.6% |
| IT services | 4 | 3.5% |
| Medical services | 6 | 5.3% |
| Personnel recruitment services | 7 | 6.2% |
| Retail services | 19 | 16.8% |
| Transportation services | 13 | 11.5% |
| Other service industries | 11 | 9.7% |
| **Firm Size** | | |
| <200 Employees | 29 | 25.7% |
| 200–499 Employees | 20 | 17.7% |
| 500–999 Employees | 16 | 14.2% |
| 1,000–2,499 Employees | 22 | 19.5% |
| 2,500–4,999 Employees | 16 | 14.2% |
| 5,000–10,000 Employees | 5 | 4.4% |
| >10,000 Employees | 5 | 4.4% |
| **Self-Service Technology** | | |
| Only online self-service technology | 59 | 52.2% |
| Only offline self-service technology | 7 | 6.2% |
| Both online and offline self-service technology | 17 | 15.0% |
| No self-service technology | 30 | 26.5% |
| **Annual Revenue of the Firm** | | |
| <$25 million | 1 | 1.5% |
| $25 million–$49 million | 3 | 4.5% |
| $50 million–$99 million | 3 | 4.5% |
| $100 million–$199 million | 7 | 10.6% |
| $200 million–$499 million | 3 | 4.5% |
| $500 million–$999 million | 13 | 19.7% |
| $1,000 million–$2,000 million | 9 | 13.6% |
| >$2,000 million | 27 | 40.9% |

*Note*: Annual revenue data were available for 66 firms. Online self-service technology refers to self-service portals, examples of offline self-service technology include ATM, bank statement printer, price scanner, and self-checkout terminals.

## Web Appendix 5. Measurement and Sources of Key Variables in the Field Study

| | |
|---|---:|
| **Website Data ($t_1$)** | |
| ***Digital Presence of Service Employees*** (Cyr et al. 2009) | |
| Indicating whether a firm provides pictorial information of service employees on their website or not (0 = no, 1 = yes) | |
| ***Employee Accessibility*** | |
| Total number of contact options: chat, phone number, e-mail address, postal address (ranging from 0 to 4) | |
| **Management Data ($t_1$)** | |
| ***Customer Orientation*** (Homburg, Wieseke, and Hoyer 2009) | |
| CR = .86 / α = .86 / AVE = .56 (5-point scale: totally disagree/totally agree) | |
| Our service employees… | |
| ▪ try to figure out what a customer's needs are. | .85 |
| ▪ have the customer's best interests in mind. | .72 |
| ▪ take a problem solving approach in selling services to customers. | .76 |
| ▪ recommend services that are best suited to solving problems. | .70 |
| ▪ try to find out which kinds of services would be most helpful to customers. | .73 |
| **Customer Data ($t_2$)** | |
| ***Website Service Quality*** (Montoya-Weiss, Voss, and Grewal 2003) | |
| CR = .89 / α = .90 / AVE = .67 (11-point scale: totally disagree/totally agree) | |
| The service firm provides… | |
| ▪ a high level of overall service through its website. | .84 |
| ▪ convenient service through its website. | .85 |
| ▪ competent service through its website.* | .85 |
| ▪ helpful assistance through its website. | .82 |
| ***Employee Service Quality*** (De Jong, de Ruyter, and Lemmink 2004) | |
| CR = .95 / α = .94 / AVE = .70 (11-point scale: totally disagree/totally agree) | |
| Service employees of this firm… | |
| ▪ make clear appointments. | .86 |
| ▪ provide the promised information at a high speed. | .71 |
| ▪ are friendly and polite. | .83 |
| ▪ provide competent service.* | .87 |
| ▪ take their time to serve me. | .81 |
| ▪ pay attention to me. | .87 |
| ▪ show empathy. | .88 |
| ▪ are ready to help me. | .85 |
| ***Customer Loyalty*** (Homburg, Müller, and Klarmann 2011) | |
| CR = .88 / α = .85 / AVE = .56 | |
| (11-point scale: very low/very high) The likelihood of… | |
| ▪ considering this service firm as my first choice for the purchase of such services is… | .48 |
| ▪ staying loyal to this service firm is… | .90 |
| ▪ doing more business with this service firm in the future is… | .71 |
| ▪ additionally purchasing other services from this service firm in the future is… | .74 |
| ▪ recommending this service firm to other people is… | .81 |
| ▪ saying positive things about this service firm to other people is… | .76 |
| **Financial Performance Data ($t_3$)** | |
| Annual revenue in the financial period after the customer data collection. | |

Notes: Data collection in German. CR = composite reliability, α = Cronbach's alpha, AVE = average variance extracted.
*The two items are used for a robustness test; the original German items literally mirror each other in the questionnaire (i.e., "*Servicemitarbeiter dieser Firma bieten kompetenten Service*" versus "*Die Webseite dieser Firma bietet kompetenten Service*").

## Web Appendix 6. Multi-Dimensional Measurement of Service Quality

| Item | Study 1 ESQ | Study 1 WSQ | Study 2 ESQ | Study 2 WSQ | Study 3a ESQ | Study 3a WSQ | Study 3b ESQ | Study 3b WSQ | Study 4 ESQ | Study 4 WSQ | Study 5 ESQ | Study 5 WSQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Website Service Quality (WSQ)* | | | | | | | | | | | | |
| [The service firm] provides… | | | | | | | | | | | | |
| ▪ a high level of overall service through its website. | .152 | ***.893*** | .135 | ***.896*** | .292 | ***.905*** | .242 | ***.887*** | .182 | ***.788*** | .249 | ***.861*** |
| ▪ convenient service through its website. | .159 | ***.918*** | .268 | ***.815*** | .243 | ***.916*** | .171 | ***.906*** | .110 | ***.873*** | .306 | ***.834*** |
| ▪ competent service through its website. | .256 | ***.907*** | .185 | ***.879*** | .343 | ***.872*** | .175 | ***.893*** | .234 | ***.830*** | .172 | ***.885*** |
| ▪ helpful assistance through its website. | .207 | ***.899*** | .155 | ***.842*** | .317 | ***.885*** | .191 | ***.874*** | .241 | ***.844*** | .196 | ***.892*** |
| *Employee Service Quality (ESQ)* | | | | | | | | | | | | |
| The employee(s) of [the service firm]… | | | | | | | | | | | | |
| ▪ made clear appointments. | ***.904*** | .223 | – | – | – | – | – | – | – | – | – | – |
| ▪ provided the promised information at a high speed. | ***.901*** | .297 | – | – | – | – | – | – | – | – | – | – |
| ▪ were friendly and polite. | ***.910*** | .213 | ***.858*** | .184 | ***.874*** | .283 | ***.880*** | .218 | ***.743*** | .236 | ***.840*** | .201 |
| ▪ provided competent service. | ***.919*** | .245 | ***.846*** | .240 | ***.901*** | .256 | ***.888*** | .206 | ***.753*** | .299 | ***.833*** | .256 |
| ▪ took their time to serve me. | ***.937*** | .210 | ***.885*** | .180 | ***.851*** | .351 | ***.873*** | .203 | ***.883*** | .142 | ***.860*** | .235 |
| ▪ paid attention to me. | ***.873*** | .005 | ***.891*** | .230 | ***.894*** | .279 | ***.894*** | .199 | ***.838*** | .176 | ***.847*** | .188 |
| ▪ showed empathy | ***.906*** | .209 | ***.704*** | .094 | ***.865*** | .260 | ***.798*** | .111 | ***.803*** | .060 | ***.725*** | .194 |
| ▪ were ready to help me. | ***.906*** | .220 | ***.897*** | .181 | ***.880*** | .336 | ***.895*** | .220 | ***.835*** | .270 | ***.834*** | .218 |
| **Confirmatory Factor Analyses** | | | | | | | | | | | | |
| *Two-Dimensional Measurement* | | | | | | | | | | | | |
| Chi-square | 95.646 | | 104.764 | | 77.371 | | 83.458 | | 120.538 | | 102.851 | |
| Degrees of freedom | 53 | | 34 | | 34 | | 34 | | 34 | | 34 | |
| Comparative fit index | .976 | | .952 | | .987 | | .975 | | .909 | | .968 | |
| Tucker-Lewis index | .970 | | .937 | | .983 | | .967 | | .879 | | .957 | |
| Root mean square error | .084 | | .106 | | .068 | | .075 | | .133 | | .086 | |
| Standardized root mean square error | .040 | | .037 | | .024 | | .031 | | .056 | | .034 | |
| *One-Dimensional Measurement* | | | | | | | | | | | | |
| Chi-square | 463.738 | | 466.563 | | 949.406 | | 725.048 | | 343.345 | | 689.240 | |
| Degrees of freedom | 54 | | 35 | | 35 | | 35 | | 35 | | 35 | |
| Comparative fit index | .772 | | .707 | | .727 | | .653 | | .675 | | .691 | |
| Tucker-Lewis index | .722 | | .624 | | .649 | | .553 | | .582 | | .603 | |
| Root mean square error | .259 | | .258 | | .310 | | .278 | | .247 | | .260 | |
| Standardized root mean square error | .167 | | .159 | | .142 | | .172 | | .142 | | .143 | |
| *Chi-Square Difference Test* | *368.092\*\*\** | | *361.799\*\*\** | | *872.035\*\*\** | | *641.59\*\*\** | | *222.807\*\*\** | | *586.389\*\*\** | |

\*\*\**p* < .01, \*\**p* < .05, \**p* < .10.

**Web Appendix 7. Descriptives and Correlations of Key Variables in the Field Study**

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Digital Presence of Service Employees | | | | | | |
| 2. Customer Orientation | .030 | | | | | |
| 3. Employee Accessibility | .218 ** | -.072 | | | | |
| 4. Website Service Quality | .224 ** | .117 | .048 | | | |
| 5. Employee Service Quality | .271 *** | .251 *** | .144 | .372 *** | | |
| 6. Customer Loyalty | .118 | .148 | .131 | .363 *** | .731 *** | |
| **Mean** | .460 | 4.617 | .650 | 7.857 | 8.460 | 7.687 |
| **SD** | .501 | .452 | .935 | 1.678 | 1.608 | 1.958 |

***$p < .01$, **$p < .05$, *$p < .10$.

Notes: All correlations are based on scores aggregated to the firm level (n = 113). The overall fit indices for the multilevel confirmatory factor analyses with robust standard errors are as follows: manager data: $\chi^2$(df) = 8.51 (5), $p < .01$, confirmatory fit index (CFI) = .98, root mean square error of approximation (RMSEA) = .01; customer data: $\chi^2$(df) = 354.66 (132), $p < .01$, CFI = .99, RMSEA = .02.

**Web Appendix 8. Estimates for the First-Stage Probit Model in the Field Study**

| | Digital Presence of Service Employees (No [0] vs. Yes [1]) | |
|---|---|---|
| | Parameter Estimates | Standard Errors |
| Customer orientation | .490 | (.330) |
| Employee accessibility | .348 | (.158)** |
| Service customization | -.212 | (.167) |
| Media richness of the website | -.356 | (.278) |
| Responsive website design | -.460 | (.318) |
| Website structure | -.159 | (.154) |
| Offering an app | .221 | (.324) |
| Brand orientation | .053 | (.136) |
| Number of service channels | .068 | (.101) |
| Employee-to-customer ratio | 2.409 | (1.372)* |
| B2B vs. B2C focus | .360 | (.463) |
| Use of self-service technologies | -.353 | (.342) |
| | | |
| Firm size | .207 | (.091)** |
| | | |
| Pseudo $R^2$ | .216 | |
| Wald χ2 | 20.29 (13), $p = .09$ | |

***$p < .01$, **$p < .05$, *$p < .10$.

Notes: Significance is based on two-tailed tests.
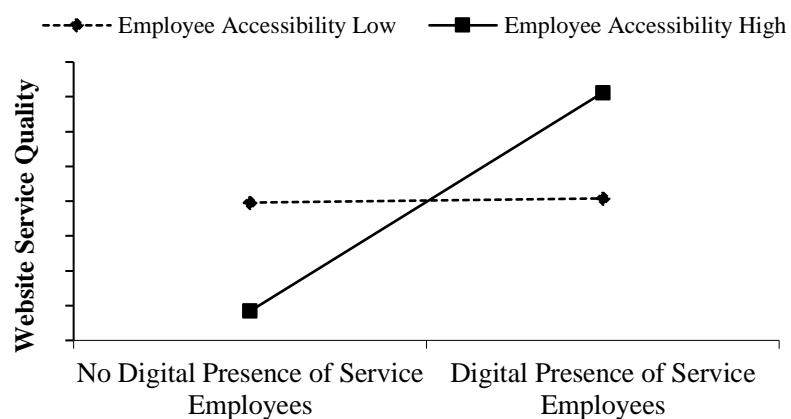
## Web Appendix 9. Control Variables in the Field Study

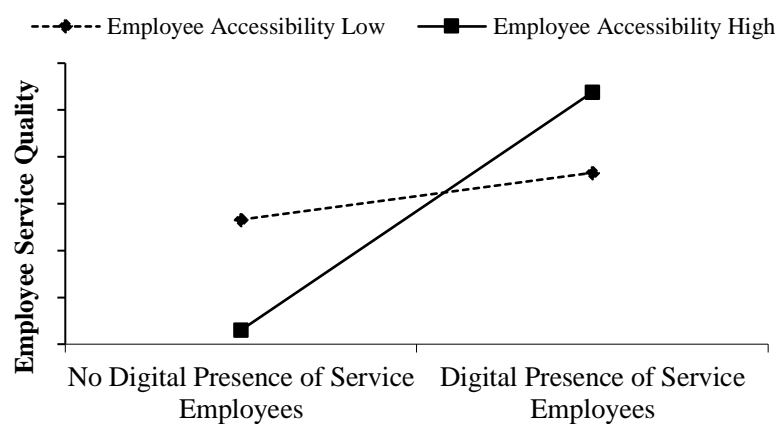| | Model 1: Main Effects | | Model 2: Interactions | |
|---|---|---|---|---|
| | $\gamma$ | (se) | $\gamma$ | (se) |
| **DV: Website Service Quality** | | | | |
| *Controls* | | | | |
| Mobile functionality of the website | .030 | (.026) | .026 | (.027) |
| Mobile app | .074 | (.032)** | .083 | (.032)*** |
| Employees per customer ratio | -.033 | (.022) | -.036 | (.023) |
| Length of relationship | -.040 | (.017)** | -.038 | (.017)** |
| Frequency of exchange | -.017 | (.021) | -.020 | (.021) |
| Touchpoint usage | .016 | (.017) | .017 | (.017) |
| Gender | .020 | (.015) | .019 | (.016) |
| Age | .055 | (.021)*** | .049 | (.022)** |
| **DV: Employee Service Quality** | | | | |
| *Controls* | | | | |
| Mobile functionality of the website | -.009 | (.023) | -.016 | (.022) |
| Mobile app | .016 | (.023) | .026 | (.022) |
| Employees per customer ratio | .031 | (.016)* | .023 | (.013)* |
| Length of relationship | .001 | (.021) | .002 | (.020) |
| Frequency of exchange | .022 | (.016) | .019 | (.016) |
| Touchpoint usage | .030 | (.011)*** | .030 | (.011)*** |
| Gender | -.022 | (.013)* | -.023 | (.013)* |
| Age | .004 | (.016) | .000 | (.015) |
| **DV: Customer Loyalty** | | | | |
| *Controls* | | | | |
| Mobile functionality of the website | .023 | (.019) | .019 | (.020) |
| Mobile app | -.012 | (.024) | -.007 | (.025) |
| Employees per customer ratio | -.006 | (.019) | -.008 | (.019) |
| Length of relationship | .025 | (.019) | .025 | (.019) |
| Frequency of exchange | .021 | (.017) | .021 | (.017) |
| Touchpoint usage | .010 | (.011) | .009 | (.011) |
| Gender | .002 | (.012) | .001 | (.012) |
| Age | -.012 | (.015) | -.012 | (.016) |
| | | | | |
| $R^2$ Website service quality | .330 | | .379 | |
| $R^2$ Employee service quality | .428 | | .494 | |
| $R^2$ Customer loyalty | .618 | | .623 | |

***$p < .01$, **$p < .05$, *$p < .10$.

Notes: Significance is based on two-tailed tests, standardized results. Fixed industry effects are included.

## Web Appendix 10. Moderating Effects in the Field Study

**A: Moderating Effect of Employee Accessibility on Website Service Quality**

- - ◆ - - Employee Accessibility Low     ━■━ Employee Accessibility High

Website Service Quality

No Digital Presence of Service Employees     Digital Presence of Service Employees

**B: Moderating Effect of Employee Accessibility on Employee Service Quality**

- - ◆ - - Employee Accessibility Low     ━■━ Employee Accessibility High

Employee Service Quality

No Digital Presence of Service Employees     Digital Presence of Service Employees

**C: Moderating Effect of Customer Orientation on Employee Service Quality**

- - ◆ - - Customer Orientation Low     ━■━ Customer Orientation High

Employee Service Quality

No Digital Presence of Service Employees     Digital Presence of Service Employees
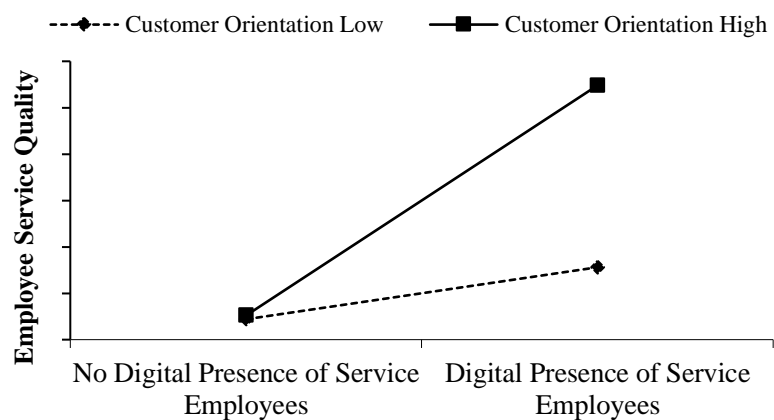
Notes: Estimates refer to low and high levels of the moderators (±1SD).

## Web Appendix 11. Results with Alternative Measures in the Field Study

| | Model 1: Main Effects | | Model 2: Interactions | | Hypotheses |
|---|---|---|---|---|---|
| | γ | (se) | γ | (se) | |
| **DV: Website Service Quality** | | | | | |
| *Main Effects* | | | | | |
| Digital presence of service employees (DPE) | .065 | (.032)** | .071 | (.032)** | $H_1$: supported |
| Employee accessibility (LIV-corrected) | .003 | (.030) | -.009 | (.032) | |
| Customer orientation (LIV-corrected) | .021 | (.030) | .021 | (.031) | |
| Employee accessibility (error term) | .001 | (.032) | .005 | (.032) | |
| Customer orientation (error term) | -.003 | (.026) | .000 | (.026) | |
| *Interactions* | | | | | |
| DPE × Employee accessibility | | | .044 | (.033) | $H_{3a}$: not supported |
| DPE × Customer orientation | | | .015 | (.028) | $H_{4a}$: not supported |
| *Support Points* | | | | | |
| Class 1 | -1.129 | (.067)*** | -1.129 | (.067)*** | |
| Class 2 | .184 | (.025)*** | .168 | (.026)*** | |
| IMR | .071 | (.036)** | .069 | (.034)** | |
| **DV: Employee Service Quality** | | | | | |
| *Main Effects* | | | | | |
| Digital presence of service employees (DPE) | .077 | (.022)*** | .086 | (.020)*** | $H_2$: supported |
| Employee accessibility (LIV-corrected) | -.024 | (.034) | -.043 | (.031) | |
| Customer orientation (LIV-corrected) | .039 | (.025) | .039 | (.022)* | |
| Employee accessibility (error term) | .074 | (.019)*** | .080 | (.016)*** | |
| Customer orientation (error term) | .028 | (.021) | .036 | (.019)* | |
| *Interactions* | | | | | |
| DPE × Employee accessibility | | | .066 | (.021)*** | $H_{3b}$: supported |
| DPE × Customer orientation | | | .039 | (.021)* | $H_{4b}$: supported |
| *Support Points* | | | | | |
| Class 1 | -1.623 | (.064)*** | -1.623 | (.064)*** | |
| Class 2 | .276 | (.024)*** | .249 | (.022)*** | |
| IMR | .012 | (.034) | .008 | (.034) | |
| **DV: Customer Loyalty** | | | | | |
| *Mediating Effects* | | | | | |
| Website service quality | .134 | (.016)*** | .134 | (.016)*** | |
| Employee service quality | .246 | (.019)*** | .246 | (.019)*** | |
| *Main Effects* | | | | | |
| Digital presence of service employees (DPE) | .016 | (.023) | .015 | (.021) | |
| Employee accessibility (LIV-corrected) | .001 | (.026) | .000 | (.028) | |
| Customer orientation (LIV-corrected) | .021 | (.021) | .019 | (.023) | |
| Employee accessibility (error term) | .034 | (.022) | .034 | (.021) | |
| Customer orientation (error term) | .006 | (.021) | .008 | (.022) | |
| *Interactions* | | | | | |
| DPE × Employee accessibility | | | -.001 | (.028) | |
| DPE × Customer orientation | | | .022 | (.024) | |
| *Support Points* | | | | | |
| Class 1 | -1.261 | (.059)*** | -1.262 | (.059)*** | |
| Class 2 | .302 | (.023)*** | .300 | (.024)*** | |
| IMR | -.075 | (.028)*** | -.074 | (.029)** | |
| $R^2$ Website service quality | .293 | | .308 | | |
| $R^2$ Employee service quality | .390 | | .475 | | |
| $R^2$ Customer loyalty | .590 | | .595 | | |

***$p < .01$, **$p < .05$, *$p < .10$.

Notes: We used the same single item related to the competence of the service offered online and offline to measure website and employee service quality in this robustness test. Significance is based on two-tailed tests, standardized results. Fixed industry effects for industry; the coefficients and standard errors for all controls are reported in Web Appendix 12.

## Web Appendix 12. Control Variables with Alternative Measures in the Field Study

| | Model 1: Main Effects | | Model 2: Interactions | |
|---|---|---|---|---|
| | $\gamma$ | (se) | $\gamma$ | (se) |
| *DV: Website Service Quality* | | | | |
| Controls | | | | |
| Mobile functionality of the website | .043 | (.026)* | .040 | (.027) |
| Mobile app | .055 | (.031)* | .061 | (.032)* |
| Employees per customer ratio | -.036 | (.019)* | -.037 | (.020)* |
| Length of relationship | -.022 | (.018) | -.021 | (.018) |
| Frequency of exchange | -.020 | (.023) | -.022 | (.022) |
| Touchpoint usage | .025 | (.015) | .026 | (.016)* |
| Gender | .014 | (.016) | .013 | (.016) |
| Age | .049 | (.020)** | .044 | (.020)** |
| *DV: Employee Service Quality* | | | | |
| Controls | | | | |
| Mobile functionality of the website | -.020 | (.022) | -.027 | (.021) |
| Mobile app | .039 | (.022)* | .050 | (.022)** |
| Employees per customer ratio | .027 | (.013)** | .023 | (.015) |
| Length of relationship | .012 | (.017) | .013 | (.017) |
| Frequency of exchange | .029 | (.017)* | .026 | (.016) |
| Touchpoint usage | .009 | (.014) | .011 | (.013) |
| Gender | -.006 | (.011) | -.007 | (.011) |
| Age | .005 | (.019) | -.002 | (.019) |
| *DV: Customer Loyalty* | | | | |
| Controls | | | | |
| Mobile functionality of the website | .019 | (.019) | .013 | (.020) |
| Mobile app | -.011 | (.023) | -.006 | (.025) |
| Employees per customer ratio | -.002 | (.018) | -.003 | (.019) |
| Length of relationship | .021 | (.018) | .020 | (.018) |
| Frequency of exchange | .022 | (.017) | .022 | (.017) |
| Touchpoint usage | .013 | (.010) | .013 | (.010) |
| Gender | -.002 | (.011) | -.002 | (.011) |
| Age | -.011 | (.016) | -.010 | (.016) |
| | | | | |
| $R^2$ Website service quality | .293 | | .308 | |
| $R^2$ Employee service quality | .390 | | .475 | |
| $R^2$ Customer loyalty | .590 | | .595 | |

***$p < .01$, **$p < .05$, *$p < .10$.
Notes: We used the same single item related to the competence of the service offered online and offline to measure website and employee service quality in this robustness test Significance is based on two-tailed tests, standardized results. Significance is based on two-tailed tests, standardized results. Fixed industry effects are included.

## Web Appendix 13. Results for Annual Revenues per Employee in the Field Study

| | Annual Revenues per Employee | | | |
| --- | --- | --- | --- | --- |
| | Model 1: Study Sample | | Model 2: All Customers | |
| | Parameter estimates | t-Value | Parameter estimates | t-Value |
| Industry Affiliation | | | | |
| Energy services | .205 | (1.194) | .216 | (1.258) |
| Financial services | -.170 | (1.070) | -.113 | (.732) |
| Medical services | -.134 | (.978) | -.119 | (.883) |
| Retail services | -.085 | (.509) | -.130 | (.770) |
| IT services | -.085 | (.623) | -.101 | (.739) |
| Communication services | -.063 | (.483) | -.055 | (.418) |
| Health insurance services | -.185 | (1.080) | -.262 | (1.441) |
| Transportation services | -.118 | (.781) | -.144 | (.948) |
| Personnel recruitment services | -.019 | (.141) | -.012 | (.085) |
| Insurance services | -.110 | (.801) | -.083 | (.609) |
| Customer loyalty (mean per firm) | .310 | (2.121)** | .342 | (2.194)** |
| $R^2$ | .158 | | .153 | |

***$p < .01$, **$p < .05$, *$p < .10$.

Notes: N = 66 firms. Significance is based on two-tailed tests, standardized results. Other service industries are the baseline category for industry affiliation.

## Web Appendix 14. Website Stimuli used in Study 2

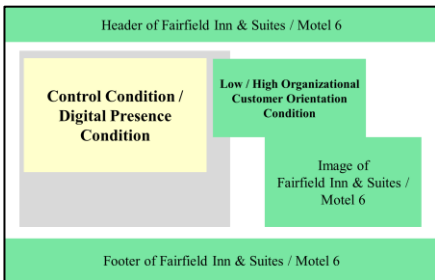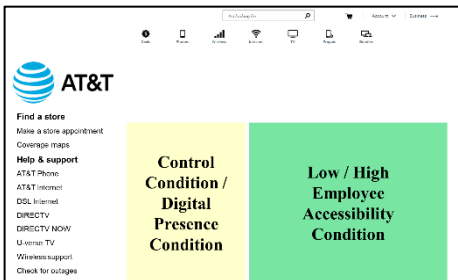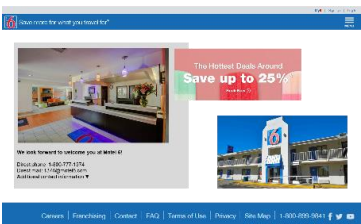**Website Design: Master for Control and DPE Conditions**
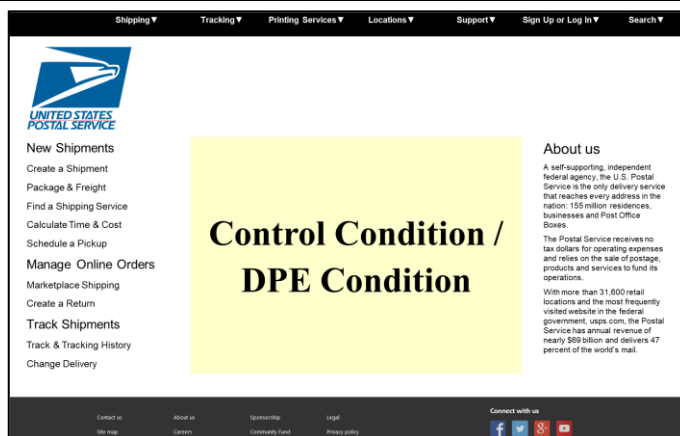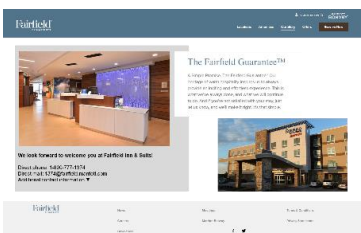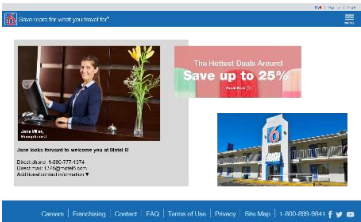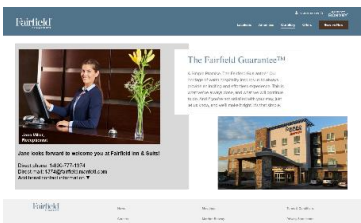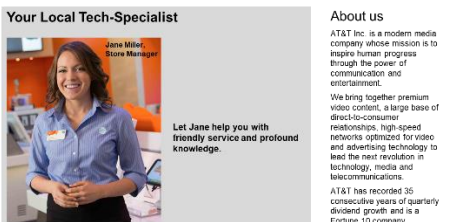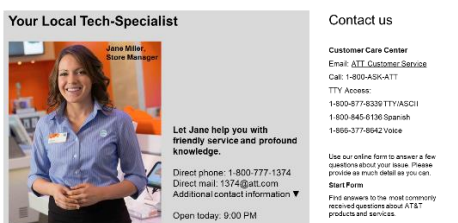


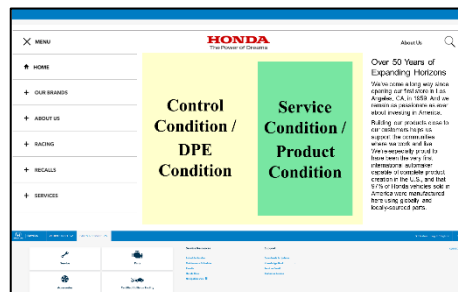**Control Condition**
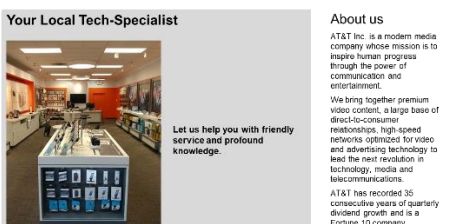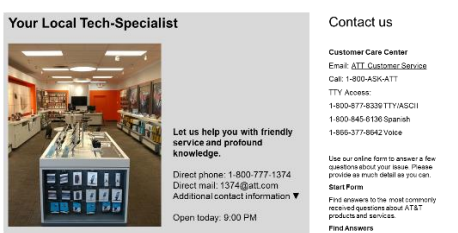


**Digital Presence Condition**
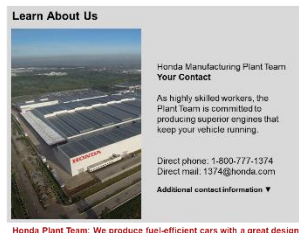


Note: The attributes "reliable", "friendly", and "on time" are included in both versions of the website.

## Web Appendix 15. Experimental Material for the Website Instructions

| | Study 3a | Study 3b |
|---|---|---|
| **Sampling** | Participants stayed both at Fairfield Inn & Suites AND Motel 6 | Participants have previous experience with AT&T |
| **Focal firm** | Fairfield Inn & Suites (high customer orientation) / Motel 6 (low customer orientation) | AT&T |
| **Instruction** | "Please provide us your opinion about the new website of *Fairfield Inn & Suites / Motel 6*" | "Please provide us your opinion about the new website of AT&T" |
| **Website design** |  |  |
| | **Two factorial 2-level design** | **Two factorial 2-level design** |



Note: CO = Customer Orientation; EA = Employee Accessibility.

|  | Study 4 | Study 5 |
|---|---|---|
| **Sampling** | Participants have previous experience with FedEx | Participants own a Honda and have previous experience with a Honda Service Advisor |
| **Focal firm** | FedEx | Honda |
| **Instruction** | "Please provide us your opinion about the FedEx website" | "Please provide us your opinion about the Honda website" |
| **Website design** |  |  |

| | | | **Nested 3-level design** | | **Two factorial 2-level design** |
|---|---|---|---|---|---|



Note: The attributes "reliable", "friendly", and "on time" are included in all versions of the website in Study 4.

## Web Appendix 16. Experimental Material for the Service Employee Encounter

| | Study 2 | Study 3a | Study 3b |
|---|---|---|---|
| | Courier Service | Hospitality Service | Telecommunication Service |
| **Framing** | Courier Service | Hospitality Service | Telecommunication Service |
| **Separation from website** | Pseudo-relevant description about the service context | Pseudo-relevant description about the service context | Pseudo-relevant description about the service context |
| **Text of the Filler Task / Scenario (for Study 2B)** | *Filler Task:*<br><br>In 2018, the Global Courier Services Market size was 299,100 million US$ and it is expected to reach 464,300 million US$ by the end of 2025. The North America ranks highest in courier service revenue at $101.87 billion, generating 34% of the total revenue in global.<br><br>Rising investments from established players. One of the growth drivers of the courier and local delivery services market in the US is the rising investments from established players. The rising demand from the e-commerce and retail sectors for efficient delivery services is encouraging players to invest in the US.<br><br>Increasing adoption of in-house delivery units by retailers. One of the challenges in the growth of the courier and local delivery services market in the US is the increasing adoption of in-house delivery units by retailers. In-house delivery networks are expected to restrict outsourced delivery service providers, which comprise courier and local delivery service providers, from availing growth opportunities in the retail segment in the US. | *Filler Task:*<br><br>2019 marks a decade since the US travel industry emerged from the depths of economic recession. And what a decade it's been. Over the past 10 years, the surge of recovery collided with an economic turning point in global emerging markets, fueling a historic burst in travel demand felt by segments across the travel industry.<br><br>But growth wasn't limited to traditional players. It's also been a remarkable decade for travel tech. Digital innovation helped form a lattice for entirely new segments to not only enter the market—but thrive. Some private accommodation and ride-hailing brands just finding their legs in 2009 already sit side by side with the titans of travel.<br><br>It's easy to lose perspective on just how much technology has shaped the travel and hospitality industry in such a relatively short time. In 2009, the first hotel and airline apps were just hitting the market. Instagram and iPads didn't exist. Most travelers scoured newspapers and magazines for vacation rentals. Overall, it's important for hoteliers to plan for the long term. | *Filler Task:*<br><br>5G is the 5th generation of mobile networks, a significant evolution of today's 4G LTE networks. 5G is being designed to meet the very large growth in data and connectivity of today's modern society, the internet of things with billions of connected devices, and tomorrow's innovations.<br><br>5G will initially operate in conjunction with existing 4G networks before evolving to fully standalone networks in subsequent releases and coverage expansions.<br><br>5G uses radio waves or radio frequency energy to transmit and receive voice and data connecting our communities. In addition to delivering faster connections and greater capacity, a very important advantage of 5G is the fast response time referred to as latency.<br>Latency is the time taken for devices to respond to each other over the wireless network. 3G networks had a typical response time of 100 milliseconds, 4G is around 30 milliseconds, and 5G will be as low as 1 millisecond. This is virtually instantaneous opening up a new world of connected applications. |
| **Instruction** | Participants were asked to think about the last time when they met an employee from USPS and indicate their "opinion about the employee from USPS" | Participants were asked to think about the last time when they met an employee from *Fairfield Inn & Suites / Motel 6* and indicate their "opinion about the employee from *Fairfield Inn & Suites / Motel 6*" | Participants were asked to think about the last time when they met an employee from AT&T and indicate their "opinion about the employee from AT&T" |
| **Reconstructive memory assessment** | Please pick three words that best describe the behavior of the employee from USPS for you:<br>□ Polite □ Friendly □ Competent<br>□ On time □ Capable □ Punctual<br>□ Reliable | n.a. | n.a. |

| | Study 4 | Study 5 |
|---|---|---|
| **Framing** | Courier Service | Product/Car and Service |
| **Separation from website** | Pseudo-relevant description about the service context | Pseudo-relevant description about the U.S. Numbered Highway System |
| **Text of the Filler Task / Scenario (for Study 2B)** | *Filler Task:*<br><br>In 2018, the Global Courier Services Market size was 299,100 million US$ and it is expected to reach 464,300 million US$ by the end of 2025. The North America ranks highest in courier service revenue at $101.87 billion, generating 34% of the total revenue in global.<br>　Rising investments from established players. One of the growth drivers of the courier and local delivery services market in the US is the rising investments from established players. The rising demand from the e-commerce and retail sectors for efficient delivery services is encouraging players to invest in the US. Increasing adoption of in-house delivery units by retailers. One of the challenges in the growth of the courier and local delivery services market in the US is the increasing adoption of in-house delivery units by retailers. In-house delivery networks are expected to restrict outsourced delivery service providers, which comprise courier and local delivery service providers, from availing growth opportunities in the retail segment in the US. | *Filler Task:*<br><br>There are approximately 4 million miles of public roads in the United States and 8.3 million lane miles. The majority (76% of lane miles) of paved public roads in the United States are two-lane rural highways, and the remainder are urban and rural multilane roads.<br>　The United States Numbered Highway System is an integrated network of roads and highways numbered within a nationwide grid in the contiguous United States. As the designation and numbering of these highways were coordinated among the states, they are sometimes called Federal Highways, but the roadways were built and have always been maintained by state or local governments.<br>Expansion of the U.S. Highway System continued until 1956, when the Interstate Highway System was laid out and began construction. After construction was completed, many U.S. Routes were replaced by Interstate Highways for through traffic. Despite the Interstate System, U.S. Highways still form many important regional connections, and new routes are still being added. |
| **Instruction** | Participants were asked to think about the last time when they met an employee from FedEx and indicate their "opinion about the employee from FedEx" | Participants were asked to think about the last time when they interacted with a Service Advisor from Honda and to provide their opinion about their car from Honda. |
| **Reconstructive memory assessment** | Please pick three words that best describe the behavior of the employee from FedEx for you:<br>□ Polite □ Friendly □ Competent<br>□ On time □ Capable □ Punctual<br>□ Reliable | Please pick three words that best describe the behavior of the Service Advisor from Honda for you:<br>□ Polite □ Friendly □ Competent<br>□ On time □ Capable □ Punctual<br>□ Reliable<br><br>Please pick three words that best describe your Honda car for you:<br>□ Fuel-Efficient □ Powerful □ Great Design □ Value for Money □ Prestigious □ Modern □ Great Engineering |

## Web Appendix 17. Measurement in the Experimental Studies

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***Website Service Quality*** (Montoya-Weiss, Voss, and Grewal 2003)
$\alpha_{Study2}$ = .90, $\alpha_{Study3a}$ = .96, $\alpha_{Study3b}$ = .93, $\alpha_{Study4}$ = .89, $\alpha_{Study5}$ = .92
(7-point scale: totally disagree/totally agree)
[The service firm] provides…
- a high level of overall service through its website.
- convenient service through its website.
- reliable service through its website.
- helpful assistance through its website.

***Employee Service Quality*** (De Jong, de Ruyter, and Lemmink 2004)
$\alpha_{Study2}$ = .93, $\alpha_{Study3a}$ = .97, $\alpha_{Study3b}$ = .95, $\alpha_{Study4}$ = .91, $\alpha_{Study5}$ = .92
(7-point scale: totally disagree/totally agree)
The employee of [the service firm]…
- was friendly and polite.
- provided competent service.
- took time to serve me.
- paid attention to me.
- showed empathy.
- was ready to help me.

***Product Quality*** (Stone-Romero, Stone, Grewal 1997)
$\alpha_{Study5}$ = .80
(7-point scale: totally disagree/totally agree)
My car from [firm]…
- is flawless.
- is distinctive.
- has a nice appearance.
- is durable.

***Customer Loyalty*** (Homburg, Müller, and Klarmann 2011)
$\alpha_{Study2}$ = .91
(7-point scale: very low/very high)
The likelihood of…
- considering [the service firm] as my first choice for the purchase of such services is…
- staying loyal to [the service firm] is…
- doing more business with [the service firm] in the future is…
- additionally purchasing other services from [the service firm] in the future is…
- recommending [the service firm] to other people is…
- saying positive things about [the service firm] to other people is…

***Social Presence*** (Bleier, Harmeling, and Palmatier 2019)
$\alpha_{Study2}$ = .96
(7-point scale: totally disagree/totally agree)
- There is a sense of human contact in the website.
- There is a sense of human warmth in the website.
- There is a sense of human sensitivity in the website.

***Perceived Enjoyment*** (Hassanein and Head 2006)
$\alpha_{Study2}$ = .92
(7-point scale: totally disagree/totally agree)
- I find the website interesting.
- I find the website entertaining.
- I find the website enjoyable.
- I find the website pleasant.

***Memory Vividness*** (Luchetti and Sutin 2016)
$\alpha_{Study2}$ = .94
(7-point scale: totally disagree/totally agree)
- My memory of the last encounter with a service employee is very vivid.
- My memory for the last encounter with a service employee is very detailed.
- My memory for the last encounter with a service employee is very clear.

***Image Appeal*** (Cyr et al. 2009)

$\alpha_{Study2} = .88$

(7-point scale: totally disagree/totally agree)

- The images used in the website are appropriate.
- The images used in the website are satisfying.
- The images used in the website are exciting.
- The images used in the website are interesting.
- The images used in the website are appealing.

***Overall Website Service*** (Fornell et al. 1996; Hult et al. 2019)

Using a ten point scale, on which "1" means "not very high" and "10" means "very high," how would you rate the overall service quality of the website?

***Overall Employee Service Quality*** (Fornell et al. 1996; Hult et al. 2019)

Using a ten point scale, on which "1" means "not very high" and "10" means "very high", how would you rate the overall service quality of the employee?

***Overall Product Quality*** (Fornell et al. 1996; Hult et al. 2019)

Using a ten point scale, on which "1" means "not very high" and "10" means "very high", how would you rate the overall product quality of your car?

## Web Appendix 18. Detailed Results of Study 2

| | Social Presence Perceptions | | Image Appeal | | Website Enjoyment | | Memory Vividness | | Website Service Quality | | Employee Service Quality | | Customer Loyalty | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | b | t-Value | b | t-Value | b | t-Value | b | t-Value | b | t-Value | b | t-Value | b | t-Value |
| Last website visit | .127* | (1.996) | .066 | (1.066) | .043 | (.965) | -.040 | (.562) | -.014 | (.195) | -.068 | (1.039) | -.055 | (1.053) |
| Last service employee encounter | -.036 | (.619) | -.060 | (.776) | .017 | (.333) | -.255*** | (3.929) | -.001 | (.031) | -.003 | (.042) | -.076 | (1.198) |
| Digital presence of service employee | .501*** | (7.896) | .231*** | (3.259) | -.082 | (1.444) | -.010 | (.151) | .088 | (1.521) | .082 | (1.210) | .010 | (.163) |
| Social presence perceptions | | | | | .527*** | (5.211) | .411*** | (4.011) | -.048 | (.392) | -.103 | (1.101) | -.061 | (.709) |
| Image appeal | | | | | .314*** | (2.820) | -.075 | (.852) | .085 | (1.053) | .057 | (.556) | .123 | (1.414) |
| Website enjoyment | | | | | | | | | .532*** | (4.768) | .174 | (1.538) | .097 | (1.078) |
| Memory vividness | | | | | | | | | .149* | (1.819) | .443*** | (5.001) | -.045 | (.668) |
| Website service quality | | | | | | | | | | | | | .399*** | (5.103) |
| Employee service quality | | | | | | | | | | | | | .346*** | (4.224) |
| $R^2$ | .273 | | .060 | | .429 | | .221 | | .366 | | .250 | | .491 | |

***$p < .01$, **$p < .05$, *$p < .10$.
Notes: N = 185. Significance is based on two-tailed tests, standardized results.

**Web Appendix 19. Study 3b on the Moderating Role of Employee Accessibility**

*Design, procedure, and measures.* We used a 2 (digital presence manipulation) × 2 (employee accessibility: low vs. high) between-subjects design and AT&T as the focal service company (see Web Appendix 15 and 16). A pretest of this design with 40 participants confirmed that the versions of the websites with more contact options evoked higher employee accessibility ratings (7-point scale, $M_{High} = 6.20$, $M_{Low} = 4.10$; $F(1, 38) = 15.37$, $p < .01$). The main study participants were 300 U.S. consumers (MTurk, $M_{age} = 37.5$ years, 51% women, the IMC excluded 27 participants). After viewing one of four versions of a fictitious version of AT&T's website and rating website service quality, participants read pseudo-relevant information about 5G technology as a filler task, then evaluated the service quality associated with their last encounter with an employee. We excluded 11 participants who spent too much time on the questionnaire (+2SD) and 17 participants who never encountered an employee of AT&T.

*Results.* With 2 × 2 multivariate analyses of variance, we find significant main effects of the digital presence of service employees on website service quality ($F(1, 268) = 26.67$, $p < .01$) and employee service quality ($F(1, 268) = 10.82$, $p < .01$) as well as employee accessibility on website service quality ($F(1, 268) = 13.47$, $p < .01$) and employee service quality ($F(1, 268) = 9.99$, $p < .01$). Moreover, the interaction effect is marginally significant for website service quality ($F(1, 268) = 2.84$, $p < .10$) and significant for employee service quality ($F(1, 268) = 4.04$, $p < .05$).[1] For the high employee accessibility condition, the digital presence of service employees leads to higher website service quality ($M_{DPE} = 5.88$, $M_{No\_DPE} = 4.79$; $t(133) = 5.16$, $p < .01$) and employee service quality ($M_{DPE} = 5.82$, $M_{No\_DPE} = 4.83$; $t(133) = 3.82$, $p < .01$). For the low employee accessibility condition, we find no significant effect of the digital presence of

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[1] Using overall website and employee service quality produces similar results.

service employees on employee service quality ($M_{DPE} = 4.85$, $M_{No\_DPE} = 4.62$; $t(133) = .87$, $p = .39$) and the effect on website service quality is comparably smaller than in the high employee accessibility condition ($M_{DPE} = 5.02$, $M_{No\_DPE} = 4.77$; $t(133) = 2.29$, $p < .05$). Thus, Study 3a reveals similar findings as the field study such that the digital presence effects on website and employee service quality depend on employee accessibility.

**Web Appendix 20. Study 5 on Digital Presence Effects in the Product Context**

*Design, procedure, and measures.* We use the American Honda Motor Company as the focal company to test whether the spillover effects of the digital presence are specific for the service domain or generalize to the product domain. Honda primarily manufactures cars but also provides various services in personal contact with Honda Service Advisors and on their website (Honda 2019). Moreover, customers interact with Honda Service Advisors but they typically do not encounter any manufacturing employees that assemble their car. We manipulate the digital presence of a service employee or a manufacturing employee using image editing technology which sets the identical person in the service context (with the typical blue dress of Honda Service Advisors in a service environment) or in the product context (with the typical white dress of Honda manufacturing employees in a car plant environment). We pretested these images among 30 Honda owners: All participants correctly identified the picture of the employee in the blue dress as displaying a service employee and the picture of the employee in the white dress as displaying a manufacturing employee. Importantly, the digital presence spillover effect for service employees concerns perceptions of employee service quality whereas the effect of the digital presence of manufacturing employees would be expected to spill over to perceptions of product quality. As two separate dependent variables measure the spillover effect for the two types of employees, we analyze their effects separately instead of testing an interaction effect model. Hence, we use a randomized between-subjects design with a single treatment factor (digital presence of employees: yes vs. no) in the service or product context.

Participants were 277 U.S. consumers (MTurk, $M_{age}$ = 35.0 years, 38% women; the IMC excluded 45 participants, two participants did not remember their last service encounter, and 23 participants took too much time at +2SD). We required that all participants own a Honda, had

some contact with a Service Advisor from Honda, and have not experienced a severe service

failure from Honda. Sixty-one percent of participants owned a new car, average age of the car is

6 years, and the most frequent models were Accord (35%), Civic (24%), and CR-V (14%).

Participants were randomly assigned to the service vs. product context and to a website

with or without the digital presence of an employee (see Web Appendix 15). Both the website

with and without the digital presence contained the same three describing attributes that

described either the service quality or the product quality. After viewing the assigned website

and rating website service quality, participants read pseudo-relevant information about the U.S.

Numbered Highway System (see Web Appendix 16). In the service condition, participants were

asked to think about their last service experience (i.e., the last time when they met a Honda

Service Advisor). As consumers do not have direct contact with manufacturing employees, they

were asked to think about their product experience in the product condition. All consumers rated

website service quality, and depending on the condition, either employee service quality or

product quality as dependent variables. After that, they either described the service employee's

behavior by choosing out of seven listed service characteristics (service context condition) or

their car by choosing out of seven listed product characteristics (product context condition).

Three out of the seven characteristics were the attributes that appeared both on the website with

and without the digital presence. Finally, they rated the perceived quality related to the domain

that was not the focus of their condition.

In addition to the same measures as in our other studies, we captured product quality with a

scale based on Stone-Romero, Stone, and Grewal (1997), and with an overall product quality

measure that mirrors the overall website service quality measure and the overall employee

service quality measure (Web Appendix 17). All items of the respective dimensions of service

quality loaded on their respective dimension. Moderate correlations ranging from .41 to .51 suggest that participants differentiate between the three measures in their assessment of Honda.

*Results.* Regarding website service quality, we find that both the digital presence of a service employee ($M_{DPE}$ = 5.82, $M_{No\_DPE}$ = 5.39; $t(140)$ = 2.57, $p < .05$) and the digital presence of a manufacturing employee ($M_{DPE}$ = 5.72, $M_{No\_DPE}$ = 5.41; $t(133)$ = 1.76, $p < .10$) have significant positive effects. For the spillover effect to employee service quality, we find a positive effect of the digital presence of service employees ($M_{DPE}$ = 6.19, $M_{No\_DPE}$ = 5.88; $t(140)$ = 2.10, $p < .05$). In line with the reconstructive memory process, respondents exposed to the digital presence of service employees tend to choose more descriptive words from the website when describing the service characteristics of their encounter with a Honda Service Advisor than respondents not exposed to the digital presence ($M_{DPE}$ = 1.70, $M_{no\_DPE}$ = 1.43; $t(140)$ = 1.84, $p < .10$). In contrast, the spillover effect of the digital presence of manufacturing employees on product quality is not significant ($M_{DPE}$ = 5.58, $M_{No\_DPE}$ = 5.45; $t(133)$ = .76, $p = .45$). Respondents also do not differ in their likeliness to choose descriptive words from the website when describing the product characteristics ($M_{DPE}$ = 1.89, $M_{no\_DPE}$ = 1.87; $t(133)$ = .17, $p = .87$). Using a dummy capturing new vs. used vehicle, average age of the car, and dummies for the most frequent Honda models as controls do not change any of the results.[2]

As supplementary analyses, we found that product quality is not influenced by the digital presence of service employees ($M_{DPE}$ = 5.73, $M_{No\_DPE}$ = 5.52; $t(140)$ = 1.24, $p = .22$) and employee service quality is not influenced by the digital presence of manufacturing employees ($M_{DPE}$ = 5.85, $M_{No\_DPE}$ = 5.78; $t(133)$ = .69, $p = .69$).

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[2] Using measures for overall website service quality, overall employee service quality, and overall product quality produces similar results.

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