Individual differences in interpersonal touch: On the development, validation, and use of the “comfort with interpersonal touch” (CIT) scale

Andrea Webb a, Joann Peck b, *

a University of Wisconsin—Madison, 975 University Avenue, 53706, USA
b University of Wisconsin—Madison, 4341 Grainger Hall, 975 University Avenue, 53706, USA

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Abstract

This research details the development of the “comfort with interpersonal touch” (CIT) scale designed to measure individual differences in interpersonal touch tendencies and preferences. The CIT construct is defined as the degree to which an individual is comfortable with intentional interpersonal touch from or to another person. The scale incorporates the distinction between initiating touch, which is the act of touching someone else, and receiving touch, which is the act of being touched by someone else. Investigation of this construct includes scale development, measure purification, and validation. We situate CIT-initiating and CIT-receiving within an approach–avoidance framework and demonstrate that comfort with initiating touch is more related to approach tendencies such as assertiveness while comfort with receiving touch is more related to avoidant tendencies such as avoiding crowded spaces. While previous research generally finds positive effects of interpersonal touch, we find that these effects, at least in part, depend on an individual’s comfort with interpersonal touch. We discuss theoretical and managerial implications as well as future research opportunities using the CIT scale.

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Keywords: Touch; Interpersonal touch; Nonverbal communication; Individual difference; Scale development; Haptics

Introduction

“If a salesperson touched me on the arm in a retail store, I would be extremely uncomfortable, leave the store, and never come back!” Lisa, age 53.

Interpersonal touch has been frequently touted for its ability to evoke positive responses including greater restaurant tipping (Crusco & Wetzel, 1984; Hornik, 1992; Stephen & Zweigenhaft, 1986), trying a sample in store (Hornik, 1992), buying a new product (Hornik, 1992), participating in a mall-intercept interview (Hornik & Ellis, 1988), or getting a deal from a salesperson (Orth, Bouzdine-Chameeva, & Brand, 2013). As seen in the opening vignette, for some individuals, touch might cause aversive reactions while for others, touch may be a natural part of interaction. Stating that she would be extremely uncomfortable, leave the store, and never come back, Lisa expresses strong displeasure with the idea of being touched by a stranger.

Beyond anecdotal evidence, there is further reason to believe that touch might not produce universally positive effects. Kleinke (1977) revealed that touch had a significant effect on subjects’ willingness to return a dime left in a telephone booth. If a participant was touched, 51% returned a dime to a confederate who said they lost it compared to only 29% of participants who were not touched. While this is a seminal study in the interpersonal touch literature, there were still 49% of participants for whom receiving touch did not have a positive effect. It could be that some individuals are not comfortable with receiving touch, and the effects were not as positive as for others.

Intuitively, we acknowledge that a duality exists in the distinction between initiating touch with someone else and receiving touch from someone else. Various researchers have
recognized this distinction, but most have used observation of initiation and reception of touch within non-stranger dyads (e.g. Hall & Veccia, 1990; Stier & Hall, 1984). As a highly contextual action, the use of interpersonal touch varies greatly depending on the relationship between the two touchers. For most applicability to marketing contexts, we want to understand differences in individuals’ preferences and use of initiating and receiving touch between strangers.

“The field of touch would be well served to go beyond the positive functions served by touch, as well as recognize individual differences” (Hertenstein, 2011, p. 320). The purpose of this paper is to develop this individual difference measure in comfort with interpersonal touch (CIT). In essence, we believe that there is a subset of the population that is uncomfortable with interpersonal touch, and for whom touch may be perceived negatively. “Marketers are much better served with multi-item than single-item measures of their constructs, and they should take the time to develop them” (Churchill, 1979, p. 66). This is our intent. A review of the literature will highlight previous interpersonal touch research. Based on theory from previous research, preliminary scale development, measure purification, and measure validation are conducted. We conclude with a discussion of the interpersonal touch domain and directions for future research.

Theoretical foundation of interpersonal touch

The current touch literature in the marketing field tells us that an individual’s sense of touch can influence product perceptions (Krishna & Morrin, 2008; Peck, Barger, & Webb, 2013; Peck & Childers, 2003a,b, 2006; Peck & Shu, 2009; Peck & Wiggins, 2006) and consumers evaluate a product based on whom or what has previously touched it (Argo, Dahl, & Morales, 2006; Morales & Fitzsimons, 2007). However, we know relatively little about interpersonal touch from a marketing perspective.

As interpersonal touch relates to marketing, there have been several studies detailing the positive effects of receiving touch, especially on compliance (Bohm & Hendricks, 1997; Hornik, 1992; Hornik & Ellis, 1988; Joule & Guéguen, 2007; Willis & Hamm, 1980). For example, when a customer was touched lightly on the upper arm in a retail store, the customer was more likely to both sample and purchase a new product compared to shoppers who were not touched (Hornik, 1992). Individuals who were asked to sign a petition were found to be more compliant if they were briefly touched (Willis & Hamm, 1980), and customers waiting in line more frequently allowed a fellow customer to cut in line when the request was accompanied with a touch (Bohm & Hendricks, 1997). While there is well-documented evidence of positive effects of touch, less attention has been paid to situations in which touch may be perceived negatively.

Martin (2012) demonstrated that negative effects of touch are produced when individuals experience an “accidental interpersonal touch” from a fellow customer while shopping, resulting in more negative brand evaluations, product beliefs, less willingness to pay, and less time spent in-store. The type of touch used to produce this negative effect was a bump from behind, which is outside our conceptualization of intentional interpersonal touch. To understand how a light touch on the upper arm might produce negative effects of touch, we turn to the most frequent mechanism through which interpersonal touch is said to produce effects—affectional responses (Fisher, Rytting, & Heslin, 1976; Levav & Argo, 2010).

An affectional explanation to touch has been proposed to have biological underpinnings that shape our behaviors by suggesting that, “we believe that contact comfort has long served the animal kingdom as a motivating agent for affectional responses” (Harlow, 1958, p. 676). Similarly, touch has often been suggested to produce feelings of warmth and comfort (Major & Heslin, 1982) and to decrease stress arousal (Reite, 1990). Pleasant tactile stimulation that is detected by skin receptors may be neurally linked to stored information in the brain that has been positively associated with touch (Gallace & Spence, 2010). For many people, this linkage results in positive associations of touch.

Foundational studies on interpersonal touch have exposed the complexity of the preference formation, interpretation, and usage of interpersonal touch (Mehrabian, 1981; Montagu, 1979). Just like verbal communication, nonverbal communication has the ability to transmit many different messages. Mehrabian (1981) suggests that nonverbal factors, such as touch, account for more than half of the variability of response in interpersonal communication. Interactions that occur on a daily basis go far beyond verbal communication to include many nonverbal factors as well. Evolutionary psychologists speculate that one’s preference for interpersonal touch arises from a young age and is cultivated through early childhood interactions with others (Bowlby, 1988).

Empirical research has also illuminated various cultural influences that guide the frequency and usage of touch. Hall (1966) suggests that people from “contact” cultures tend to interact at closer distances, maintain more direct body orientation, and touch more frequently as compared to “non-contact” cultures. Various researchers suggest that people from the UK, Northern Europe, North America, and Asia touch each other far less often than people from Latin or South America, or Southern Europe (Hall, 1966; Henley, 1973; Jourard, 1966). For example, Jourard (1966) observed the touch behavior of couples in cafes in San Juan, Puerto Rico and London, England. Couples from Puerto Rico touched each other an average of 180 times per hour, while couples in England averaged zero touches per hour. Beyond cultural factors, researchers have highlighted many of these factors that influence how touch is used and perceived including, but not limited to, status (Henley, 1973), gender (Hall & Veccia, 1990), the relationship between the individuals (Montagu, 1979), the type of touch (Levav & Argo, 2010), and situational norms (Hall, 1996).

We believe that one’s comfort with interpersonal touch may depend on whether they are initiating or receiving touch. Implicitly suggested in previous research (e.g. Hall & Veccia, 1990; Stier & Hall, 1984; Willis & Dodds, 1998), but to our knowledge not empirically tested, is that a duality exists in the concept of interpersonal touch. This is the distinction between the act of touching someone else, which we refer to as initiating touch, and the act of being touched by someone else, which we refer to as receiving touch. When the touch is directed from one person’s hand to another’s arm, the origin of the touch is unambiguous. The
individual reaching their hand to touch the arm of another person is solely responsible for the touch. Unlike a handshake, which can be considered to be bilateral with mutually involved players, a light touch on the upper arm is unilateral and does not arise out of mutual investment.

Interestingly, most of the empirical studies in marketing have manipulated receiving touch (e.g., Hornik, 1992) using situations in which customers are the recipients of touch from a fellow customer or salesperson, yet the effects of initiating touch have been less explored. However, initiation of touch is also very relevant to marketers in that both salesperson and customer’s comfort with initiating touch may influence a retail experience and ultimately sales. A customer may touch a salesperson as a way to seek deals (Orth et al., 2013) or touch a fellow customer as a way to navigate a crowded store or get a better position in a long line. A touchy salesperson may actually drive customers away, which may affect how, when, and where customers shop. Individuals are likely to perceive the initiation and reception of touch differently and may have differing levels of comfort associated with each type of touch.

By examining many of the empirical interpersonal touch studies, especially those related to marketing, it becomes evident that this area of research has both over- and under-emphasized certain issues related to interpersonal touch. Table 1 details some of the empirical studies on interpersonal touch, and from our analysis of the interpersonal touch literature we make three broad realizations. First, it has become evident that interpersonal touch in marketing has over-emphasized positive effects of touch with little acknowledgment of potential negative effects. Second, the literature has over-emphasized research on touch from the receiving perspective and under-emphasized the effects of initiating touch. Finally, there is no individual difference measure relating to comfort with interpersonal touch.

Development of the comfort with interpersonal touch scale

An individual’s comfort with interpersonal touch (CIT) is defined as the degree to which an individual is comfortable with intentional interpersonal touch from or to another person. We believe that an individual’s CIT depends on perceptions of comfort with initiating and with receiving touch. The following series of studies detail the scale development process, see Table 2 for study sample information.

Studies 1a and 1b: item generation and scale purification

Consistent with previous scale development research (Bearden, Netemeyer, & Teel, 1989; Churchill, 1979; Lynch, Netemeyer, Spiller, & Zammit, 2010), a pool of items was generated to capture the CIT construct. Scale item generation occurred using various methods. On the basis of face validity, we generated items from an understanding of the construct via a thorough literature review. Additional items were collected by giving the construct definition to graduate students and requesting that they create items that represent the construct. Upon collection of all items, select items that did not represent the construct were deleted. In total, 64 items were created. The CIT construct was measured using a 7-point Likert scale in which 7 = “Strongly Agree” and 1 = “Strongly Disagree.”

Study 1a

The content validity of the 64 items was assessed in two stages (Bearden et al., 1989). In Study 1a, five judges were given the definition of each dimension (i.e., initiating and receiving) and an example item for each dimension. The judges were asked to carefully and critically engage in this classification task. We considered the judges to be reliable and knowledgeable since all judges were students pursuing masters or doctoral education in marketing or psychology-related fields. The judges were then asked to classify the statements as either of the two dimensions or as “not applicable.” After eliminating items that did not receive the appropriate categorization by at least four of the five judges, 41 items remained. The judges categorized items such as “I can’t help touching people when I am talking to them,” “When shaking someone’s hand, I typically put my left hand on their upper arm,” and “I often reach out to someone I know when I see them” as initiating items. Items such as “During conversation, I don’t mind if people touch me,” “I am comfortable having someone touch me on the shoulder to get my attention,” and “I find myself pulling away if someone touches me” were classified as receiving items. Finally, a few sample items that were concluded to represent neither dimension include, “Emotions are conveyed more effectively through nonverbal communication than verbal” and “I avoid shaking hands with people.”

Study 1b

The remaining items were given to three other judges. This second panel of judges was given the definition of each dimension and were asked to rate each statement as being “not representative at all,” “somewhat representative,” or “clearly representative” of the dimension. Items that were evaluated as “clearly representative” by two judges and no worse than “somewhat representative” by the third judge were retained. This process eliminated four items, and an additional item was eliminated for redundancy, leaving 36 remaining items.

Studies 2 and 3: dimensionality and reliability

Study 2 EFA and CFA

The first sample consisted of five hundred and twenty-four undergraduate students from a Midwestern university, which we refer to as student sample 1 (see Table 2). The students were recruited via an introductory course and received course credit for filling out a questionnaire. The sample was 51% male with a median and modal age of 20.

According to our theoretical basis, comfort with interpersonal touch (CIT) is a multidimensional construct with 2 underlying dimensions—initiating and receiving touch. The scale items’ fit with the other indicators was analyzed using the data from the student sample of undergraduate students. Corrected item-to-total subscale correlations below .50 were deleted (Bearden et al., 1989). This resulted in a reduction to 32 items.

A principle components analysis (PCA), which is often a good initial test of factor structure, was conducted as a preliminary test.
### Table 1
Empirical interpersonal touch studies.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Journal</th>
<th>Effects of touch (positive or negative)</th>
<th>Take into account individual difference related to touch?</th>
<th>Study manipulation</th>
<th>DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alagna, Whitcher, Fisher, &amp; Wicas Bohm &amp; Hendricks</td>
<td>1979</td>
<td>Journal of Counseling Psychology</td>
<td>Positive</td>
<td>Yes, body accessibility scale</td>
<td>Counselor touch client</td>
<td>Evaluation of the counseling experience</td>
</tr>
<tr>
<td>Chaplin, Phillips, Brown, Clanton, &amp; Stein Crusco &amp; Wetzel</td>
<td>2000</td>
<td>Journal of Personality and Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Customer touch fellow customer while waiting in line</td>
<td>Compliance—whether or not allowed to cut in line</td>
</tr>
<tr>
<td>Dolinski</td>
<td>2010</td>
<td>Journal of Nonverbal Behavior</td>
<td>Positive</td>
<td>No</td>
<td>Handshake firmness correlation with personality measures</td>
<td>Personality measures: Big Five</td>
</tr>
<tr>
<td>Erceau &amp; Guéguen</td>
<td>2007</td>
<td>Journal of Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Tipping behavior (% of bill)</td>
<td>Complaince—whether or not the letter was mailed</td>
</tr>
<tr>
<td>Fischer, Ryting &amp; Heslin</td>
<td>1976</td>
<td>Sociometry</td>
<td>Positive</td>
<td>No</td>
<td>Evaluation of salesmen</td>
<td>Evaluation of librarian and library environment</td>
</tr>
<tr>
<td>Fuller et al.</td>
<td>2011</td>
<td>Human Relations</td>
<td>Positive and negative</td>
<td>Yes, touch anxiety scale and touch self-efficacy scale</td>
<td>Subordinate’s perceptions of supervisors’ influence, sincerity, likeability, and support</td>
<td>Helping behavior, Number of picked up items, Response latency</td>
</tr>
<tr>
<td>Guéguen &amp; Fischer-Lokou</td>
<td>2003</td>
<td>Journal of Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Experimenter touched participant and then dropped diskettes</td>
<td>Tipping behavior (% of bill)</td>
</tr>
<tr>
<td>Guéguen &amp; Jacob</td>
<td>2005</td>
<td>Hospitality Management</td>
<td>Positive</td>
<td>No</td>
<td>In-store marketer touch coupled with direct request to buy a product</td>
<td>Purchase</td>
</tr>
<tr>
<td>Guéguen &amp; Jacob</td>
<td>2006</td>
<td>International Journal of Management</td>
<td>Positive</td>
<td>No</td>
<td>In-store marketer touch customer, waiter/waitress touched diner</td>
<td>Participation in study</td>
</tr>
<tr>
<td>Hornik</td>
<td>1992</td>
<td>Journal of Consumer Research</td>
<td>Positive</td>
<td>No</td>
<td>Experimenter touched student and asked for a cigarette</td>
<td>Compliance—give experimenter a cigarette</td>
</tr>
<tr>
<td>Joule &amp; Guéguen</td>
<td>2007</td>
<td>Perceptual and Motor skills</td>
<td>Positive</td>
<td>No</td>
<td>Experimenter sat close/far from participant and touched them</td>
<td>Duration of self-disclosure on intimate topics</td>
</tr>
<tr>
<td>Jourard &amp; Friedman</td>
<td>1970</td>
<td>Journal of Personality and Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Waitress touched hand of diner when handing back change</td>
<td>Amount of alcohol consumed</td>
</tr>
<tr>
<td>Kaufman &amp; Mahoney</td>
<td>1999</td>
<td>The Journal of Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Experimenter touch phone booth user</td>
<td>Compliance—return of dime in phone booth</td>
</tr>
<tr>
<td>Kleinke</td>
<td>1977</td>
<td>Journal of Experimental Social Psychology</td>
<td>Positive</td>
<td>No</td>
<td>Experimenter bumped into fellow customers—“accidental interpersonal touch”</td>
<td>Brand evaluations, product beliefs, willingness to pay, time spent in store</td>
</tr>
<tr>
<td>Martin</td>
<td>2012</td>
<td>Journal of Consumer Research</td>
<td>Negative</td>
<td>No</td>
<td>Tipping behavior on shoulder</td>
<td>Evaluation of experimenter, task performance</td>
</tr>
<tr>
<td>Sussman &amp; Rosenfeld</td>
<td>1978</td>
<td>Journal of Social Psychology</td>
<td>Positive and Negative</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willis &amp; Hamm</td>
<td>1980</td>
<td>Journal of Nonverbal Behavior</td>
<td>Positive</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
before running an exploratory factor analysis (EFA). The PCA was followed by an EFA using maximum likelihood estimation and PROMAX rotation allowing the factors to be correlated. An oblique rotation was chosen over an orthogonal one because the two subdimensions of the scale should be allowed to correlate, but not forced to be uncorrelated. Competing models were tested since model fitting is sensitive and should be done in comparison; “a well-fitting model with a large number of factors may not be interpretable, while a poorer-fitting model may still reveal some interesting features of the data” (Bartholomew, Steele, Moustaki, & Galbraith, 2008, p. 187). A two-factor model ($\chi^2 = 2215.64$, $df = 443$, $p < .001$) was compared against a three-factor which performed worse with respect to model fit since only one item loads highly on the third factor, and therefore, the additional factor contributes little to no value in uncovering the underlying structure in the data ($\chi^2 = 1400.63$, $df = 403$, $p < .001$). Based on both theoretical and statistical insight, the two-factor model suggests that the underlying factors are “comfort with initiating touch” and “comfort with receiving touch” (see Table 3 for factor structure).

The model specifying two latent factors underlying the CIT construct was further tested with a confirmatory factor analysis on the variance covariance matrix using Mplus. We tested both one- and two-factor models, and the one-factor model failed fit tests ($\chi^2 = 998.63$, $df = 35$, $p < .001$, CFI = .71, TLI = .62, RMSEA = .23, SRMR = .12, AIC = 15,778.92). Although CFA is a highly restrictive method for judging dimensionality of a construct, the 2-factor model performed quite well with respect to fit indices ($\chi^2 = 141.85$, $df = 34$, $p < .001$, CFI = .97, TLI = .96, RMSEA = .078, SRMR = .05, AIC = 14,924.15). An RMSEA value close to .06 is thought to indicate good fit (Hu & Bentler, 1999). Thus, the CFA confirms the two-dimensional construct.

We assessed the reliability of the scale. Cronbach’s coefficient alpha for the total scale ($\alpha = .84$); the initiating dimension ($\alpha = .80$) and the receiving dimension ($\alpha = .86$) are

### Table 2
Data samples used for scale development.

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Sample size</th>
<th>CIT mean (SD)</th>
<th>CIT-initiating mean (SD)</th>
<th>CIT-receiving mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>[\alpha]</td>
<td>[\alpha]</td>
<td>[\alpha]</td>
</tr>
<tr>
<td><strong>Item generation and scale purification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study 1a</td>
<td>Graduate students</td>
<td>5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Study 1b</td>
<td>Graduate students</td>
<td>3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Dimensionality and reliability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study 2</td>
<td>Undergraduate students (student sample 1)</td>
<td>524</td>
<td>4.17 (1.02)</td>
<td>3.65 (1.27)</td>
<td>4.78 (1.08)</td>
</tr>
<tr>
<td>Study 2</td>
<td>Undergraduate students (student sample 2)</td>
<td>164</td>
<td>4.16 (1.03)</td>
<td>3.56 (1.27)</td>
<td>4.75 (1.11)</td>
</tr>
<tr>
<td>Study 3</td>
<td>University Faculty and Staff</td>
<td>1360</td>
<td>3.97 (1.20)</td>
<td>3.42 (1.44)</td>
<td>4.52 (1.23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.84]</td>
<td>[.80]</td>
<td>[.86]</td>
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<tr>
<td><strong>Nomological and discriminant validity</strong></td>
<td></td>
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<tr>
<td>Study 4a</td>
<td>University faculty and staff (same as study 3)</td>
<td>1360</td>
<td>3.97 (1.20)</td>
<td>3.42 (1.44)</td>
<td>4.52 (1.23)</td>
</tr>
<tr>
<td>Study 4a, 4b</td>
<td>General US population</td>
<td>473</td>
<td>3.65 (1.35)</td>
<td>3.03 (1.55)</td>
<td>4.27 (1.47)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.90]</td>
<td>[.92]</td>
<td>[.95]</td>
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<tr>
<td><strong>Demographic predictors</strong></td>
<td></td>
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<tr>
<td>Study 5</td>
<td>University faculty and staff (same as study 3)</td>
<td>1360</td>
<td>3.97 (1.20)</td>
<td>3.42 (1.44)</td>
<td>4.52 (1.23)</td>
</tr>
<tr>
<td>Study 5</td>
<td>General US population</td>
<td>1648</td>
<td>3.67 (1.36)</td>
<td>3.00 (1.55)</td>
<td>4.33 (1.53)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.90]</td>
<td>[.90]</td>
<td>[.94]</td>
</tr>
<tr>
<td><strong>Known-group validity</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Study 6a</td>
<td>Electronic gamers (students and start-up company)</td>
<td>40</td>
<td>3.60 (1.04)</td>
<td>2.73 (1.24)</td>
<td>4.47 (1.24)</td>
</tr>
<tr>
<td>Study 6b</td>
<td>Roller derby players</td>
<td>45</td>
<td>4.60 (1.27)</td>
<td>4.26 (1.57)</td>
<td>4.95 (1.31)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>[.82]</td>
<td>[.87]</td>
<td>[.81]</td>
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<td><strong>Predictive validity</strong></td>
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<tr>
<td>Study 7a</td>
<td>General US population (same as study 5)</td>
<td>1648</td>
<td>3.67 (1.36)</td>
<td>3.00 (1.55)</td>
<td>4.33 (1.53)</td>
</tr>
<tr>
<td>Study 7b</td>
<td>General US population</td>
<td>317</td>
<td>3.57 (1.35)</td>
<td>2.86 (1.52)</td>
<td>4.27 (1.51)</td>
</tr>
<tr>
<td>Study 7b</td>
<td>General US population (same as study 4a/4b)</td>
<td>473</td>
<td>3.65 (1.35)</td>
<td>3.03 (1.55)</td>
<td>4.27 (1.47)</td>
</tr>
<tr>
<td>Study 7c</td>
<td>University Campus Visitors</td>
<td>136</td>
<td>4.21 (1.13)</td>
<td>3.81 (1.42)</td>
<td>4.61 (1.21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.91]</td>
<td>[.92]</td>
<td>[.95]</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>[.85]</td>
<td>[.85]</td>
<td>[.87]</td>
</tr>
</tbody>
</table>

NA = not applicable.
Table 3
Exploratory factor analysis: factor loadings.

<table>
<thead>
<tr>
<th></th>
<th>Initiating touch</th>
<th>Receiving touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
<td>.89</td>
</tr>
<tr>
<td>2.</td>
<td>2</td>
<td>.83</td>
</tr>
<tr>
<td>3.</td>
<td>3</td>
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Note: Items were measured using a 7-point Likert scale (strongly disagree to strongly agree). Student sample 1 (n = 524); staff sample (n = 1360). (r) indicates reverse-coded items.


Studiable because they are greater than the general benchmark of .60 (Cronbach, 1951). The correlation between the two dimensions is .48 (p < .01). In order to assess the reliability of a scale, Churchill (1979) suggests that additional data be collected on a new sample to rule out the possibility that the original findings were due to chance. We administered the scale to a new sample of one hundred and sixty-four undergraduate students, called student sample 2 (see Table 2). The overall scale (α = .84), the initiating dimension (α = .80), and the receiving dimension (α = .86) have high coefficient alphas indicating high internal consistency.

Study 3 EFA and CFA

To confirm the results that were found with the student sample in study 2, we conducted further analyses on a sample of individuals consisting of faculty and staff affiliated with the same Midwestern university. An online questionnaire was sent to fourteen thousand two hundred and twenty one university faculty and staff, with about 3% undeliverable. After eliminating respondents who dropped out of the survey early as well as those who were born outside of the U.S., we had one thousand three hundred and sixty useable responses, resulting in a response rate of about 10%. The questionnaire asked participants to respond to our CIT items as well as various other personality-related measures. The staff sample was more heterogeneous than the student sample, which provided greater variation in demographic characteristics.

A PCA and EFA were also conducted on the staff sample. These analyses were conducted with the same items used in the student sample. The EFA produced similar factor loadings as compared with the student sample (see Table 3). A CFA was conducted on the staff sample as well. Similar to the student sample, a one-factor model was tested and did not indicate satisfactory model fit (χ² = 3309.54, df = 35, p < .001, CFI = .72, TLI = .64, RMSEA = .26, SRMR = .11, AIC = 43,264.51), however, the two-factor model performed significantly better with respect to various fit indices (χ² = 290.53, df = 34, p < .001, CFI = .98, TLI = .97, RMSEA = .07, SRMR = .03, AIC = 40,247.50). Thus, both the student and the staff confirmatory factor analyses suggest that the two-factor structure provides the best representation of the data.

Through the EFA and CFA, we carefully considered the item’s factor loadings, cross loadings, communalities, scale brevity, and substantive interest. Recent scale development seems to favor short-form scales over extensive, long surveys and various researchers have acknowledged that scale brevity is a concern (Nenkov, Morrin, Schwartz, Ward, & Hulland, 2008; Netemeyer, Bearden, & Sharma, 2003). “Part of the researcher’s efforts are directed both to encouraging respondent cooperation and to limiting respondent fatigue. Obviously, maximizing reliability by adding items makes the burden on the respondent greater, and the developer needs to give some thought to the trade-off between brevity and reliability” (Netemeyer et al., 2003, 146).

In their psychometric research, Lastovicka, Bettencourt, Huglener, and Kuntze (1999) used EFA with the decision rule to retain items with factor loadings greater than .50, which reduced their pool of items from 60 to 25. We followed this same recommendation as well as deleting items that revealed high cross-loadings across factors. Face validity or substantive interest was also considered when choosing the final items for the scale,
with the hope to minimize redundancy in items and capture the construct sufficiently. All items were verified to have sufficient variance to be able to identify both individuals low and high in comfort with touch. The communality of the individual items, or the amount of the item’s variance explained by the factor structure, is said to be adequate when communalities are around .5. The combination of these decision rules contributed to the reduction of the scale to 6 items, 3 items for the initiating dimension and 3 for the receiving dimension (final scale items are starred in Table 3).

**Study 4a: nomological validity**

After scale development, refinement, and assessment of latent structure, we conducted various validity tests on the CIT scale. These validity tests explored how CIT is related to personality dimensions and human tendencies. We began by seeking to understand the nomological network in which comfort with interpersonal touch resides. We examined how the overall CIT scale and its subdimensions (CIT-initiating and CIT-receiving) relate to other constructs by showing that theoretically related constructs are also empirically related. For this study, we used two different samples of individuals, the university staff as well as individuals from Amazon’s MTurk (see Table 2). We collected various personality-related constructs that we believe are related to one’s comfort with interpersonal touch.

Evolutionary psychologists have long acknowledged that living organisms have evolved to approach pleasurable experiences while avoiding painful experiences; approach motivation being typically connected to concepts of reward, incentive, and satisfaction, and avoidance motivation being connected to concepts of aversion, punishment, and threat (Elliot & Covington, 2001). Emotions, interpreted from an approach–avoidant perspective, are not just construed as a state but have implications for how individuals are both energized and directed (Elliot, Eder, & Harmon-Jones, 2013). An individual who adopts an approach motivation might say, “I want to try to do good things” while one with an avoidance-motivated perspective might say, “I want to try to not do bad things.” The difference between approach and avoidant motivation parallels how we interpret individuals’ comfort with interpersonal touch.

For someone who is comfortable with touch, approaching or drawing near to another person would be natural and produces desirable and pleasurable feelings. On the other hand, a person uncomfortable with touch might be more avoidant-motivated, both because of their personal discomfort, and because of their concern with producing undesirable results from the use of touch. These individuals likely have a greater desire to avoid the possible negative than to approach the possible positive.

Bodily movements have been shown to activate an approach or avoidant mindset. For example, Labbroo and Nielsen (2010) used a manipulation to imagine pulling an object toward themselves, representing approach, while others were told to imagine pushing the object away, representing avoidance. In this same respect, the act of touching someone, in effect, completely eliminates the space between two people. This is a definitive form of approach behavior—especially for the individual initiating the touch. We expect individuals comfortable with touch to have a tendency to be approach-oriented. However, maintaining distance is a form of avoidance behavior so as to not engage in touch. We expect individuals uncomfortable with touch to be avoidance-oriented.

Thus, we have chosen various psychographic measures that tend to be approach-oriented that we expect to correlate positively with comfort with interpersonal touch, and various avoidance-oriented measures that we expect to correlate negatively with comfort with interpersonal touch. First, we suspect that CIT is related to part of the Big 5 personality traits, namely extraversion, agreeableness, and openness to experience. Extraversion, which we believe is positively related to CIT, is associated with social interaction. An extravert is a person who gains energy from the presence of others, is sociable, active, and seeks external stimulation (Costa & McCrae, 1992). Given that these individuals tend to seek out or approach stimulation, we predict that one’s level of comfort with initiating touch will tend to be more correlated with extraversion than receiving touch. As compared to receiving touch, initiating touch is more active in nature and requires a social investment, and therefore an individual who is more comfortable with initiating touch would be more likely to be extraverted. Nonetheless, we expect that both our comfort with initiating and receiving dimensions will yield a positive correlation.

Agreeableness is the tendency to be compassionate and cooperative and is a measure of one’s helpful and well-tempered nature (Costa & McCrae, 1992; Gosling, Rentfrow, & Swann, 2003). Since people who are agreeable tend to be easy-going and warm toward other people, we believe that this will correlate positively with CIT as well as both dimensions independently. Openness to experience reflects one’s degree of intellectual curiosity and a preference for novelty (Costa & McCrae, 1992; Gosling et al., 2003). These people tend to prefer a variety of experience, and therefore, the act of touching or being touched by a stranger may be exciting and interesting to them. We anticipate that one’s comfort with initiating and receiving touch will positively correlate with openness to experience.

Assertiveness, another psychographic characteristic, is considered to be the degree to which you stick up for yourself, take charge of a situation, and act in a way that you feel is right (Rathus, 1973). This measure is undoubtedly an approach-oriented construct since it relies heavily on taking action. We anticipate that assertiveness will positively correlate with one’s overall comfort with touch, moreover an individual who is comfortable with initiating touch will be more assertive than an individual who is not comfortable with initiating touch. We believe that one’s CIT-initiating will be more correlated with assertiveness than one’s CIT-receiving. An individual’s tendency and desire to initiate physical contact with others is likely to be a manifestation of their preference to assert themselves.

Further insight into avoidant tendencies may come from a more clinical psychopathological perspective. Individuals who suffer from agoraphobia have a fear of “open spaces” and uncontrollable social situations and are prone to avoid large, crowded public spaces (Ost, 1990). We anticipate that individuals who are uncomfortable with receiving interpersonal touch will have greater tendency to be agoraphobic. Similarly, individuals who
suffer from claustrophobia, or the fear of small spaces, may also be impacted by interpersonal touch (Ost, 2006). We predict that if we know an individual is claustrophobic or agoraphobic, they will be more uncomfortable with touch in general, but particularly receiving touch.

Finally, approach/avoidance tendencies have been linked to two general motivation systems impact behavior and affect: the behavioral inhibition system (BIS) and the behavioral activation system (BAS) (Carver & White, 1994). The BAS/BIS is a direct measure of approach–avoidance tendencies and we expect that BAS, which regulates reactions to appetitive motivation and movement toward goals, to be positively correlated with CIT and its subdimensions. BIS, which regulates reactions to aversive motivation and causes inhibition from moving toward goals, is thought to negatively correlate with CIT and its subdimensions. In a similar vein, we predict that individuals who are high in CIT will also be more likely to cope with problems using approach-oriented behaviors. Using a brief approach/avoidance coping scale (Finset, Steine, Haugli, Steen, & Laerum, 2002), we anticipate that one’s desire to approach (avoid) coping of socio-emotional issues will correlate positively (negatively) with both of our subdimensions.

Study 4a results

To assess nomological validity, Pearson correlation coefficients were calculated between the psychometric constructs discussed above. To test for significant difference between the strength of the association across our two subdimensions, Steiger’s $z$ was calculated (Steiger, 1980). For descriptive statistics and correlations of the various scales, see Table 4. As predicted, extraversion is positively related to CIT ($r = .41, p < .01$). Both the initiating and the receiving dimensions are positively related to extraversion as well ($r = .43, p < .01; r = .28, p < .01$, respectively), but the initiating dimension has a stronger association (Steiger’s $z = 6.50, p < .01$). This suggests that the sociability of a person is related to the extent to which they are comfortable with interpersonal touch, and an individual’s comfort with initiating touch is more related to their level of extraversion. Similarly, both agreeableness ($r = .20, p < .01$) and openness to experience ($r = .14, p < .01$) were related to one’s CIT. Agreeableness was more strongly correlated with CIT-receiving than CIT-initiating (Steiger’s $z = −3.29, p < .01$), which makes sense given that being agreeable suggests a degree of easy-goingness that an individual would be more likely to have when they don’t mind whether or not they are touched by others. As for openness to experience, there was no difference for openness to experience between CIT-initiating and CIT-receiving (Steiger’s $z = −1.52, p > .10$).

Our predictions for the relationship between assertiveness and CIT held as well. There is a positive relationship between CIT and assertiveness ($r = .21, p < .01$), and the relationship is stronger for the initiating dimension ($r = .23, p < .01$) than it is for the receiving dimension ($r = .14, p < .01$; Steiger’s $z = 3.88, p < .01$). An individual’s comfort with initiating touch is positively related to an individual’s tendency to be assertive more so than is comfort with receiving touch.

Personality traits directly related to approach behavior (i.e., BAS and Socio-emotional approach coping) were anticipated to positively relate to CIT. For both constructs the correlations
were in the expected direction (BAS-CIT \( r = .24, p < .01 \); Coping-CIT \( r = .28, p < .01 \)). Furthermore, the results indicate that both constructs correlate more positively with comfort with initiating touch than comfort with receiving touch. This is strong evidence for the idea that being comfortable with touch, especially initiating touch, is an approach-oriented tendency.

With respect to avoidance-oriented personality measures, we found strong support for the assertion that discomfort with touch is related to avoidance. These results demonstrate that the more an individual is comfortable with touch, the less likely they are to suffer from agoraphobia (\( -.16, p < .01 \)), and this is true for both the initiating (\( -.10, p < .01 \)) and the receiving dimensions of the CIT scale (\( -.18, p < .01 \); Steiger’s \( z = 3.35, p < .01 \)). Individuals who are uncomfortable with touch from strangers also experience negative feelings and attitudes toward public social spaces. The relationship with claustrophobia was similar. There was a negative relationship between CIT and claustrophobia (\( -.11, p < .01 \)), and this was true mostly for individuals who were uncomfortable with receiving touch (Steiger’s \( z = 4.98, p < .01 \)).

The BIS produced correlations with CIT as we would expect, however, was not significantly correlated with CIT-receiving (\( -.062, N.S. \)). Thus, our predictions for the BIS-CIT relationship were only partially supported. Finally, one’s tendency to cope socio-emotionally through avoidance was negatively correlated with CIT (\( -.14, p < .01 \)), and this was true for both the initiating and receiving dimensions as well. Taken together, the CIT construct is well situated in a nomological net of approach and avoidance behaviors with individuals comfortable with touch more likely to be approach oriented, while individuals uncomfortable with touch more likely to be avoidance oriented.

**Study 4b: discriminant validity**

The purpose of demonstrating discriminant validity is to determine the extent to which the CIT construct is truly novel and not a reflection of other closely related constructs. Scales can be invalidated and useless if they correlate too highly with other scales in which they were intended to differ. Thus, the CIT scale was tested in relation to the Fuller et al. (2011) Touch Anxiety scale and to the Peck and Childers (2003a) Need for Touch scale. These two scales are related to touching preferences—Touch Anxiety (TANX) is avoidance-oriented while Need for Touch (NFT) captures a more outward or approach-oriented tendency.

The TANX scale was developed to test individuals’ anxiety with using touch in the workplace (Fuller et al., 2011). This scale captures an anxiety-related trait and measures an individual’s avoidance-motivation toward touch. All of the items in the TANX scale are from the perspective of “initiating touch” and include items such as, “It scares me to think that I could damage my relationship with someone at work if I touch them and they take it the wrong way.” The CIT scale differs from TANX scale in that (1) CIT incorporates both initiating items and receiving items, (2) TANX limits the scope of the scale to touch within the workplace while CIT is a more general measure, and (3) TANX captures an individual’s use of touch for fear of negative evaluation rather than the individual’s intrinsic comfort with interpersonal touch. Therefore, it is predicted that the CIT scale will have a slight negative correlation with the TANX scale.

In marketing, Peck and Childers (2003a) scale on ‘Need for Touch’ (NFT) investigates individuals’ preference for haptic information, specifically as it relates to touching products. While an individual touching a product is fundamentally different from an individual touching another individual, one might think that we hold a general preference for touch. A comparison will be made to ensure that NFT and CIT are not measuring the same construct. It is predicted that the CIT scale will have a slight positive correlation with the NFT scale. It is also expected that since NFT measures initiating product touch, it will be more strongly related to the initiating dimension than the receiving dimension of CIT.

**Study 4b sample and results**

We used the same MTurk participant pool from study 4a (\( N = 473 \)) to investigate the relationship between CIT, TANX, and NFT. As predicted, the results show that TANX (\( \alpha = .94 \)) and CIT measure distinct constructs. Using the Pearson correlation coefficient, there is a negative relationship between CIT and TANX (\( -.14, p < .01 \)). As predicted, both the initiating dimension (\( -.14, p < .01 \)) and the receiving dimension (\( -.10, p < .05 \)) have negative correlations, suggesting that an individual who is more comfortable with interpersonal touch will likely feel less touch anxiety. There is no difference between the TANX correlation with CIT-initiating and CIT-receiving (see Table 4). We also demonstrate discriminant validity with NFT (\( \alpha = .95 \)). We find a positive relationship between CIT and NFT (.26, \( p < .01 \)), which is expected given that NFT is an approach tendency like CIT. The initiating dimension (.27, \( p < .01 \)) and receiving dimension (.19, \( p < .01 \)) are correlated as well. As predicted, NFT is more highly correlated with CIT-initiating than CIT-receiving since NFT is an outward-touch focused measure similar to CIT-initiating. These results of moderate and significant correlations are consistent with methods for assessing discriminant validity (Netemeyer et al., 2003). For example, Tian, Bearden, and Hunter (2001) provide evidence of discriminant validity of their measure of consumers’ need for uniqueness via a moderate correlation with a measure of optimum stimulation level. This test provides evidence of discriminant validity between CIT, NFT, and TANX.

**Study 5: demographic predictors of CIT**

Gender is an important factor in understanding the use and preference for interpersonal touch. Despite equivocal support for gender preferences and use of touch, we consider how gender and comfort with interpersonal touch are related. We are also interested in the relationship between comfort with interpersonal touch and age. Some studies have found that older individuals tend to touch younger ones more than vice versa (Stier & Hall, 1984), which may suggest that older individuals are more comfortable with initiating touch, while younger individuals are more comfortable receiving touch. However, age is a factor that can be extremely confounded with many other factors, including status or type of
relationship (e.g. parent–child), especially when age differences are extreme (Hall, 1996).

**Study 5 sample**

To test whether or not CIT varies by gender and age, we conducted a study of online participants from across the U.S. One thousand six hundred and forty-eight individuals between the ages of 18 to 76 participated. We combined this online sample with the data from the university staff sample to be able to create a widespread representation of interpersonal touch preferences in the population. All together, three thousand and eight individuals filled out the CIT measure. Gender and age were not forced responses; consequently, 17 participants did not indicate gender and 1 did not indicate age.

**Study 5 results**

We ran simple linear regressions to test the effect of gender and age on comfort with interpersonal touch and its subdimensions. We find that women score statistically significantly higher on the CIT scale as compared to men ($M_{\text{Male}} = 3.71, M_{\text{Female}} = 3.88, \beta = .16, t(2989) = 3.39, p < .001$). This is also the case for the initiating dimension ($M_{\text{Male}} = 2.99, M_{\text{Female}} = 3.35, \beta = .36, t(2989) = 6.50, p < .001$), however, there are no differences between genders on the receiving dimension ($M_{\text{Male}} = 4.44, M_{\text{Female}} = 4.40, \beta = .03, t(2989) = -.73, p = .47$). This effect could be explained by various meta-analytic reviews that reveal women are innately more “tender-minded” and “nurturant” than men (Eagly & Crowley, 1986; Feingold, 1994). Indeed, the idea of the “maternal instinct” has long been asserted in psychological texts (Reed, 1923). A wide range of this research suggests that the female role, which emphasizes nurturance and emotional expressiveness, makes it easier for women to provide social support in close relationships, whereas the male role, which typically emphasizes achievement, autonomy, and emotional control, makes it more difficult for men to provide social support (Barbee et al., 1993). Thus, it is not surprising that females tend to be more comfortable initiating touch than males.

Regarding age, we find that individuals who are older tend to be more comfortable with interpersonal touch than younger individuals ($\beta = .01, t(3005) = 6.18, p < .001$) such that an additional year in age corresponds to a .01 increase in one’s CIT level. This holds for both initiating and receiving touch. As an individual ages, they also become more comfortable with initiating touch with others ($\beta = .02, t(3005) = 8.51, p < .001$) as well as receiving touch from others ($\beta = .004, t(3005) = 2.26, p = .02$). Therefore, both age and gender are related to one’s level of comfort with interpersonal touch, specifically females and older individuals tend to be more comfortable with touch than males and younger individuals.

**Study 6a: known-group validity—electronic gamers**

Known-group validity is used to investigate whether or not the measure produces results for a group of individuals who are likely to score high or low on the developed scale (Netemeyer et al., 2003). Previous literature has used known-group validity to establish the usefulness and validation of the scale. For example, Bearden, Hardesty, and Rose (2001) demonstrated that members of the American Council on Consumer Interests (ACCI), which is an organization that fights for the well-being of consumers, scored higher on their consumer self-confidence measure than the general population. Other researchers have used faculty and students for known group validity assuming that faculty would be more skeptical than students to verify a skepticism toward advertising scale (Obermiller & Spangenberg, 1998).

**Study 6a sample**

We tested known-group validity on a population believed to be uncomfortable with interpersonal touch, “electronic gamers.” Video games typically involve more interactivity than, for example, most television programs, but video games are not as interactive as a face-to-face conversation (Crawford, 2012). Extraversion has been found to be positively related to the time a person spends in recreational activity with others (Diener, Larsen, & Emmons, 1984). However, in the online gaming environment, social interactions are relatively shallow compared to real life relationships (Parks & Floyd, 1996), and the use of online entertainment such as gaming tends to be positively related to introversion (Mitchell, Lebow, Uribe, Grathouse, & Shoger, 2011). Since individuals who tend to be more comfortable with touch also tend to be more extraverted, we believe that individuals who are avid gamers will demonstrate strong known-group validity of the scale.

We recruited individuals from an undergraduate student gaming organization as well as a local online gaming start-up company. We consider electronic gaming (EG) to be the engagement in any electronic game (i.e. computer, video, mobile games) and can involve one or multiple players. We believe that an EG enthusiast may engage in significant electronic interaction over human interaction, which could be negatively related to one’s level of CIT. Forty EG players participated in our study.

**Study 6a results**

The results from the EG players are compared to the university staff population (N = 1360) and the second undergraduate sample (N = 164) (see Fig. 1a). As predicted, EG players scored significantly lower on the CIT scale than did the staff population ($M_{\text{EG}} = 3.60, M_{\text{Staff}} = 3.97, t(1398) = 1.93, p = .05$). The same was true for the initiating dimension as well ($M_{\text{EG}} = 2.73, M_{\text{Staff}} = 3.42, t(1398) = 3.00, p = .003$), however, EG players were not significantly different from the staff population with respect to their comfort with receiving touch ($M_{\text{EG}} = 4.47, M_{\text{Staff}} = 4.52, t(1398) = .25, p = .80$). These effects replicated with the student sample with no statistical difference on the receiving dimension ($M_{\text{EG}} = 4.47, M_{\text{Student}} = 4.75, t(202) = 1.40, p = .16$).

**Study 6b: known-group validity—roller derby players**

To test known-group validity for a group thought to be high in comfort with interpersonal touch, we chose roller derby players. Roller derby (RD) is a high-contact sport that involves a lot of touching, pushing, and blocking, and is played on a flat, oval track with two teams trying to win the most points. Roller...
derby waned in popularity but made a comeback in 2003 due to the Texas Rollergirls “who wanted to bring to life a sport allowing participants to be both aggressive and gorgeous. They realized that the sport had the ability to inspire other women, provide young girls with powerful role models and thrill audiences with a blend of hard-hitting action and kitschy fun” (Mad Rollin’ Dolls, 2004).

Driving our decision to choose electronic gamers for a group thought to be low in CIT was the connection between gamers and introversive tendencies. Likewise, RD players have been selected to represent a group thought to be high in CIT for their extraverted nature and experience with personal physical interaction. A quote from a roller derby player’s blog illustrates this emphatically stating, “Like many of my derby brethren, I’m a loud mouth. When I took my Myers Briggs test they practically sent back the results with the E for Extrovert underlined, bold and highlighted with glitter” (Betty, 2014).

**Study 6b sample**

We contacted our city’s local Roller Derby team and administered questionnaires to its members. Forty-five female RD players participated in our study. It was predicted that RD players would be higher in comfort with interpersonal touch than the general population.

**Study 6b results**

The results from the RD players are compared to the university staff population as well as the undergraduate students (see Fig. 1b). Since RD players are all women, only the female staff (N = 1014) and female undergraduates (N = 76) were used as the benchmark. As predicted, RD players scored significantly higher on the CIT scale ($M_{RD} = 4.60$, $M_{Staff} = 4.04$, $t(1057) = 3.08$, $p = .002$), the initiating dimension ($M_{RD} = 4.26$, $M_{Staff} = 3.54$, $t(1057) = .325$, $p < .001$), as well as the receiving dimension ($M_{RD} = 4.95$, $M_{Staff} = 4.54$, $t(1057) = 2.22$, $p = .03$) when compared to the
female university staff population. These effects replicated with the student sample as well except the difference on the receiving dimension was not statistically significant ($M_{RD} = 4.95$, $M_{Student} = 4.68$, $t(114) = 1.45, p = .25$). These studies provide initial evidence that the CIT measure has known-group validity by showing that Roller Derby players tend to score higher and electronic gamers tend to score lower on the CIT measure than a general population.

**Study 7a: predictive validity—service enjoyment**

The ability of the CIT scale to predict marketing-related behaviors is a test of predictive validity. We are interested in whether or not one’s level of comfort with interpersonal touch can predict enjoyment of specific consumer services that require touch. Consumers uncomfortable with touch will be less likely to enjoy services in which touch is typically a part of the service, such as “getting a massage,” “getting my hair cut,” “getting a clothing item custom tailored,” or “ballroom dancing.” Whereas, comfort with interpersonal touch should not be related to services that do not involve touch, such as “buying books online.”

**Pretest**

This pretest was designed to ensure that the services we selected were consistent with being high or low in touch. That is, we sought to verify our assumptions on the amount of touch each of these services required. We asked eighty-five individuals on Amazon’s Mechanical Turk to indicate on a 7-point Likert scale the extent to which the services involve physical touch between two people ($1 = \text{no touch at all}, 7 = \text{a lot of touch}$). Services that we anticipated to be high in touch ($M_{Massage} = 6.88$, $M_{Haircut} = 5.41$, $M_{Tailoring} = 5.01$, $M_{Dancing} = 5.45$) were indeed rated to involve more touch than a service anticipated to be low in touch ($M_{Books} = 1.28$).

**Study 7a sample**

One thousand six hundred and forty eight individuals from our online study were used for these predictive validity tests. Participants were asked to indicate (on a 7-point Likert scale) the extent to which they enjoy engaging in the services listed above. These services contain some necessary or great potential for interpersonal touch or lack tactile interaction all together. We believe that individuals who are uncomfortable with interpersonal touch would be less likely to enjoy these touch-related services and avoid engaging in them.

**Study 7a results**

The results are as predicted. Individuals who are more comfortable with interpersonal touch (1 SD above the mean) were more likely to enjoy getting a massage while those who are uncomfortable (1 SD below the mean) reported less enjoyment ($M_{High} = 6.01$, $M_{Low} = 5.31$, $\beta = .26$, $t(1646) = 9.61$, $p < .001$). Similar relationships were found for enjoyment of a haircut ($M_{High} = 4.83$, $M_{Low} = 4.30$, $\beta = .20$, $t(1646) = 7.02$, $p < .001$), getting a clothing item custom tailored ($M_{High} = 4.79$, $M_{Low} = 4.32$, $\beta = .17$, $t(1646) = 6.29$, $p < .001$), and ballroom dancing ($M_{High} = 3.80$, $M_{Low} = 3.23$, $\beta = .21$, $t(1646) = 6.63$, $p < .001$). This effect held when isolating the dimensions as well—both those comfortable with receiving and initiating touch were more likely to engage in various touch-related services (see methodological details appendix for additional analyses).

However, when participants were asked about their engagement in services that did not contain the possibility of touch (e.g. buying books online), there was no difference between those who are low or high in comfort with interpersonal touch ($M_{High} = 5.09$, $M_{Low} = 5.19$, $\beta = -.04$, $t(1646) = -1.48$, $p > .10$). As predicted, these results suggest that one’s comfort with interpersonal touch is related to one’s enjoyment and pursuit of various consumer services. Thus, participants comfortable with interpersonal touch were more likely to enjoy these touch-related services while those who are uncomfortable reported less enjoyment.

**Study 7b: predictive validity—shopping behaviors**

The previous predictive validity test demonstrated that individuals seek out or avoid differing services based on their level of comfort with touch. This study will demonstrate that our CIT measure can also distinguish individuals based on general human behavioral tendencies. One’s level of comfort with interpersonal touch reveals tendencies in shopping behaviors. We classified various shopping behaviors into approach-oriented behaviors of experiential shopping and salesperson attention, and avoidance-oriented of avoiding crowds and consumer self-confidence. All measures were captured on 7-point Likert scales from strongly disagree to strongly agree.

Three hundred and seventeen individuals from Amazon’s Mechanical Turk were questioned about their preferences for retail shopping. Participants from a previous MTurk study ($N = 473$) reported behavioral tendencies as well and are used in these analyses (see Table 2). The experiential shopping motivation scale asks participants to indicate various reasons for shopping including: “to experience interesting sights, sounds and smells” (Dawson, Bloch, & Ridgway, 1990). This is expected to positively correlate with CIT since consumers comfortable with interpersonal touch are more likely to seek out unique shopping experiences. We were also interested in the approach-oriented behavior of engagement with salespeople, which we measured using the item “I enjoy attention from salespeople.”

To capture avoidance-oriented behaviors, we asked participants to indicate the extent to which they avoid crowds with the following two items: “I try to avoid crowds” and “I enjoy busy, noisy places” (reverse-coded). We also used a well-established measure of consumer self-confidence with items such as “I am afraid to ask to speak to the manager” (Bearden et al., 2001). We anticipate that individuals who are uncomfortable with touch will have behavioral tendencies to avoid overly populated retail environments while individuals comfortable with touch will seek out attention from salespeople.

**Study 7b results**

As we predicted, there are direct relationships between individuals’ comfort with interpersonal touch and engagement...
in interational shopping behaviors. Specifically, one’s level of CIT predicts experiential shopping behaviors ($M_{High \ CIT} = 3.87, M_{Low \ CIT} = 2.87, \beta = .37, t(471) = 7.90, p < .001). We also found that individuals comfortable with touch were more likely to enjoy attention from salespeople ($M_{High \ CIT} = 3.02, M_{Low \ CIT} = 1.82, \beta = .45, t(315) = 7.93, p < .001). These effects held true for both subdimensions as well. As for avoidant behaviors, individuals comfortable with touch were less likely to avoid crowded spaces ($M_{High \ CIT} = 4.70, M_{Low \ CIT} = 5.87, \beta = -.44, t(315) = -7.31, p < .001) and had less lack of confidence in retail environments ($M_{High \ CIT} = 2.42, M_{Low \ CIT} = 2.72, \beta = -.11, t(471) = -2.99, p = .003). For additional analyses, see the methodological details appendix. These results suggest that comfort with interpersonal touch can differentially predict the types of behaviors in which a consumer will engage. Consumers who are comfortable with touch tend to be approach oriented and will seek out interaction within retail contexts. Those who are uncomfortable with touch will avoid interaction and may shop more selectively based on when stores are less crowded or when interaction is minimized.

**Study 7c: predictive validity—campus tour study**

Our final predictive test of the CIT scale seeks to understand how actual touch impacts consumers’ attitudes. In this study we are interested in whether the positive effects of touch still hold after taking into account an individual’s comfort with interpersonal touch. We used a context similar to the library research study by Fisher et al. (1976) in which a librarian’s touch had a positive influence on students’ perception of the librarian and the library environment. We tested the effects of touch on the evaluation of the campus and a tour guide after a university campus tour.

**Study 7c sample**

One hundred and thirty-six individuals participated in our study. Participants were individuals visiting our university’s campus for a campus tour over the course of 2 weeks. One day of data collection was eliminated due to extreme weather that may have impacted participant attitudes (additional analyses with this day included can be found in the methodological details appendix). The participants ranged in age from 15 to 65, with 58.1% of the participants between the ages of 15 and 20, 36.8% of the participants between the ages of 41 and 55, and the remainder across other age ranges. Given that this was mostly high school juniors and seniors touring the university with their parents, this bimodal age distribution seems logical.

**Procedure**

We collaborated with our university’s campus visitor and information programs office to conduct this study. This division of our university employs student campus tour guides (TGs) who give walking tours of the campus. The sample encompassed those who were visiting the university for the purpose of future admittance. For this study, we manipulated touch by involving the TGs as our confederates. Prior to experimentation, all confederates were given a training course to properly conduct the touch manipulation. Our study design consisted of touch (with the exclusion of children) and no touch tours in which the tour guide would touch (or not touch) every individual at some point during the tour. The touch was operationalized as a light touch anywhere on the arm between the elbow and the shoulder. The training course involved verbal and written instruction, a visual demonstration of unobtrusive touch, an opportunity for the confederates to practice touch, and a question–answer session.

For our study, two tour guides conducted each tour. One guide was instructed to conduct the tour as they normally would and led the tour guiding the visitors from location to location. This lead guide was instructed to not touch any visitors in either condition, and to report to us if any visitors were inadvertently touched. The second guide, our confederate, was given the role of “toucher.” This “toucher” guide was instructed to mingle through the tour group and either touch (or not touch) all individuals. The experimenters stressed the criticality of maintaining consistency in interaction across the touch and no touch tours. Tour guides were not aware of the research hypothesis. Upon returning from the tour, the visitors were approached by an experimenter who asked for their participation in a voluntary survey.

**Measures**

Using the same measures as Fisher et al. (1976), the participant’s attitude toward the tour guide (the confederate) was measured on a 7-point semantic differential scale. Since two tour guides were present during each tour, we collected evaluations of both of the guides to ensure that visitors were not confused about which guide to evaluate. The evaluation of the guide who touched visitors was the dependent variable of interest. At the top of the questionnaire, a blank line prompted the participant to write down the name of “tour guide #1” and “tour guide #2.” We intentionally did not call one tour guide the “lead guide” on the questionnaire so as to avoid any implications of status or authority of one guide over the other. Evaluations of the guides were measured separately with prompts that read, “I thought the campus tour guide #1 [2] was:” and the questionnaire provided the following bipolar adjective pairs: “unfriendly–friendly,” “negative–positive,” “not helpful–helpful,” and “bad–good.” The participant’s evaluation of the campus was also measured using a 7-point semantic differential scale. The prompt read, “Based on my first impression, I think the campus is:” with the following bipolar adjective pairs: “unattractive–attractive,” “negative–positive,” “uncomfortable–comfortable,” and “bad–good.”

**Study 7c results**

We predicted that an individual’s comfort with receiving interpersonal touch would moderate the relationship between receiving touch from a stranger and their evaluation of the campus and of the tour guide. We investigated results for our two main dependent variables: overall evaluation of the tour guide toucher and overall evaluation of the university campus. Participants’ scores on the receiving dimension of the CIT scale
were aggregated to form a composite measure (CIT-receiving \( \alpha = .87 \)), and that measure was mean-centered. Additional analyses can be found in the methodological details appendix.

A regression analysis was performed on the evaluation of the tour guide with independent variables being the touch condition, individual difference in CIT receiving dimension, and their interaction. There was no main effect of the touch condition on the evaluation of the tour guide \((\beta = -.05, t(132) = -.82, p = .41)\) and no main effect of CIT-receiving on the evaluation of the guide \((\beta = .03, t(132) = 1.29, p = .20)\), but there was a significant interaction of CIT-receiving \(\times\) Touch \((\beta = .10, t(132) = 1.95, p = .05)\).

The effect of the touch condition was positive and significant across levels of CIT-receiving \((\beta = .09, t(132) = 2.75, p = .007)\), while the effect of the no touch condition was not significant across levels of CIT-receiving \((\beta = -.018, t(132) = -.41, p = .69)\). To explore the interaction, we used a spotlight analysis (Spiller, Fitzsimons, Lynch, & McClelland, 2013) at one standard deviation above and below the mean of CIT-receiving (see Fig. 2a). A spotlight analysis at one standard deviation above the mean of CIT-receiving did not indicate a statistically significant effect \((M_{Touch} = 6.94, M_{No\ Touch} = 6.86, t(132) = .81, p = .42)\). A similar spotlight analysis at one standard deviation below the mean CIT-receiving score showed that individuals low in comfort with touch evaluated the tour guide less favorably when touched compared to not touched \((M_{Touch} = 6.73, M_{No\ Touch} = 6.90, t(132) = -2.03, p = .04)\).

We found similar effects on the evaluation of the university campus (see Fig. 2b). There was no main effect of the touch condition on the evaluation of the campus \((\beta = -.18, t(132) = -1.32, p = .19)\) and no main effect of CIT-receiving on the evaluation of the campus \((\beta = .03, t(132) = .57, p = .57)\), however, there was a significant CIT-receiving \(\times\) Touch interaction \((\beta = .24, t(132) = 2.04, p = .04)\). The effect of the touch condition was positive and significant across levels of CIT-receiving \((\beta = -.24, t(132) = 2.21, p = .03)\), while the effect of the no touch condition was not significant across levels of CIT-receiving \((\beta = -.09, t(132) = -.91, p = .36)\). A spotlight analysis demonstrates that individuals low in CIT-receiving evaluated the campus less favorably when touched compared to not touched \((M_{Touch} = 5.93, M_{No\ Touch} = 6.41, t(132) = -2.44, p = .02)\), but the evaluation of the campus was not statistically significant for individuals high in CIT-receiving when touched compared to not touched \((M_{Touch} = 6.31, M_{No\ Touch} = 6.20, t(132) = .54, p = .59)\).

For both of our dependent variables, we see that individuals who are uncomfortable with touch are negatively affected by the touch, however, comfortable individuals are not given the boost that we would expect from touch. When we examine the nature of our data, we realize that there are ceiling effects that may be contributing to this lack of significant difference. Both the evaluation of the tour guide as well as the evaluation of the campus had extremely high overall means \((M_{Guide} = 6.84, M_{Campus} = 6.18\), measured on 7-point Likert scale). Post hoc, this makes intuitive sense. The individuals who are visiting campus for a tour are inherently interested in the campus and may have a pre-existing favorable disposition toward the university. Moreover, the tour guides are selected because they tend to be very sociable, friendly students who bring energy and enthusiasm to the university tour. This study suggests that the CIT-receiving scale can identify individuals who are comfortable and uncomfortable with receiving touch, and it demonstrates that actual touch can cause these individuals to form differing perceptions of physical interpersonal contact.

**General discussion and future research**

This research develops a measure of comfort with interpersonal touch (CIT) for the purposes of understanding consumers’ preferences for tactile communication and interaction, which is reflected by two related scale dimensions: comfort with initiating touch and comfort with receiving touch. Our intent through the use of these dimensions is to show that individuals may have a generalized preference for touch, but also may have more subtle preferences for the initiation or reception of touch. In fact, a recent publication (Orth et al., 2013), in the context of interpersonal touch, used a measure of preference of product touch (Peck & Childers, 2003a) because there is no current measure of the individual difference in comfort with interpersonal touch. Product touch and interpersonal touch are theoretically distinct concepts, which we demonstrate in this article through discriminant validity. Touching objects or products should be treated differently than touching people since the decisions for use of touch and the effects it produces vary greatly. It is evident that this individual difference measure has great potential to aid in the clarification of existing effects of interpersonal touch in marketing contexts and to explore new contexts in which touch influences consumers’ choices.

Comfort with interpersonal touch may also fit into broader theoretical contexts through the use of personal space and preferences for socially dense retail environments. Edward Hall coined the term “proxemics” in its relation to distance and communication (Hall, 1966). Hall’s (1966) study of proxemics investigates the ways in which individuals use physical space in their interactions with others and how this use of space influences behavior. Some theorists concerned with proxemics have suggested that culture or geographical factors impact our use of space. That is, individuals who live in colder climates use relatively large physical distances and engage in little physical interaction when they communicate, whereas individuals who live in warmer climates prefer closer distances and more physical interaction in communication (Lustig & Koester, 1996; Sussman & Rosenfeld, 1982). Even within a culture, one’s comfort with interpersonal touch may illuminate concerns related to social crowding, use of retail space, and interpersonal interaction in confined spaces.

Currently, this research has been limited to studies within the United States, a “noncontact” culture. Although we believe that within each culture, an individual difference in CIT exists, understanding how a contact culture would perceive initiating and receiving touch would expand our knowledge of the CIT construct. Perhaps individuals in contact cultures would...
experience offense at the lack of touch from a stranger, rather than the overuse of touch. Investigating how consumers’ preferences for touch across different cultures impact purchase decisions is a promising area of future research. While Lisa indicates in the opening vignette that she would leave the store and never come back if touched by a salesperson, this needs to be empirically tested. It is our hope that the development of the CIT scale opens up many avenues for insights into a more thorough and nuanced understanding of interpersonal touch. This construct is one that is of great importance for research that is conducted in field experiments where consumers are making real decisions regarding interaction and consumption. Shopper studies in the field can provide deeper insights (e.g., Inman, Winer, & Ferraro, 2009) and the effects of CIT should be examined in the store environment. The dimensions of receiving and initiating CIT could be looked at independently. Most of the marketing studies involve a consumer receiving touch from a salesperson. In these cases, the receiving dimension of CIT could be isolated and used. Comfort with initiating touch could also be measured and applied to a setting where a salesperson is trained to either touch or not touch customers. Perhaps by repeatedly touching, a salesperson who is uncomfortable with initiating touch may grow to be more comfortable. Managerially, the use of initiating touch seems to be very relevant. By attaining a salesperson’s level of comfort with initiating touch and tracking selling effectiveness or performance, a manager could explore different interpersonal touch modifications that may increase sales.

It is also possible that the effects of touch have a lasting influence on consumers. We know from this research and previous research that touch has effects on people immediately after the social interaction; however, we know less about the long-term consequences of being touched. Many researchers cite compliance effects with touch (e.g., Hornik, 1992), but perhaps individuals are simply complying with a request in order to exit the situation as quickly as possible, especially those low in CIT. These effects in the literature seem to draw heavily on short-term compliance without acknowledging potential downstream negative effects of touch. Over time, a lack of comfort with interpersonal touch may drive individuals to choose different means through which they wish to communicate. By thinking of interpersonal touch as a method of communication, we might expect that individuals who are lower in comfort with interpersonal touch would be
less likely to put themselves in situations in which touch may occur, and that they will compensate for that loss of face-to-face communication by using other means of communication. Future research could consider investigating how and what types of media individuals consume based on their comfort with interpersonal touch.

CIT may also link theoretically to research that has found that interpersonal touch is related to status. Henley (1973) investigated touching relationships between individuals of different status and found that lower status people are more easily the targets of touch whereas high status individuals exercise touch in order to maintain their status advantage. Stier and Hall (1984) note that perceptions of a person’s dominance increase when a person initiates touch, suggesting that high status individuals want to display their dominance while low status individuals may want to acquire status through touch. In general, older individuals have higher status than younger individuals and this poses an intriguing question of how CIT may change over time. Is it possible to become more comfortable with touch? Perhaps someone who has experienced high mobility in their life (i.e. large status increases or decreases) changes their tactile interactions with others as a result.

In a similar vein, it would also be interesting to investigate large discrepancies between our two dimensions—initiating versus receiving touch. Why is it that an individual would be more comfortable with initiating touch but not receiving it and vice versa. Based on this research, we know that the two dimensions are correlated, but the most interesting people to study may be those for whom there is strong preference for one dimension over the other. Perhaps there are factors that influence an individual to have a large or small discrepancy between these two dimensions. When an individual is polarized on the two dimensions, which one dominates? For example, an individual who is comfortable with initiating touch, an approach orientation, but uncomfortable receiving touch, an avoidance orientation, will need to resolve the tension between these differences. An investigation into these discrepancies would be fruitful.

Not just discrepancies within individuals, but discrepancies across individuals would also be worthwhile to study. Theoretically, it would be interesting to understand how CIT interaction conflicts are resolved, that is, how consumers handle interactions where the differences in CIT are great between the two interactors. These conflicts are bound to influence the way an individual chooses to consume products as well as experiences. How does touching behavior change as a result of similarities or discrepancies in levels of CIT across interactors?

A nuanced analysis of what touch is thought and intended to convey is not a primary focus of this work, but would be very interesting to consider in the future. Touch between people who are not in a close relationship may be perceived to be offensive or produce anxiety (Wilhelm, Kochar, Roth, & Gross, 2001), while others suggest that it is a tool to build stronger relationships and to convey personal closeness (Fuller et al., 2011). Individuals of differing CIT levels may have a tendency to interpret the motivations behind interpersonal touch differently. Perhaps an uncomfortable individual tends to interpret touch as manipulative or coercive, while a comfortable individual might believe most touch conveys warmth or sincerity. These differences in intention and interpretation of its use would contribute to our understanding of why individuals appreciate touch or not. Furthermore, variations on level of CIT might not only influence interpretations of motivations but it also might dictate how and when different types of touch are used, if at all. A handshake, which is largely unobtrusive and formal in nature, would likely be considered comfortable even for the low CIT individuals. Therefore, a typology of the spectrum of touch types based on whether they evoke uncomfortable or comfortable responses from individuals would provide a clearer distinction of the consumer contexts in which high and low CIT individuals differ.

This research on comfort with interpersonal touch focuses primarily on individuals' perceptions and tendencies with respect to their own personal use of touch. Another possible avenue for future research regarding touch is through observation of others’ touch. That is, how does one’s CIT influence how they interpret touch between two other people? Whether in advertisements, consumer-to-salesperson interactions, consumer-to-consumer interactions, physical touch influences how we make inferences and form attitudes about other people as well as brands. Thus, CIT should be useful in empirical tests of theories regarding how messages and communication are interpreted by consumers, not simply through their own physical interactions but through the inferences made by others' interactions as well.

Research on interpersonal touch is not limited to the marketing domain, but has been found to have profound effects in other fields of study as well. For example, in the education domain, interpersonal touch causes children to engage in less disruptive classroom behavior and become more involved in a task (Wheldall, Bevan, & Shortall, 1986); while positive effects are also found in the health field with psychotherapy patients talking longer and about more intimate issues with their therapist after being touched (Jourard & Friedman, 1970). Thus, the positive effects of touch are widespread, but the notion of CIT transverses various contexts and fields and could have many implications outside of marketing.

By and large, there is immense potential for interpersonal touch research in consumer contexts and beyond. Researchers have just begun to illuminate the insights that could be gleaned from interactional studies, and this CIT construct holds much potential to contribute to the development and advance of sensory and interactional consumer experiential research while providing insightful implications for consumers and managers alike.

Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.jcps.2014.07.002.


