Technology product coolness and its implication for brand love

Amit Anand Tiwari [a],[*], Anirban Chakraborty [b], Moutusy Maity [b]

[a] Indian Institute of Management Rohtak, Management City, Southern Bypass, Sunaria, Rohtak, Haryana, 124010, India
[b] Indian Institute of Management Lucknow, IIM Road, Prabandh Nagar, Lucknow, Uttar Pradesh, 226013, India

A B S T R A C T

Increased similarity of features of technology products has led to a waning of unique differentiating factors. In an absence of any tangible unique selling proposition, *coolness* has emerged as one of the compelling differentiators. This study investigates the *coolness* of technology products through in-depth interviews and an application of the critical incident technique (CIT). Thereafter, the findings of the qualitative study are empirically validated by collecting data through survey methodology and analyzing it by using structural equation modeling technique. Six dimensions of *perceived coolness*, viz., *rebelliousness, desirability, innovativeness of technology, reliability, attractiveness,* and *usability* are identified and empirically validated. The impact of *coolness* on brand love (which is a brand-related outcome of coolness), an under-researched construct, is studied and the relationship is found to be positive.

1. Introduction

The variety, volume, and velocity of the proliferation of technology products have increased manifold over the last decade, with products displaying increasing similarity with each other (Ebrahim et al., 2016). The increased resemblance among technology products has led to the waning of unique differentiating factors among them. Convergence of product features creates challenges for both firms and consumers; while firms find it difficult to cut through the clutter, consumers are flooded with myriad options of technology products, where the similarity in functional and technical features of competing products make it difficult to choose one over the other. For instance, standardized offerings of smartphone brands, with minor differences in functional and technical features create problems of differentiation (Petruzzellis, 2010) and selection.

For technology products, *coolness* has emerged as one of the compelling differentiators (Kerner and Pressman, 2007), as it helps consumers in product evaluation (Sundar et al., 2014). So, for technology products, *coolness* has become a crucial element required for the continuous achievement of firms' objectives of product differentiation. It is noted that the products that are perceived as cool, such as iMac, iPod, iPhone, and iPad (Im et al., 2015) have transformed the fortunes of the parent company.

Such success stories demonstrate that consumers treasure the characteristic of coolness in technology products. However, an understanding of the characteristic of *perceived coolness* in the context of technology products is nebulous in extant literature, and the scrutiny of the construct has not advanced much. The following gaps are noticed in

literature:

First, other than some context-specific knowledge (Belk et al., 2010), extant literature remains inadequate (Rahman, 2013) in answering questions like: What are the dimensions of *perceived coolness*? Second, extant literature has measured *coolness* through single item scales (Dar-Nimrod et al., 2012; Warren and Campbell, 2014), which assumes that *coolness* is a unidimensional construct. Third, extant literature has identified only a small and restricted number of dimensions of *perceived coolness* (Warren and Campbell, 2014; Sundar et al., 2014; Bruun et al., 2016; Raptis et al., 2017), which provide limited understanding of the *perceived coolness* construct. Fourth, while the conceptual explanation of *perceived coolness* is addressed in some marketing studies (Rahman, 2013), there are very few empirical studies based on the *perceived coolness* construct (Warren and Campbell, 2014). Fifth, the majority of the studies investigating the *coolness* construct is from the perspective of consumers residing in developed countries in the west (e.g., the UK, the USA). However, the perception of *coolness* may be different across cultures (Gerber and Geiman, 2012), and few studies investigate the construct in the context of emerging economies. Sixth, extant literature offers little research on brand-related consequences of *perceived coolness*. Building on the above-mentioned gaps, this study has two broad objectives: enhancing the conceptual understanding of *perceived coolness*, by identifying a set of possible dimensions of *perceived coolness*, and investigating the relationship between *perceived coolness* and a brand-related outcome, specifically, *brand love*.

This paper contributes to an understanding of the *coolness* construct in the following ways. First, with a comprehensive literature survey, a qualitative exploration and an empirical analysis, this research proposes

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* Corresponding author.
E-mail addresses: amaanand@gmail.com, amitanand@iiml.ac.in (A.A. Tiwari), anirban@iiml.ac.in (A. Chakraborty), mmaity@iiml.ac.in (M. Maity).

and tests six dimensions of *coolness*. Second, from a theoretical perspective, this delineation allows researchers to draw insights regarding product *coolness* dimensions and use these dimensions in future descriptive and causal research. Third, *perceived coolness* (a reflective construct), is empirically validated as a second-order construct. Fourth, from a managerial perspective, our research enhances marketers' understanding of product *coolness* and contributes to the effective designing of cool products. Fifth, the significant relationship between product *coolness* and brand love implies that in order to attain success in the market, companies need to design products that are perceived as cool.

2. Literature review and exploratory study

2.1. Coolness

Different streams of literature such as psychology, sociology (Frank, 1997), anthropology (Dar-Nimrod et al., 2012), and marketing (Belk et al., 2010) have studied *coolness*. Largely, *coolness* has been studied as a characteristic of individuals and objects (Gladwell, 1997). Extant literature on *coolness* has explored its origins (Nancarrow et al., 2002), characteristics, vernacular usage (Rahman, 2013), cultural influences (Frank, 1997), personality aspects (Dar-Nimrod et al., 2012; Kim and Park, 2019), and product dimensions (Bruun et al., 2016).

The concept of contemporary *cool* emerged in the 1950s among the African-American community in the United States of America (Belk, 2006) as a defense mechanism, which was a paradoxical synthesis of submission and rebellion adopted against the prejudice directed at the community (Pountain and Robins, 2000). Further, the association of *coolness* with the hippie culture (Frank, 1997) in the 1960s, and an identification of the construct with anti-commercial and ecology-related movements broadened the appeal of the concept to the larger society. Businesses identified the popularity of the idea of *coolness* and made efforts to embed *coolness* in their marketing activities, leading to wider acceptance of the construct (Belk et al., 2010). Marketing activities centering around *coolness* created links to consumerism (Frank, 1997). Our scrutiny of the literature on *coolness* identifies the following patterns.

First, *coolness* is an abstract concept or an attribute identified by consumers (Belk et al., 2010). Second, it is a subjective evaluation. Consumers with a similar background and interest agree on what is cool and what is not (Leland, 2004). Third, *coolness* is dynamic – it constantly changes with time and dissipates fast (Wooten and Mourey, 2013). Fourth, *coolness* helps in achieving contradictory notions – that is, standing-out and fitting-in (Wooten and Mourey, 2013). Fifth, categorizing a product as cool highlights the positive qualities of the product

(Bird and Tapp, 2008). Sixth, *coolness* is an enviable point of difference, which demonstrates status, affiliation to cool groups (Horton et al., 2012), and possessions (Culén and Gasparini, 2012).

2.2. Dimensions of perceived coolness

Building on McCrickard et al.'s (2012) suggestion of breaking the *coolness* concept into minor entities to understand it, we identify the dimensions of the *perceived coolness* construct and examine each dimension and its contribution toward defining product *coolness*.

Through an extensive literature survey, we uncover five dimensions of *perceived coolness*: *rebelliousness*, *usability*, *innovativeness of technology*, *desirability*, and *attractiveness* (see Table 1). Broadly speaking, extant literature has studied the notion of *coolness* as a personality trait (Southgate, 2003) as well as a product characteristic (Sundar et al., 2014). Table 1 lists prominent studies on product *coolness* and personality *coolness*. We found a few constructs which are related to the dimensions of *perceived coolness*; for example the *usability* dimension is aligned with function cool. Similarly, constructs related to creativity and being hip have definitional overlaps with *innovativeness of technology*. *Rebelliousness* has a few similar concepts in literature, such as originality, autonomy, sub-culture appeal, singular cool, and being antisocial. *Desirability* has similarities with concepts like social status and personal development. In the same vein, being stylish, seeking pleasure, perceiving aesthetic cool, hedonic experience and classical aesthetics are concepts related to *attractiveness*. A column for such constructs is included in Table 1 (header: Similar/overlapping Concepts).

However, before we empirically test the conceptualization of the *coolness* construct as comprising five dimensions only, we undertake an exploratory study in order to confirm that the fundamental dimensions identified in existing literature are indeed exhaustive. Maity and Dass (2014) used a similar methodology to explore consumer decision making across channels.

2.3. Exploratory study

With the use of exploratory research, we gathered preliminary information that helped us diagnose how consumers perceive product *coolness* of high-technology products. We conducted 38 in-depth interviews, in which millennials participated. A millennial reaches young adulthood in the early part of the twenty-first century (Twenge et al., 2012). The interviews were conducted in five shopping malls and three colleges in a north Indian city. The duration of each of the in-depth interviews was 30–45 min. The participants discussed their perception of the dimensions of *coolness*, their experience with cool and/or uncool products, and the reasons for purchasing cool products. We stopped the

Table 1
Coolness literature.

Dimensions of Product Coolness	Definition/Description	Product Cool Literature	Personality Cool Literature	Similar/overlapping Concepts
Usability	Individuals' degree of belief that a product is useable and makes a job easier.	Bruun et al. (2016)	Culén and Gasparini (2012)	**Functional cool** (Noh et al., 2014)
Innovativeness of technology	Tending to innovate, or introduce something new or different; characterized by innovation.	Noh et al. (2014)	Culén and Gasparini (2012); Bird and Tapp (2008); Raptis et al. (2013)	**Creative** (Southgate, 2003); Hip (Pountain and Robins, 2000)
Desirability	Individuals' degree of belief that a product supports individual development and pleasure and the extent to which the individual relates to it	Bruun et al. (2016)	Bird and Tapp (2008); Dar-Nimrod et al. (2018)	**Personal development** (Raptis et al., 2013); **Social Status** (Rodkin et al., 2006)
Rebelliousness	Individuals' degree of belief that a product stands out from the rest.	Bruun et al. (2016); Heath and Potter (2004); Frank (1997)	Raptis et al. (2013); Horton et al. (2012); Dar-Nimrod et al. (2018); Dar-Nimrod et al. (2012)	**Originality** (Sundar et al., 2014; Bird and Tapp, 2008); **Singular cool** (Noh et al., 2014); **Antisocial** (Raptis et al., 2013); **Autonomy** (Warren and Campbell, 2014); **Subcultural appeal** (Sundar et al., 2014)
Attractiveness	Attractiveness is visible aesthetics clubbed with socially acceptable product style.	Sundar et al. (2014)	Belk (2006); Dar-Nimrod et al. (2012); Li et al. (2019); Postigo-Zegarra et al. (2019)	**Stylish** (Bird and Tapp, 2008); **Aesthetic cool** (Noh et al., 2014); **Hedonic quality, Classic aesthetics** (Raptis et al., 2017)

interviews after we detected a saturation of the themes uncovered.

2.3.1. In-depth interviews: analysis and findings

We used the critical incident technique (CIT) to analyze the transcripts of the interviews. Researchers use this technique to identify critical factors that are positive or negative (Dorsey et al., 2016; Flanagan, 1954). The critical factors that impacted the respondents' consumption experiences were identified by analyzing the data using CIT. For the purpose of the study, critical factors are defined as those factors that contribute towards cool/uncool experiences with the products. The critical factors cumulatively shape the respondents' experiences, and such experiences with cool devices can be positive or negative. This is a powerful method to explore salient product attributes (Swan and Rao, 1975).

The transcripts of the 38 in-depth interviews were content analyzed to classify the critical factors as positive or negative experiences. In total, we found 129 critical incidences. Note that often, the same respondent may mention positive as well as negative experiences, each of which is identified as a separate critical incident. Two judges with a significant understanding of consumer behavior literature arranged the positive and negative experiences into eight categories (Table 2). The judges were unaware of the study's objectives. The inter-rater agreement was 83.2%. Thereafter, the judges compared their independent ratings and resolved the disagreements.

Out of the eight critical factors identified through the CIT, we consider *relative advantage* as part of the *innovativeness of technology* construct because literature indicates that *relative advantage* is linked to *innovativeness* (Rogers, 1995). Literature also identifies *innovativeness* as an indicator of *perceived coolness* (Noh et al., 2014). Hence, we retained the category *innovativeness of technology*. The literature considers *rebelliousness* and *subculture appeal* as similar concepts (Raptis et al., 2017). Moreover, *rebelliousness* is an indicator of *perceived coolness* in various studies (Bruun et al., 2016; Dar-Nimrod et al., 2018). Therefore, we retained *rebelliousness*. We retained the other four categories (viz. *usability*, *attractiveness*, *desirability,* and *reliability*) without any modification.

This exercise left us with a set of six constructs (five constructs as reported in Table 1, and *reliability*, which is identified through the exploratory study).

The *coolness* construct has cultural and contextual aspects embedded in it (Gerber and Geiman, 2012). In the Western countries, *coolness* is often linked to *rebelliousness* (Pountain and Robins, 2000; Heath and Potter, 2004). However, a study in Tunisia found that the concept of *coolness* does not include non-conformist ideals (Zouaoui and Smaoui, 2019). In the Tunisian context, people associated *coolness* with lightness, flexibility, fun, amusement, humor, and trendiness. In the United Arab Emirates, people link *coolness* with attributes such as entertaining, sophisticated, and composed (Rahman, 2013). In Taiwan, *coolness* is associated with identification (Chen and Chou, 2019).

Such differences in the understanding of *coolness* can be attributed to cultural, social, and economic contexts (Zouaoui and Smaoui, 2019). Since the understanding of *coolness* has contextual differences, the dimensions of the construct vary across cultures and economies. Therefore, the dimensions of *coolness* are likely to be different in the context of our study, and hence, we conceptualize *coolness* as a reflective construct.

The conceptual model that emerges by integrating the findings of the literature review and the qualitative study are discussed in the subsequent sections.

2.4. Dimensions of perceived coolness

Our proposed model containing the six dimensions of the *perceived coolness* construct, and an outcome viz. brand love, are discussed below (see Fig. 1).

2.4.1. Desirability

A portion of one's self-definition is determined by estimating how others evaluate oneself (Soloman, 1983). Consumers purchase products to influence the social nature of self-definition by conveying a particular self-image (Heath and Scott, 1998). The symbolic interaction theory (Mead, 1934) describes products as social stimuli, which users consume based on the symbols attached to these products by society. The social symbols attached to *coolness* until the 1950s were limited to the idea of a subculture and a rebellious way of life. However, *coolness* is now a socially desirable attribute (Warren and Campbell, 2014), and is considered as a status elevator (Dar-Nimrod et al., 2018), which transfers object-specific desirable characteristics (Dar-Nimrod et al., 2012) to its users. Thus, cool products help consumers negotiate a desirable social identity. The desire to be perceived as a cool person by others leads to the consumption of socially desirable products. Possession of cool products elevates consumers to desirable 'I' status (Belk et al., 2010), and fulfillment of such goals leads to remarkable experiences, which are strongly linked with *coolness* (Warren et al., 2019). Thus, *desirability* is a strong indicator of perceived *coolness* (Raptis et al., 2017).

2.4.2. Innovativeness of technology

Innovativeness of technology is the creative, unique, technical, and functional dimension of a technology product that makes a product differentiable from its competitors (Loiacono et al., 2002). Optimal distinctiveness theory (Brewer et al., 2003) suggests that the need for assimilation and the need for differentiation guides individual behavior. People purchase an innovative, trendy product to fulfill the need for assimilation, that is, to fit in. Innovative products help people distance themselves from dissimilar, unpopular, and unattractive others (Berger and Heath, 2007). Therefore, the need for differentiation conciliate with the consumption of innovative products. Consumers consider innovative, cutting-edge technology products as cool (Read et al., 2012), and also consider an innovative brand and innovative advertisements as cool (Barone and Jewell, 2014). Thus, *innovativeness of technology* is a critical component of perceived coolness.

2.4.3. Attractiveness

Attractiveness is a socially desirable trait (Li et al., 2019) that contributes to attaining coolness (Dar-Nimrod et al., 2018). A very attractive person requires less of the other dimensions of coolness to attain coolness (Dar-Nimrod et al., 2018). Likewise, devices with high *attractiveness* fascinate their users through their external appearances (Goodman et al., 2013), and such devices are perceived as cool (Kim and Park, 2019).

Attractiveness is a combination of visual aesthetics and socially acceptable style (Sundar et al., 2014). Among the two components, the first one - visual aesthetics - has a deep connection with *coolness* (Bruun et al., 2016; Pountain and Robins, 2000). Visually pleasing products appeal to the consumer (Warren et al., 2019). In personality literature too, visual appearance is linked with coolness (Pountain and Robins, 2000). The second component - socially acceptable style - is also linked

Table 2
Critical Incident Technique analysis.

| Dimensions of Coolness	Positive Experience		Negative Experience		Total	
		%		%		%
Usability	11	8.53	4	3.1	15	11.63
Relative Advantage	3	2.33			3	2.33
Innovativeness of Technology	14	10.85	5	3.88	19	14.73
Attractiveness	15	11.63	6	4.65	21	16.28
Rebelliousness	9	6.98	5	3.88	14	10.85
Desirability	19	14.73	7	5.43	26	20.16
Subculture appeal	11	8.53	1	0.78	12	9.3
Reliability	13	10.08	6	4.65	19	14.73
Total	95	73.64	34	26.36	129	100
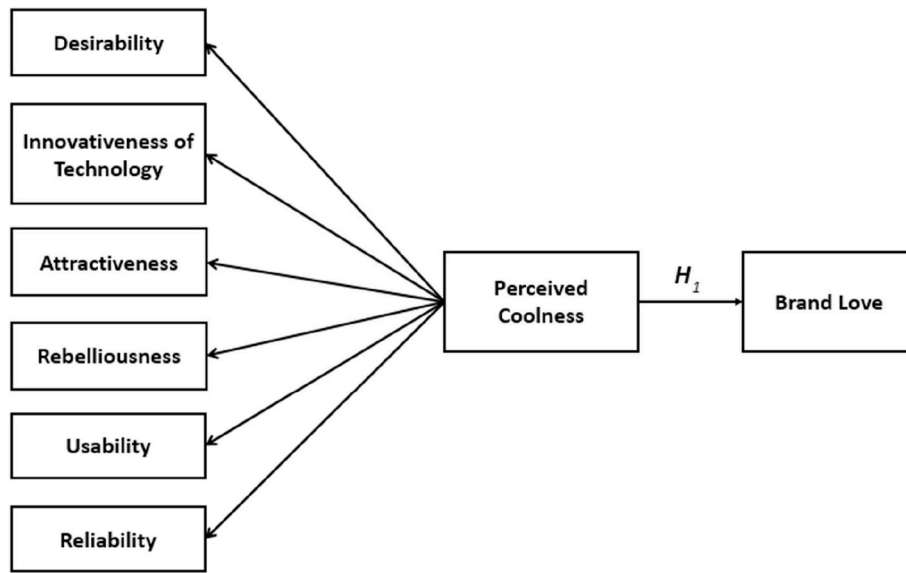
Fig. 1. Conceptual model.

to coolness in personality literature (Pountain and Robins, 2000), and this factor makes consumers feel different from the crowd (Snyder, 1992). Successful companies like Apple and Harley Davidson have consistently integrated both strong visual aesthetics and styling in their products. That is why their products are perceived as attractive (Kim et al., 2015) and cool (Warren and Campbell, 2014). Thus, *attractiveness* is one of the indicators of *perceived coolness* (Sundar et al., 2014).

2.4.4. Rebelliousness

Literature identifies *rebelliousness* as an inherent trait of cool people (Horton et al., 2012), and cool products (Bruun et al., 2016). Cool objects diverge from established norms (Pountain and Robins, 2000). Thus, *coolness* is a kind of *rebelliousness* (Frank, 1997; Heath and Potter, 2004).

Deviance regulation theory (Blanton and Christie, 2003) can be used to explain the link between *rebelliousness* and *coolness*. The theory states that the norms, beliefs, and behavior divergence, which can help people reach their identity goals, tend to appeal to users. However, for it to be perceived as cool, the divergence should not be negative and valueless. Appropriate divergence increases the perception of *coolness* (Warren and Campbell, 2014). Products positioned as cool build on this idea of appropriate divergence. For example, the positioning of Harley Davidson "American by birth, Rebel by choice" conveys the rebel attitude of the brand against middle-class norms (Holt, 2004). The ownership of a Harley Davidson motorcycle bestows the rebellious identity on its owner and makes him/her appear cool. Similarly, consumers perceive the coolest brand, Apple (Cool Brand Council, 2017), as rebellious (Belk and Tumbat, 2005). Thus, rebelliousness is an integral component of coolness.

2.4.5. Usability

Fashion without function is not acceptable to consumers (McCormick and Scorpio, 2000). Levy (2006) argues that *usability* of products is the primary source of their *coolness*. The Cool Brand Council 2017 list of top 10 cool brands, consists of brands including Bose, and PlayStation whose products are consistently rated high on *usability* dimensions too.

Usability helps consumers meet prevention goals, that is, goals that ought to be met in public and personal life, as suggested by regulatory focus theory (Higgins, 1997). The intention to continue the use of technology products is determined by their *usability* (Nascimento et al., 2018). Extant research emphasizes the need for balancing *usability* with *attractiveness* for achieving *coolness* (Sundar et al., 2014). Similarly, coolness literature recognizes functional cool as one of the dimensions of

coolness, and functionality significantly affects *usability* (Noh et al., 2014). Feature-rich, cutting edge technology products are high on usability, and possessions of such products represent the new cool (Culén and Gasparini, 2012; Esch et al., 2019; Read et al., 2012). Thus, *usability* as one of the indicators of perceived coolness (Raptis et al., 2017).

2.4.6. Reliability

In accordance with the outcome of our qualitative study, we add a new dimension – *reliability* – to the conceptualization of the *perceived coolness* construct. *Reliability* is the ability to keep a promise and do the right things (Mittal and Lassar, 1996; Izogo, 2015; Kuo et al., 2009). Parasuraman et al. (1988) identified *reliability* as the dominant dimension of quality. In *coolness* literature, *quality cool* has a positive association with the *perceived coolness* of a product (Runyan et al., 2013). Brands with unreliable quality lose their *coolness* over time. For example, *reliability* issues with the popular Samsung Galaxy S7 model deteriorated Samsung's reputation - the brand's reputation dropped from position seven in the year 2015 to position 49 in the year 2016 (Ismail, 2017).

Analyzing the responses obtained from participants of the in-depth interviews that we conduct (Table 2), we find that *reliability* emerges as one of the top three important dimensions of coolness. One of the respondents mentioned that "though my previous smartphone was trendy, stylish had advanced features, yet it was not dependable. It used to hang a lot, hanging at critical moments like taking group pictures, playing games, watching IPL matches etc., embarrassed me a lot of time in front of my friends." Another person said, "[the] battery of my phone drops from 50-60%–0% in no time … such a premium brand should not cheat customers with cheap-quality products." Another customer noted, "I find this brand [X] phone cool, because along with awesome new features, phone performance is consistent and the best part is private data is secure. I consider it as reliable as my best buddy." Thus, *reliability* is crucial for maintaining the perception of *coolness*.

2.5. Outcome of perceived coolness

In this section, we examine various outcomes of *coolness* that have been documented in extant literature. Literature suggests quality (Shin, 2017), perceived value (Im et al., 2015), attitude (Warren et al., 2019), satisfaction (Liu and Mattila, 2019), intention to use (Kim and Park, 2019), attachment, and loyalty (Chen and Chou, 2019) as consequences of *perceived coolness*. However, the existing literature is silent on the

brand-related consequences of *perceived coolness.* Research finds *brand love* as a reliable means (Huang, 2019; Wallace et al., 2014) of achieving brand loyalty and positive word of mouth (Batra et al., 2012). B*rand love* has emerged as one of the leading notions in consumer-brand relationship literature (Gómez-Suárez et al., 2017; Nikhashemi et al., 2019). Thus, in this study, we investigate the relationship between *perceived coolness* and *brand love.*

2.5.1. Perceived coolness and brand love

The notion of brand love emanates from the literature of interpersonal love in the psychology literature (Batra et al., 2012). Brand love is "a higher-order construct including multiple cognitions, emotions, and behaviors, which consumers organize into a mental prototype" (Batra et al., 2012, p. 2). It signifies the intimate and committed relationship that a consumer has with a brand (Vlachos and Vrechopoulos, 2012), which results in greater praise for the brand (Carroll and Ahuvia, 2006), a readiness to pay a premium price (Albert et al., 2008), an acceptance of product failure (Grisaffe and Nguyen, 2011), and resistance to negative information (Batra et al., 2012).

Products and brands are associated with human-like traits (Aaker, 1997; Carroll and Ahuvia, 2006). *Coolness* is a human trait attributed to products (Pountain and Robins, 2000). Such attribution increases consumers' evaluation of the product (Hart et al., 2013), and creates a positive attitude for the product, which is more likely to be loved (Ahuvia, 2005).

Coolness of a product has self-expressive values such as being rebellious, innovative, desirable, and attractive (Berger and Heath, 2007; Raptis et al., 2017). Cool products help consumers in the self-expression of existing and desired identities, which creates a strong connection between the self and the brand (Escalas and Bettman, 2003). *Brand love,* a consumer-brand relationship construct, is linked to current and desired expressions of self-identity (Batra et al., 2012). Since the possession of cool products helps consumers express themselves better, and enact the desired self-identities (Sundar et al., 2014), love tends to be higher for such products that facilitate the fulfillment of symbolic goals (Carroll and Ahuvia, 2006). Along with the fulfillment of self-expression needs, social belongingness needs fulfillment also has strong relationships with *brand love* (Bergkvist and Bech-Larsen, 2010). *Cool* products help a person meet her/his social needs by creating a sense of community (Bird and Tapp, 2008). The contentment obtained in the fulfillment of social needs augments bonding between the cool product and its user, creates an emotional attachment, and forms a strong long-term relationship (Rahman, 2013). Such bonding leads to the integration of the brand in the consumer's self-identity (Reimann et al., 2012). Self-brand integration leads to brand love (Batra et al., 2012).

The perceived quality of a product is related to brand love (Carroll and Ahuvia, 2006; Batra et al., 2012). In the absence of great product qualities, it is difficult to generate brand love (Batra et al., 2012). Among the dimensions of coolness, reliability emanates from service-quality literature and is a strong determinant of perceived quality (Parasuraman et al., 1988). Thus, great product reliability should be linked to brand love. Further, utilitarian values like usability of a product is also strongly linked to brand love (Sarkar, 2014). Based on the discussion above, we hypothesize that:

H1. Perceived coolness has a positive impact on brand love.

3. Methodology

In this section, we present the empirical tests undertaken for testing the proposed model presented in Fig. 1.

3.1. Items included in the study

We selected smartphone as the context of our study because it is a product that is used both publicly and privately. Also, the smartphone

user base surpassed 3 billion in the year 2018, achieving a penetration rate of 55% across the world (Meena, 2017).

We selected our participants from the millennial population, as they have emerged as a very important demographic segment for marketers (Purani et al., 2019). The millennial population segment is among the largest smartphone users (Nielsen, 2014). This group of users is known as heavy users of high-technology products.

3.2. Pretest

We conducted a pretest to test the reliability of the scales used for measuring the various dimensions of the *perceived coolness* construct. The pilot study sample consisted of 104 respondents, who were students and executive-course participants in a large business school in northern India. Seven-point Likert scales anchored at 1 = "strongly disagree" and 7 = " strongly agree" were used for all items.

We analyzed the responses using principal component factor analysis with varimax rotation. During factor loading check, scale items less than 0.50 were eliminated (Hair et al., 1998). This exercise left us with 23 items. The factor matrix shows six factors. Therefore, six factors, that is, *attractiveness, rebelliousness, reliability, desirability,* and *usability* (measured with four items each), and *innovativeness of technology* (measured with three items), are included in the main study. The refined scale items used in the main study are reported in Table 3.

3.3. The main study: questionnaire and data collection

The refined questionnaire was used for conducting an online survey, which serves as our main study (Table 3). The items measuring the construct *brand love* are included in the questionnaire, which is also measured through a 7-point Likert scale. Smartphone users are targeted on the social media networking website, Facebook, through Facebook Ads (Facebook's online advertisement platform). Facebook is a great platform for reaching a large population through a random exposure to an advertisement containing the questionnaire link for the target population (Thomson and Ito, 2014). Our ad on Facebook had both text and image in the advertisement, through which we requested participation in the survey: the text "Smartphone *coolness* survey" was displayed with an embedded link to the survey questionnaire. The advertisement ran for two months from March/2018 to April/2018. We monitored the IP addresses of the respondents to avoid multiple responses from the same respondent. A total of 1829 people clicked on the advertisement, of which 447 filled the questionnaire, with a response rate of 24.45, which is acceptable (Dillman, 2000). After removing half-filled responses, we are left with 399 useable responses.

4. Analysis

4.1. Sample characteristics

Respondents' ages ranged from 18 to 35 years, and 28.07% were females. The user base of Facebook consists of 26% female users in India (Arora, 2016). The percentage of female representation in our sample is representative of the user population of Facebook in India, thus lending credibility to our data collection process. 52.13% of respondents belong to the 18–25 year age group. 55.39% of respondents have completed their undergraduate degrees, and 37.34% have completed graduate-level studies.

4.2. Common method variance (CMV)

Common method variance (CMV) may be a potential concern in our study. Hence, we took several measures to minimize and control its effect on the results. We adopted the procedures recommended by Podsakoff et al. (2003) to minimize CMV. First, the anonymity of the respondents is protected. Second, we use items from extant literature to

Table 3
CFA results.

Constructs	Scale	Indicator	Mean (S. D.)	Factor Loading	CR	AVE
					0.92	0.74
Attractiveness (Bruun et al., 2016)	Unattractive-Attractive	Attr1	3.81 (1.77)	0.87		
	Ugly – Beautiful	Attr2	3.79 (1.70)	0.90		
	Plain -Eye-catching	Attr3	3.99 (1.6)	0.82		
	Unimaginative- Creative	Attr4	3.53 (1.9)	0.85		
					0.89	**0.68**
Rebelliousness (Sundar et al., 2014; Bruun et al., 2016)	My smartphone moves against the current norms	Reb 1	3.76 (1.66)	0.79		
	My smartphone is different	Reb 2	3.95 (1.67)	0.85		
	My smartphone is outside the ordinary	Reb 3	3.83 (1.69)	0.82		
	My smartphone stands apart from similar devices	Reb 4	3.92 (1.77)	0.84		
					0.92	**0.75**
Desirability (Raptis et al., 2017)	My smartphone can make me look good	Des1	4.58 (1.95)	0.87		
	My smartphone can make me look in control of things	Des2	4.63 (1.77)	0.93		
	My smartphone can make me better	Des3	4.44 (1.70)	0.81		
	My smartphone can make me happy	Des4	4.77 (1.91)	0.85		
					0.90	**0.71**
Usability (Raptis et al., 2017)	My smartphone is simple to use	Usa 1	5.17 (1.63)	0.81		
	My smartphone is easy to operate	Usa 2	4.96 (1.54)	0.87		
	My smartphone is easy to learn	Usa 3	5.10 (1.64)	0.86		
	My Smartphone is easy to use	Usa 4	4.93 (1.39)	0.83		
					0.87	**0.69**
Innovativeness of Technology (Lee et al., 2011)	How different are functions of your smartphone from others you know about?	IoT1	3.83 (1.82)	0.79		
	How innovative do you think functions of your smartphone are?	IoT2	4.10 (1.69)	0.87		
	To what extent the innovation in your smartphone changed the way you use it	IoT3	3.97 (1.84)	0.84		
					0.92	**0.74**
Reliability (Mittal and Lassar, 1996; Kuo et al., 2009)	My smartphone provides the service as promised	Rel 1	4.74 (1.76)	0.93		
	My smartphone performs tasks right every time	Rel 2	4.71 (1.75)	0.83		
	My smartphone rarely hangs/stops working	Rel 3	4.73 (1.76)	0.91		
	My smartphone is dependable in handling.	Rel 4	4.52 (1.97)	0.77		
					0.93	**0.72**
Brand Love (Carroll and Ahuvia, 2006; Vlachos et al., 2010)	My smartphone brand is a wonderful brand	BLO1	4.55 (1.59)	0.83		
	I have no particular feelings about my smartphone brand	- BLO2	4.52 (1.80)	0.89		
	My smartphone brand is a pure delight	BLO3	4.47 (1.58)	0.90		
	My smartphone brand makes me very happy	BLO4	4.59 (1.76)	0.84		
	I am passionate about my smartphone brand	BLO5	4.48 (1.55)	0.80		

avoid item ambiguity. Third, we randomized the order of questions in the questionnaire. We checked CMV using the Common Latent Factor (CLF) method, which instructs to compare the model's standardized regression weights with CLF to the standardized regression weights without CLF (Lowry et al., 2012). We find that CMV is not a problem in our study.

4.3. Confirmatory factor analysis (CFA)

We undertake confirmatory factor analysis (CFA) through AMOS-based structural equation modeling to assess the unidimensionality of the constructs used in our study. We report the results of CFA in Table 3, which presents the unidimensionality, convergent validity, and reliability of the six dimensions of *perceived coolness*. Standardized parameter estimates, composite reliability (CR), and average variance expected (AVE) are reported. All items load on their respective dimensions significantly, and the loadings are between 0.77 and 0.93. The CRs, an internal consistency reliability measure, range from 0.89 to 0.93. The AVEs range between 0.68 and 0.74, which is more than the accepted range of 0.50, signifying convergent validity for each latent

construct (Fornell and Larcker, 1981).

Discriminant validity is satisfactory because the squared correlation between the two factors is lower than the AVE for each dimension (Fornell and Larcker, 1981) (Table 4).

4.4. Measurement model

For the measurement model, the overall fit statistics are as follow: $\chi^2 = 612.28$ (df = 343); Tucker–Lewis Index (TLI), Normed Fit Index (NFI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI) are 0.97, 0.93, 0.97, and 0.97 respectively; Root Mean Square Error of Approximation (RMSEA) is 0.04. All these indices indicate a good fit for the model (Hu and Bentler, 1999).

The six dimensions of *rebelliousness, usability, reliability, desirability, attractiveness,* and *innovativeness of technology* display loadings of 0.70, 0.71, 0.84, 0.66, 0.59, and 0.57, respectively, on *perceived coolness.* According to Hair et al. (1998), loading estimates should be higher than 0.5. The CR and AVE of *perceived coolness* construct are 0.88 and 0.51, respectively, signifying convergent validity (Fornell and Larcker, 1981).

All the dimensions of *perceived coolness* load significantly on the central construct, as hypothesized (Table 5a).

4.5. Structural model

For the structural model, the overall fit statistics are as follow: $\chi^2 = 612.28$ (df = 343); TLI, NFI, CFI, and IFI are 0.97, 0.93, 0.97, and 0.97 respectively; RMSEA is 0.04. All these indices indicate a good fit for the model (Hu and Bentler, 1999) (Table 5b). The results of the structural model also provide support for H_1. The relationship between *perceived coolness* and *brand love* is positive and significant ($\beta = 0.88$, p value = .001 $R^2 = 0.78$) (Table 5b).

5. Discussion

In the extant literature, *perceived coolness* is conceptualized as a second-order construct (Sundar et al., 2014; Raptis et al., 2017). However, no comprehensive research thus far provides researchers with a clear understanding of the dimensions of *perceived coolness.* In this research, we identify the dimensions of *perceived coolness.* Among all the dimensions of *perceived coolness, reliability* is found to have the highest impact on brand love. Since the *coolness* construct is culturally laden, its understanding is likely to change from one culture to another (Gerber and Geiman, 2012). In emerging markets, due to lack of regulation, compliance, and enforcement, there is a huge supply of duplicated, imitated and fake products (Sheth, 2011), which is a possible reason why the *reliability* of technology products is one of the main concerns in the Indian market. Besides, India has a collectivistic culture (Lindridge, 2005); in such a setting, *reliability* is always emphasized as being an important factor influencing choice/evaluation of product (Earley and Gibson, 1998). These reasons provide possible explanations for why *reliability* has emerged as the strongest determinant of *perceived coolness* in our study. *Rebelliousness* emerged as the second most important factor of *perceived coolness.* Looking back to the initial conceptualization of *coolness,* it was related to counter-culturism, anti-conformism (Pountain and Robins, 2000), which is in line with our results that *rebelliousness* is a

Table 5a
R² and beta path weight coefficients, model fit.

Dimensions	2nd order construct	Coolness ModelBeta Weights (Measurement Model)	Coolness Model(R²) Beta Weights (Structural Model)
Desirability	Perceived Coolness	.66***	42.25% .65***
Innovativeness of Technology	Perceived Coolness	.57***	33.64% .59***
Attractiveness	Perceived Coolness	.59***	37.21% 0.61***
Rebelliousness	Perceived Coolness	.70***	49.00% .70***
Usability	Perceived Coolness	.71***	47.61% .69***
Reliability	Perceived Coolness	.84**	72.25% .85***

Table 5b
Results of hypothesis H1, and Model Fit.

Hypothesis: Brand Love: R² = 78%, Beta Weight = 0.88***, H1 = (Perceived Coolness - > Brand Love) Supported

Model Fit Indices: χ2/df = 1.79, IFI = 0.97, NFI = 0.93, CFI = 0.97, TLI = 0.97, RMSEA = 0.04

critical component of *coolness. Usability* has emerged as the third essential dimension of *perceived coolness.* This finding is in consonance with previous literature (Sundar et al., 2014; Raptis et al., 2017). The *desirability* dimension of *perceived coolness* underscores the importance of symbolic currency of cool products, which is again in line with previous literature (Bruun et al., 2016). We note that the *attractiveness* dimension, which includes both aesthetics and style, has been investigated sparingly in the literature (Sundar et al., 2014). This study confirms the significance of *attractiveness* in the *perceived coolness* of the products. Finally, *innovativeness of technology,* which was adopted from the innovativeness dimension of *coolness* to suit our technology context, is found to be an important indicator of *perceived coolness.* Therefore this research adds to the *coolness* literature by exploring innovativeness constructs in technological context. In addition to six dimensions of *coolness,* a strong positive linkage is found between *perceived coolness* and *brand love.* To the best of our knowledge, this study is the first empirical demonstration of a relationship between *perceived coolness* and *brand love. Perceived coolness* explains 78 per cent of *brand love* variance and emerges as a very strong predictor of *brand love.* This finding further strengthens the role of the *perceived coolness* construct in the context of technology products.

5.1. Theoretical contribution

Our study makes several theoretical contributions. First, consumer behavior research on *perceived coolness* in extant literature is uncertain regarding a robust understanding of the construct (Warren and Campbell, 2014, Warren et al., 2019). This study provides an empirical validation of the *perceived coolness* construct as a second-order one by identifying specific dimensions, that is, *desirability, innovativeness of technology, rebelliousness, usability, attractiveness* and *reliability.* Together

Table 4
Discriminant validity.

	1	2	3	4	5	6	7
1. Usability	**0.843**						
2. Attractiveness	0.290	**0.834**					
3. Rebelliousness	0.430	0.530	**0.825**				
4. Innovativeness of Technology	0.560	0.350	0.400	**0.866**			
5. Desirability	0.690	0.470	0.560	0.550	**0.862**		
6. Reliability	0.270	0.450	0.590	0.390	0.460	**0.860**	
7. Brand Love	0.580	0.530	0.600	0.560	0.760	0.570	**0.853**

six dimensions identified in the study provide ready measures for future researches.

Second, limited studies have investigated *perceived coolness* in the context of non-Western countries (Rahman and Laud, 2016; Zouaoui and Smaoui, 2019). We add to the *coolness* literature by investigating *coolness* in emerging economies. Third, no prior research has highlighted the criticality of the r*eliability* dimension in the context of the *perceived coolness* of technology products. Our findings indicate that reliability is a dimension of *coolness* (in the context of an emerging economy), which is in contrast to the understanding of *coolness* in the context of western countries. We consider this finding as providing further evidence that *coolness* is a cultural phenomenon. Fourth, literature underscores the importance of utilitarian attributes in contemporary cool technology products (Sundar et al., 2014). Our study establishes and highlights the importance of *usability* for cool technology product. Further, our study establishes *innovativeness of technology* as one of the vital determinants of *perceived coolness*. *Innovativeness of technology* is one of the indicators of performance (Lee et al., 2011). Both performance and *usability* are linked to the utilitarian aspect of the product. Thus, this study establishes the criticality of the utilitarian dimension in the *perceived coolness* construct.

Finally, extant literature on *coolness* offers limited insight on the consequences of this focal construct; particularly, the consequences of *perceived coolness* on brands have received little attention in literature. This study bridges this gap by investigating the implication of *perceived coolness* on *brand love*. In doing so, this research contributes to the understanding of antecedents of *brand love*, a research area that currently offers limited insights (Fetscherin, 2014). Further, this research is one of the earliest studies that investigates the consequences of *perceived coolness* on brands and thereby contributes significantly to addressing a major gap in the marketing literature. This study also extends the theoretical premise of the consumer-brand relationship by finding support for a strong link between *perceived coolness* and *brand love*, which requires a strong consumer-brand relation.

5.2. Managerial contribution

A key problem for marketers and those in product development, is understanding, why are some products perceived to be cool? How can we design cool products? This problem increases due to the short-lived nature of the *coolness* phenomenon, and it makes the work of designers complex and challenging. Trying to come up with cool products is risky as well as a costly affair. The existing approach is coolhunting, that is, employing experts to identify upcoming cool trends (Southgate, 2003), where marketers identify *coolness* through coolhunters. Coolhunting is often costly, as well as context-specific. Thus, generalizing *coolness* to a larger population is a risky affair from a commercial standpoint. Therefore, marketers need frameworks to understand *coolness* proactively. Also, creating new types of cool will be more profitable in comparison to copying and making incremental changes in existing cool products.

Our study offers a framework for understanding the granularity of *perceived coolness*. This framework is expected to help marketers evaluate existing products' *coolness* as well as upcoming products' *coolness*. Such evaluation is likely to help marketers recognize the dimension(s) of *perceived coolness* that they need to improve upon. Marketers can also evaluate competitors' product *coolness* through our framework, which is likely to help marketers design cool and differentiable products.

Further, our framework can supplement the coolhunting approach, which is likely to make the design process of cool products more efficient. The coolhunting approach will provide the required information for upcoming trends, and our framework will help marketers to identify categories and evaluate those trends. It will make designing cool products more effective and proactive.

Based on our findings, marketers can enhance the stages of product development. From the generation of *cool* ideas, development of *cool* prototypes to the commercialization of *cool* products. During the idea generation stage, managers can use our framework to screen all ideas for *coolness*. It will help firms to kill ideas of uncool products at the initial stage. During concept testing, our framework may help evaluate a firm and its competitors' products on *perceived coolness*. Also, various combinations of cool product offerings may be created based on the *perceived coolness* framework. During the market-testing phase, *perceived coolness* dimensions are likely to help firms to understand the consumer's perception of product *coolness*. Based on market-testing, firms can refine the product before the commercialization stage.

Finally, the strong link between *perceived coolness* and *brand love* provides a solid impetus for firms to produce cool products and to build cool images around these products. With the emergence of handheld devices and applications such as price comparison apps, social media apps, and consumer forums, firms are finding it difficult to retain customer loyalty. Using the *perceived coolness* framework, firms can design differentiable cool products effectively, which will attract brand love from customers. *Coolness* emerges as a very potent tool for developing a strong love-like relationship with customers. Therefore, along with designing cool products, mangers should also develop various communication strategies to create cool images of products. In such communication strategies, emphasizing the self-expressive role of cool products is likely to enhance self-brand congruence, which is a way of reinforcing the perception of coolness in the consumer's mind. While designing communication strategies, managers can create new or use existing cool stimuli. Further, managers may engage cool people/celebrities as brand ambassadors, which is a well-established means for imparting coolness to products. Overall, the results of the present study should encourage managers to design cool products and build cool images around them to induce love for their brands.

5.3. Limitations and suggestions for future research

While many of our findings are novel, our study has several limitations. First, our examination of product *coolness* focuses on the millennial population only. Future studies should explore *perceived coolness* among the adolescent population and other demographic segments too. Second, among brand consequences, we focus on *brand love* only. Since *coolness* is a token to premium pricing and windfall profits, its relationship with brand loyalty, brand equity, and brand experience need further exploration. Third, our study focuses on a specific technology product only. Future studies may test the framework in the context of other product categories. We hope that our study will prompt more investigations in the context of *perceived coolness*.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jretconser.2020.102258.

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