Competing through manufacturing: countering a product's liability of foreignness through mass customization

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Abstract

Purpose – The operational capability of mass customization (MC) allows consumers to obtain products tailored to their idiosyncratic needs. This study aims to provide insights into the potential of this capability for countering a product's liability of foreignness – the negative effect of the out-group status of a product's country of origin (COO) on consumers' evaluations of the product.

Design/methodology/approach – Based on the social identity approach, it is hypothesized that this liability is reduced when a consumer product is mass-customized rather than standardized as per a mass-production strategy. This hypothesis is tested using a mixed between- and within-subject experiment.

Findings – When evaluating mass-produced sneakers, native German-speaking (Italian-speaking) South Tyrolean consumers rated the quality of Italian (German) sneakers significantly lower than that of German (Italian) sneakers. However, when the sneakers were mass-customized, this difference in perceived product quality was non-significant for both groups of consumers, supporting the research hypothesis.

Research limitations/implications – Future research could replicate this study in other samples, with other product types, COOs and countries of destination, as well as at different degrees of product customization.

Practical implications – Business-to-consumer firms contemplating the development of their MC capability are made aware that the benefits of this operational capability might go beyond the typical advantages highlighted by the existing literature.

Originality/value – This paper joins the discussion on MC value by offering a theoretical explanation and empirical support for another mechanism through which the operational capability of MC can create value, at least in business-to-consumer industries: by countering a product's possible liability of foreignness and thus increasing perceived product quality in export markets.

Keywords Mass customization, Manufacturing/operations strategy, Country-of-origin effect, Social identity approach, Experimental study

Paper type Research paper

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1. Introduction

Mass customization (MC) denotes the operational capability to provide customized products/services that fulfill each customer's idiosyncratic needs without substantial tradeoffs in cost, delivery and quality performance (e.g. Pine, 1993; Squire *et al.*, 2006; Kortmann *et al.*, 2014). Almost two decades ago, Lowson (2002) indicated MC as one of the major landmarks of modern operations and, indeed, "MC has evolved from being a niche competitive approach to becoming a widely adopted strategy" (da Silveira *et al.*, 2016, p. 1). Industry 4.0 technologies promise to sustain this trend (Eyers *et al.*, 2018; Koh *et al.*, 2019). For example, digitalization creates the conditions for the empowerment of shop floor workers (Leyer *et al.*, 2019) – an enabler, at least in many contexts, of MC (Sandrin *et al.*, 2018) – and big data analytics provide opportunities for better mass personalization (Kache and Seuring, 2017). Reflecting its growing importance for the business community, MC has received increasing attention in academia (da Silveira *et al.*, 2001; Fogliatto *et al.*, 2012).

In particular, the strategic issue of what drives the value of MC has attracted growing interest (Fogliatto *et al.*, 2012). The earliest studies emphasized two value creation mechanisms. The first is the reduction of the monetary and non-monetary costs borne by customers to obtain a customized product (Merle *et al.*, 2010). This reduction derives from the mitigation of the negative effects of product customization on cost, delivery and quality performance (Merle *et al.*, 2010) by virtue of technological and organizational solutions, such as product modularity and cross-functional coordination (e.g. Zhang *et al.*, 2014). The second mechanism is the increase in the utilitarian benefit accruing to customers from the possession of the product (Piller *et al.*, 2004; Merle *et al.*, 2010). This increment stems from the closer fit between each customer's idiosyncratic preferences and the objective, functional or aesthetic features of the mass-customized product (Merle *et al.*, 2010; Fogliatto *et al.*, 2012; Sandrin *et al.*, 2017). More recently, the literature has highlighted other possible sources of MC value, at least in business-to-consumer (B2C) industries, such as the product's symbolic qualities of uniqueness and self-expressiveness – instead of its objective characteristics – and the positive emotions of enjoyment and pride experienced by customers when customizing a product – rather than the possession of the product itself (Merle *et al.*, 2010; Fogliatto *et al.*, 2012; Trentin *et al.*, 2014; Sandrin *et al.*, 2017). In summary, by progressively including additional sources of MC value, this line of inquiry has strengthened over time. Indeed, in their most recent review of the MC literature, Fogliatto *et al.* (2012) indicated that this is a promising area for further research.

The present study extends this stream of research by offering a theoretical explanation and empirical support for another mechanism by which MC can create value: by countering a product's possible liability of foreignness. When entering foreign markets, companies "may face an intangible barrier in the form of consumer bias on the basis of product origin" (Schooler, 1971, p. 71). For example, the tendency of consumers to favor domestic products has often been noted (Lantz and Loeb, 1996). Furthermore, in situations where domestic alternatives are not available, a positive bias toward products that originate in culturally similar countries has been found (Wang and Lamb, 1983; Watson and Wright, 2000). A common explanation for these findings is based on the notion of in-group favoritism (Lantz and Loeb, 1996; Watson and Wright, 2000), defined in the social identity approach (cf. Hornsey, 2008) as "the tendency to favor the in-group over the out-group in evaluations and behavior" (Tajfel and Turner, 1986, p. 13). The negative effect of the out-group *status* of a product's country of origin (COO) on customers' evaluations of the product itself is what we concisely refer to here as a product's liability of foreignness. The present study is the first to investigate, both theoretically and empirically, the potential of the operational capability of MC for countering this liability.

More specifically, the paper draws upon the social identity approach to develop the hypothesis that the product quality difference consumers perceive, under certain conditions, between a product originating in an in-group country and the same product coming from an out-group country is reduced when the product is mass-customized rather than mass-produced.

To test this hypothesis, a mixed between- and within-subject experiment was designed, which involved two different COOs – Germany *vs* Italy – for the same tangible product stimuli – either mass-customized or mass-produced sneakers – and 162, either native German-speaking or native Italian-speaking, South Tyrolean (ST) consumers. The results of the experiment showed that, when evaluating mass-produced sneakers, native German-speaking (Italian-speaking) STs rated the quality of German (Italian) sneakers significantly higher than that of Italian (German) sneakers, consistent with the notion of in-group bias. When sneakers were mass-customized, however, this difference in perceived product quality became non-significant for both groups of consumers, supporting the hypothesized bias-mitigation effect of MC.

This finding highlights another possible source of MC value: the mitigation of a product's possible liability of foreignness and the consequent increase in perceived product quality in export markets. This improves the understanding of how the operational capability of MC can support a firm's strategy of sales internationalization, which ultimately contributes to outlining – for this operational capability – an increasingly mature, "externally supportive" (Wheelwright and Hayes, 1985, p. 100) role in formulating and achieving an organization's strategic goals. Seen through the lens of the COO literature, the results of this study enrich the long-lasting discussion on the moderators of the COO effect. Pragmatically, this research speaks to B2C firms facing the challenge of persuading foreign customers to trust their products when similar goods are made by local competitors (cf. Brooks, 2019).

2. Theoretical background and research hypothesis

2.1 Perceived product quality, country-of-origin effect and a product's liability of foreignness

"Ever since the scientific management of quality became a field of expertise in the early 20th century, the definition of the word *quality* has appeared to be problematic" (Giroux, 2006, p. 1239). Conceptual ambiguity about quality and different approaches to defining this term have been repeatedly noted in the literature (e.g. Garvin, 1984; Reeves and Bednar, 1994; Golder *et al.*, 2012). However, many scholars have convincingly argued that research should not aim at a single definition of quality; rather, different definitional perspectives must be consciously cultivated because each focuses on different dimensions of quality and is thus appropriate under different circumstances (Garvin, 1984; Reeves and Bednar, 1994; Sousa and Voss, 2002). Particularly, if the aim is to understand consumer behavior, then what is important – even for perfectly objective dimensions of quality, such as conformance to specifications – is the quality perceived by consumers (Stone-Romero *et al.*, 1997). Predictably, customers' perceptions of product quality have been a paramount concern in the marketing literature (Golder *et al.*, 2012), but their importance has also long been recognized in the field of operations management (OM) (e.g. Garvin, 1984). Stone-Romero *et al.* (1997) provide an extensive review of measures of perceived product quality.

From an information theoretic perspective, a product can be conceived as an array of information cues, which provide a basis for customers to develop various impressions of the product, including perceived product quality (Olson and Jacoby, 1972). Traditionally, a distinction has been made in the literature between intrinsic cues, which cannot be modified without also changing the physical characteristics of the product (e.g. rug fiber type), and extrinsic cues, which are product related but are not part of the physical product (e.g. rug price and warranty) (Olson and Jacoby, 1972; Bloemer *et al.*, 2009). A product's COO is another example of an extrinsic cue, and the conscious or unconscious incorporation of this cue in the formation of customers' evaluations of the product is commonly referred to as the COO effect (Bloemer *et al.*, 2009).

Traditionally, three types of mechanisms have been invoked to explain the COO effect: cognitive, affective and normative (Brijs *et al.*, 2011). Cognitive mechanisms can take different forms, but in each customers, either deliberately or automatically (Herz and Diamantopoulos,

2013), use the COO cue to learn about the quality of a product (Brijs *et al.*, 2011). One possibility is to use this cue as a "halo" to infer the unknown levels of intrinsic attributes of foreign products with which customers are not familiar (e.g. Han, 1989; Laroche *et al.*, 2005). For instance, novice American consumers could rate the reliability of consumer electronics "Made in Japan" very high based on strong stereotypes of the country in which the products originate. Meanwhile, experienced American consumers could use the same COO cue as a "summary construct" to represent, in their memory, the knowledge they have previously acquired about the actual quality of various consumer electronic products "Made in Japan" and to readily retrieve such knowledge when evaluating other products of the same category from the same country (e.g. Han, 1989; Laroche *et al.*, 2005). It is important to note that consumers have perceptions about how typical a certain product is of a given country (Spielmann, 2016) and evaluate products perceived as typical of a given country more favorably than atypical products with the same origin (Tseng and Balabanis, 2011). For example, although Japan has a generally positive image in Taiwan, Japanese refrigerators are perceived by Taiwanese consumers as more typical of Japan than Japanese teapots, thus enjoying more favorable evaluations (Tseng and Balabanis, 2011).

Besides cognitive processes, the COO cue can also trigger affective processes, evoking positive or negative feelings that influence product evaluation (Brijs *et al.*, 2011; Laroche *et al.*, 2005). An individual may have strong emotional connotations about a country for many different reasons, such as holidays spent there or the country's history and art (Verlegh and Steenkamp, 1999).

Finally, the COO cue can affect product evaluation through a normative mechanism involving a customer's inner norms and values (Brijs *et al.*, 2011). For instance, an American consumer whose experience suggests that German cars are durable might cognitively infer that an Audi is a durable car because it originates in Germany and have no emotional response to Germany as a COO. However, the consumer's personal motive to maintain a positive self-concept, as explained in the next section, might constitute a liability for a foreign car, including an Audi, and this normative mechanism could lead the consumer to favor a car from his or her home country.

2.2 Social identity approach and a product's liability of foreignness

The social identity approach, comprising Tajfel's (1978) social identity theory and Turner *et al.*'s (1987) self-categorization theory, is a highly influential, theoretical explanation of intergroup relations and group processes (Hornsey, 2008). One central tenet of this approach is the existence of different levels of self-definition that are important to an individual's self-concept (Hornsey, 2008). At the level of personal identity lie those "characteristics and behaviors (e.g. intelligent, hardworking) that differentiate one from others" (Reid and Daux, 1996, p. 1084). Personal identity is based on interpersonal comparisons (Hornsey, 2008) and does not depend on group membership (Gaertner *et al.*, 2002). Yet, when the distinction between certain social categories becomes salient (e.g. when two males confront two females in debating an issue, as opposed to two males or two females confronting each other (Hogg and Turner, 1987)), another level of self-definition gets activated: the level of social identity (Hornsey, 2008). At this level lie those aspects of an individual's self-concept that derive from the social category, or categories, to which he or she perceives belonging (Tajfel and Turner, 1986). The individual's social identity describes what it is to be a category member and prescribes what kinds of attitudes, emotions and behaviors are appropriate in a certain context (Hornsey, 2008).

Another basic tenet of the social identity approach is the existence of a "functional antagonism" between different levels of self-definition, meaning that when one level becomes more salient, another level becomes less so (Hornsey, 2008, p. 208). For instance, when a certain social identity is activated, the individual comes to see himself or herself less as a

unique personality, defined by individual differences, and more as an interchangeable exemplar of the social category of affiliation (Hornsey, 2008). This process of depersonalization is also referred to in the literature as "self-stereotyping" (Simon and Hamilton, 1994; Lantz and Loeb, 1998). The individual tends to think of himself or herself as having characteristics that are representative of the social category to which he or she perceives belonging (Brewer and Gardner, 1996). For example, the participants in Hogg and Turner's (1987) study characterized themselves as more typical of their gender when distinctions between males and females were made salient – i.e. when discussion took place between two men and two women – than when two people of the same gender confronted each other (Brewer and Gardner, 1996). In summary, the mere process of making "us *vs* them" distinctions salient changes the way people see themselves (Hornsey, 2008).

From the distinction between group- and individual-based aspects of the self and from the assumption that individuals are motivated to have a positive self-concept, the social identity approach derives the prediction that people will strive to achieve, or to maintain, a positive social identity (Tajfel and Turner, 1986). People accomplish this goal by means of "favorable comparisons that can be made between the in-group and some relevant out-groups: the in-group must be perceived as positively differentiated or distinct from the relevant out-groups" (Tajfel and Turner, 1986, p. 16). This motive for positive distinctiveness may lead to in-group bias (Turner and Reynolds, 2012), defined as "the tendency to favor the in-group over the out-group in evaluations and behavior" (Tajfel and Turner, 1986, p. 13).

However, in-group favoritism is not an automatic and inevitable outcome of the process of social self-categorization (Turner and Reynolds, 2012). For instance, where *status* differences between two social groups are perceived by both groups as legitimate and/or stable, it is possible that neither "the inferior" nor the "superior" groups will show a tendency to favor the in-group over the out-group (Tajfel and Turner, 1986). Particularly, the subordinate group might internalize a widely accepted evaluation of itself as "inferior" and hence derogate itself and display a positive attitude toward the dominant out-group (Taifel and Turner, 1986). Conversely, in-group bias is expected to prevail when the subordinate group is able to be critical of, and see alternatives to, the *status quo* of intergroup relations (Tajfel and Turner, 1986; Hornsey, 2008).

From the above, it can be inferred that, when consumers confront two products of the same kind that originate in two different countries, one of which is either their motherland or a country culturally more similar to their motherland than the other, the COO cue primes the consumers' self-categorization according to the criterion of cultural affiliation. In turn, the activation of this social identity may lead the consumers to favor the product originating in the in-group country over the one coming from the out-group country.

2.3 Operations strategy, mass customization and a product's liability of foreignness

Since Skinner's (1969) pioneering work on the strategic role of the manufacturing function, the literature on operations strategy has grown substantially, and it has been repeatedly reviewed over the past four decades (e.g. Anderson *et al.*, 1989; Swink and Way, 1995; Chatha and Butt, 2015). While much agreement exists regarding the decision areas that are of strategic importance to the manufacturing function (Rudberg and Olhager, 2003), the approaches for making manufacturing strategy decisions have been the subject of a long-standing debate (da Silveira and Sousa, 2010). Different, though interrelated and partially overlapping paradigms of choice have been advocated, each with its strengths and weaknesses (Voss, 1995, 2005). For the purposes of this study, the "competing through manufacturing" paradigm (Voss, 1995, p. 6), also referred to as the "capabilities" paradigm (da Silveira and Sousa, 2010, p. 1222), is particularly relevant. Advocates of this paradigm have suggested that the true objective of a manufacturing strategy is to build competencies for a sustainable competitive advantage (da Silveira and Sousa, 2010).

Four basic manufacturing capabilities have consistently been stressed in prior research – low cost, quality, flexibility and delivery – but the discussion regarding their interrelationships has been heated (Boyer and Lewis, 2002). The notion of MC can be seen within the context of this debate (Squire *et al.*, 2006), as the advent of MC was predicated on the assumption that "companies *can* overcome the traditional trade-offs" (Pine *et al.*, 1993, p. 111) between product customization – a dimension of flexibility – and cost, quality and delivery performance (Squire *et al.*, 2006). Accordingly, the choice of building the capability of overcoming these manufacturing trade-offs – i.e. the operational capability of MC – can be seen as an important part of a firm's operations strategy (Sousa and da Silveira, 2019), along with the set of consistent, structural and infrastructural choices required to build this capability (cf. Boyer and Lewis, 2002). The question of how to develop the operational capability of MC has been investigated extensively (for a review of prior research, see Fogliatto *et al.* (2012) and Suzic *et al.* (2018)), with an initial focus on technological enablers that has progressively broadened to also encompass organizational enablers (Trentin *et al.*, 2019). Another question that has attracted growing interest, as observed in Section 1, is what drives the value of MC, especially in B2C industries (for a review of prior research, see Merle *et al.* (2010) and Fogliatto *et al.* (2012)).

The diffusion of MC in B2C industries has been linked to the growing importance of subjectivity in consumption (Addis and Holbrook, 2001). Possessing a product that reflects the individual, idiosyncratic aspects of a consumer's self-concept is regarded as one of the fundamental benefits of MC from the consumer's perspective (Chang *et al.*, 2009; Merle *et al.*, 2010; Sandrin *et al.*, 2017). The possibility of self-expression offered by a mass-customized product is expected to make the consumer's personal identity more salient while he or she is customizing the product. According to the notion of functional antagonism posited by the social identity approach (Hornsey, 2008), the salience of the consumer's personal identity increases at the relative exclusion of his or her social identity as a member of his or her group of affiliation. Therefore, MC is expected to produce a shift in the consumer's identity from the social to the personal level. This shift alleviates the pressure on the consumer toward positive distinctiveness of his or her group of affiliation, thus mitigating the tendency to favor (disfavor) a product based on the in-group (out-group) *status* of its COO in a given decision situation.

Interestingly, this rationale closely echoes Swaminathan *et al.*'s (2007) logical argument – corroborated by experimental evidence – that the situational priming of personal identity (*vs* social identity) mitigates the positive influence of local branding (*vs* foreign branding) on brand equity. Indirectly, our logic is also supported by Gürhan-Canli and Maheswaran's (2000) argument – also corroborated by experimental evidence – that domestic products are less likely to be preferred over foreign products in individualist cultures, where people tend to be emotionally detached from the in-group, than in collectivist cultures, where an individual's self is defined in terms of others, and behavior is regulated by group norms. Further support for our argument can be found in prior research on the role of psychological ownership in consumer behavior. Psychological ownership is a psychological state in which an object is experienced as having a close connection with an individual's self (Pierce *et al.*, 2003), thus becoming a part of his or her "extended self" (Belk, 1988, p. 139). This object–self connection may involve an individual's personal identity as well as his or her social identity (Belk, 1988; Gineikiene *et al.*, 2017). Accordingly, psychological ownership may not only be an individual-level phenomenon but also a group-level one (Pierce and Jussila, 2010). For example, preferences for domestic products have recently been explained by Gineikiene *et al.* (2017) using psychological ownership at the group level. As the investment of energy required from a consumer to self-customize a product has been argued to foster psychological ownership at the individual – rather than group – level (Franke *et al.*, 2010), the preference bias in favor of domestic products is thus expected to diminish when products are mass-customized rather than mass-produced.

Based on these arguments, we posit the following research hypothesis:

Assuming that consumers rate the quality of a product originating in an in-group country higher than the quality of the same product from an out-group country, this perceived product quality difference is reduced when the product is mass-customized instead of being mass-produced.

3. Method

The research hypothesis was tested using a 2 × 2 × 2 mixed between- and within-subject experimental design (cf. Field and Hole, 2003; Seltman, 2012). The study included one within-subject factor, COO (Germany *vs* Italy), and two between-subject factors, product type (mass-customized *vs* mass-produced product) and ethnic affiliation (native German-speaking *vs* native Italian-speaking ST). The choice of a within-subject design has the advantage of increasing the statistical power of the experiment without reducing the generalizability of its results (Seltman, 2012) by removing subject-to-subject variation from the investigation of the relative effects of different COOs. This advantage, however, may come at the price of a slew of confounding factors potentially introduced by a within-subject design, such as experimenter demand effects – also known as demand artifacts – and sensitization to the within-subject factor (Charness *et al.*, 2012). The procedures followed in this study to reduce these disadvantages are described in Section 3.4. Importantly, a within-subject experiment, when carefully designed to mitigate its drawbacks, has another major advantage – increased realism – as much of consumer behavior is analogous to a within-subject experiment (D'Alessandro and Pecotich, 2013).

3.1 Sample

Data were collected through an intercept survey conducted in one of the major shopping centers in South Tyrol, the northernmost Italian province, at the borders with Austria and Switzerland. The choice of sampling ST consumers was motivated by two reasons. First, the ST population is mainly composed of two distinct ethnic groups: German- and Italian-native speakers (Taverna *et al.*, 2011). Second, the extant literature provides evidence that the relations between the two groups remain conflicting, at least to some extent, and that native Italian-speaking STs, who have come to feel they suffer a second-class *status*, are able to be critical of the perceived differences of *status* with respect to the German-speaking group (e.g. Capozza and Manganelli Rattazzi, 1999; Costarelli and Colloca, 2004). Therefore, in accord with the social identity approach (Tajfel and Turner, 1986; Hornsey, 2008), both groups are expected to feature in-group bias.

Following Balabanis *et al.* (2002), we attempted to reduce sample selection bias by collecting data over the whole course of the day (from morning to evening) and on different days of the week. Passersby were stopped at random and asked to participate in the survey. In total, 165 people agreed to participate.

Participants were classified as native Italian- or German-speaking STs using Laroche *et al.*'s (2003) validated procedure to measure ethnic affiliation. Specifically, participants were asked to give a distribution in terms of the percentage of time – from 0 (never) to 100 (all the time) – that they use Italian, German or another language during 11 activities (at home, with relatives, with friends, reading newspapers, watching television, listening to the radio, reading magazines, reading books, while shopping, at work and at school). The scores on this language scale were subsequently used as input variables in a cluster analysis. Specifically, a hierarchical method based on the Ward algorithm was adopted to separate the two clusters. To handle the large number of missing data on the use of language at work and school, likely because most people are either working or going to school, these activities were combined into a single activity. With this approach, it was possible to allocate 162 participants to the

two clusters, thus classifying 85 respondents as native Italian-speaking STs and 77 as native German-speaking STs [1]. Potential differences between the two clusters in the demographics reported in Table 1 were analyzed using *chi*-square tests. No significant differences were found at $p < 0.10$, indicating that the two clusters were comparable in terms of gender, age, education and household income.

3.2 Country of origin selection

Two source countries were selected, so that we could observe a product's liability of foreignness in both groups of consumers comprising our sample. Besides Italy – the motherland of native Italian-speaking STs – we did not select Austria – the home country of native German-speaking STs – but rather Germany, for two reasons. First, this choice did not appear to conflict with the objective of observing the liability-of-foreignness phenomenon in the group of native German-speaking STs, as Austria and Germany belong to the same cultural cluster – the Germanic Europe cluster – while Italy is part of the so-called Latin Europe cluster (e.g. House *et al.*, 2004). Therefore, the task of evaluating two products of the same kind that originate, respectively, in Italy and Germany was expected to activate, for native German-speaking STs, their social identity as members of Germanic Europe as opposed to Latin Europe. Stated otherwise, the evaluation task was expected to lead native German-speaking STs to see Germany as the in-group country and Italy as the out-group one, even though Germany was not their motherland.

Second, the selection of Germany and Italy instead of Austria and Italy alleviated the risk that cognitive mechanisms would have a confounding effect in the experiment, for several reasons. First, both Germany and Italy were in the top ten countries with the highest nominal gross domestic product at the time this research was designed, while Austria was only 28th (International Monetary Fund World Economic Outlook, 2015). In addition, both "Made in Germany" and "Made in Italy" were in the top five of the "Made in" ranking list according to FutureBrand (2014), while "Made in Austria" was not even in the top 20. Finally, both Germany and Italy were more likely to be renowned for the MC capabilities of some of their companies (cf. Moser and Piller, 2006).

Variable		Cluster 1 (native Italian-speaking STs) %	Cluster 2 (native German-speaking STs) %
Gender	Female	50.6	45.5
	Male	49.4	54.5
Age	Less than 35	37.6	49.4
	35–49	38.8	32.5
	50–65	20.0	16.9
	More than 65	3.5	1.3
Education	Middle school	21.2	22.1
	High school	56.5	61.0
	University	14.1	11.7
	No answer[a]	8.2	5.2
Household Income (EUR)	Less than 20,000	17.6	16.9
	20,000–39,999	29.4	42.9
	40,000–59,999	24.7	16.9
	No answer[a]	28.2	23.4

Table 1. Sample demographics

Note(s): [a] Little's test was performed to check if those responses were missing completely at random (MCAR). The resulting *p*-value was non-significant ($p > 0.10$), indicating that the responses were MCAR

3.3 Product selection

Sneakers were selected as a product stimulus for two reasons. First and foremost, this choice reduced the risk that ST consumers' perceptions of how typical of Italy or of Germany a certain product is would have a confounding effect in the experiment. To assess this risk in the present study, a pre-test was conducted with 62 potential customers randomly selected from both native Italian- and German-speaking STs. Each respondent was asked to rate sneakers on two, seven-point, bipolar semantic differential scales ranging from "not a typical Italian (German) product" to "a typical Italian (German) product." For each respondent, the difference between these two ratings was calculated. Subsequently, the null hypothesis that this difference is equal to zero was tested using one-sample *t*-test in each of the two sub-samples of native Italian- and German-speaking STs, respectively. Assumptions required for the *t*-test were not violated. The results suggested that sneakers were not considered a more typical product of Italy or of Germany by either native Italian-speaking STs ($t(25) = -0.787$, $p = 0.439$) or native German-speaking STs ($t(35) = 0.142$, $p = 0.888$).

Second, sneakers are a type of shoe that has experienced an exponential increase in product variety over time (Aichner and Coletti, 2013). Thus, it is not by chance that sneakers have been selected for other quantitative studies on B2C MC (e.g. Merle *et al.*, 2010; Sandrin *et al.*, 2017).

3.4 Data collection procedure

The experiment made use of physical products, in addition to verbal and graphical product descriptions, as the latter have been criticized for their lack of realism and their inflation of the COO effect (Peterson and Jolibert, 1995). Specifically, each participant in the experiment was presented two pairs of different, non-branded sneaker models – hereafter referred to as Model A and Model B – which were associated with the two COOs under examination. The two models had a similar shape but were manufactured by different producers, had different colors and differed slightly in attributes such as the number of zippers and the number of holes for shoelaces. To ensure that every participant noticed the COO cues, the COOs of the two pairs of sneakers were communicated explicitly, by writing the phrase "Made in Italy" or "Made in Germany" on the questionnaire, and implicitly, by placing the respective country flag next to the image of the sneaker on the questionnaire. In addition, the COO was indicated orally by the interviewer.

Associating the two COOs with two different models of sneakers enabled camouflaging the only within-subject factor in the experiment (i.e. COO). This helped reduce both sensitization to this factor and experimenter demand effects, i.e. the likelihood that participants "discovered" the purpose of the study and thus attempted to answer in a way that they thought would please the experimenters. This advantage, however, came at the price of possible confounding effects that could derive from the slight differences in the two sneaker models. To address this potential source of bias, the COO of Model A and the COO of Model B were exchanged in the experiment in such a way that approximately 50% of the participants assessed Model A "Made in Italy" and Model B "Made in Germany," while the remaining ones evaluated Model A "Made in Germany" and Model B "Made in Italy"[2].

For each model, the stimulus in the "MC" condition included an informational sheet showing the various customization options and, for illustrative purposes, the image of one example of a mass-customized sneaker – the same that was used as a tangible product stimulus (Figures A1 and A2). All the customization options were explained to each subject in the "MC" condition to ensure that they were fully understood. Furthermore, participants were informed that each sneaker model could be customized according to their personal needs by making a choice for each option, and they were asked to express their preferences.

As the images of the physical products and the associated COOs were to be printed on the questionnaire, four different versions of the questionnaire were developed (Table 2), each

available in both Italian and German. The four versions contained exactly the same set of items aimed to measure ethnic affiliation (Section 3.1) and perceived product quality (Table 3). For each participant, the version of the questionnaire was assigned randomly by having a computer individually generate a random number from 1 to 4 for each subject. To confirm the random assignment of subjects to the four different questionnaire versions, *chi*-square tests were performed for the demographics reported in Table 1. No significant differences were found ($p > 0.10$).

Each participant received both pairs of sneakers and was asked to assess the product quality of each pair. There was no time limitation to accomplish the evaluative task, and participants were prohibited to speak to other participants or to personal companions.

4. Results

Measurement quality was assessed via confirmatory factor analysis (CFA) using LISREL 8.80. The CFA model showed a good fit with the data: χ^2(df) = 26.548 (19), X^2/df = 1.397; comparative fit index (CFI) = 0.993, root mean square error of approximation (RMSEA) (90% CI) = 0.0399 (0.0; 0.0839). The CFA results (Table 3) showed acceptable unidimensionality, convergent validity and reliability of the multi-item measurement scale of perceived product quality for both Italian and German sneakers. As the scale was unidimensional in both cases,

Table 2.
Questionnaire versions

Product type		Product's COO	
		Italy	Germany
Mass-produced sneakers	Questionnaire version 1	Model A	Model B
	Questionnaire version 2	Model B	Model A
Mass-customized sneakers	Questionnaire version 3	Model A	Model B
	Questionnaire version 4	Model B	Model A

Table 3.
Measures and CFA results

Construct	Measurement items	Standardized factor loading[a]	Composite reliability	Average variance extracted
Perceived product quality[1] (sneakers "Made in Italy")			0.900	0.694
	Please rate the sneaker			
	Poor workmanship – excellent workmanship[b]	0.812		
	Not durable – very durable[b]	0.823		
	Not reliable – very reliable[b]	0.869		
	Poor quality – excellent quality[b]	0.826		
Perceived product quality[1] (sneakers "Made in Germany")			0.930	0.768
	Please rate the sneaker			
	Poor workmanship – excellent workmanship[b]	0.869		
	Not durable – very durable[b]	0.886		
	Not reliable – very reliable[b]	0.890		
	Poor quality – excellent quality[b]	0.859		

Note(s): [1] Chao (1998), Dodds *et al.* (1991); [a] all significant at $p < 0.001$; [b] seven-point, bipolar semantic differential scale

we decided to use summated scales in the subsequent analyses, in accord with Nasser-Abu Alhija and Wisenbaker (2006).

To test the research hypothesis, a 2 × 2 × 2 mixed analysis of variance (ANOVA) was performed using SPSS 22. First, violations of the assumptions required for the analysis were checked for. The independence assumption was satisfied because each participant had answered the questionnaire without speaking to other participants. Likewise, the assumption of homogeneity of variance across the eight groups was met, as Levene's test was non-significant ($p > 0.10$). The sphericity assumption was equally satisfied because the only within-subject factor – COO – had only two levels (Seltman, 2012). As for the normality assumption, Shapiro–Wilk tests were non-significant ($p > 0.10$) for five of the eight groups, but they were significant for the remaining three. Although this finding suggested violation of the normality assumption, the ANOVA was deemed appropriate for the analysis of the data because it is robust to deviations from normality for sample sizes greater than five (Norman, 2010).

The results of the ANOVA showed a significant, three-way interaction effect between the product's COO (Germany *vs* Italy), the participant's ethnic affiliation (native German- *vs* native Italian-speaking ST) and the product type (mass-customized *vs* mass produced sneakers) ($F(1, 158) = 11.197$, $p < 0.01$, partial eta square = 0.066). This result indicated that the impact of the interaction between COO and ethnic affiliation on perceived product quality was contingent upon the product type. To understand whether this moderating effect was in line with our research hypothesis, we performed pairwise comparisons, the results of which are reported in the following and are graphically depicted in Figures 1 and 2.

When sneakers were mass-produced and were rated by native Italian-speaking STs, the perceived quality of Italian sneakers was, on average, higher than that of German sneakers (Figure 1a), and this difference was significant ($p < 0.001$). Similarly, when the same shoes were evaluated by native German-speaking STs, the mean difference in perceived product quality between German and Italian sneakers was positive (Figure 1b) and significant ($p < 0.05$). Taken together, these findings indicated that, when evaluating mass-produced sneakers, native Italian-speaking (German-speaking) STs favored the sneakers from Italy (Germany) – the in-group country in the evaluation task – over those from Germany (Italy) – the out-group country. In other words, the sneakers from the out-group country suffered from the liability of foreignness across both native Italian- and German-speaking STs.

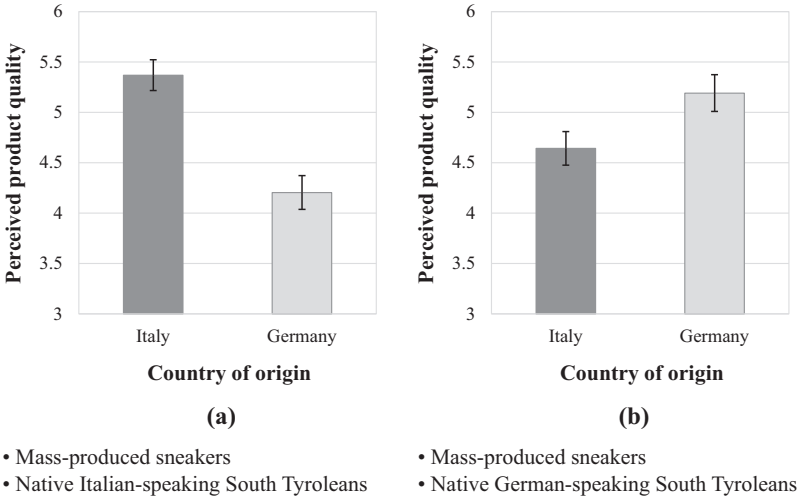

Figure 1.
Pairwise comparisons between means of perceived product quality for mass-produced sneakers. Error bars show the standard error of the means

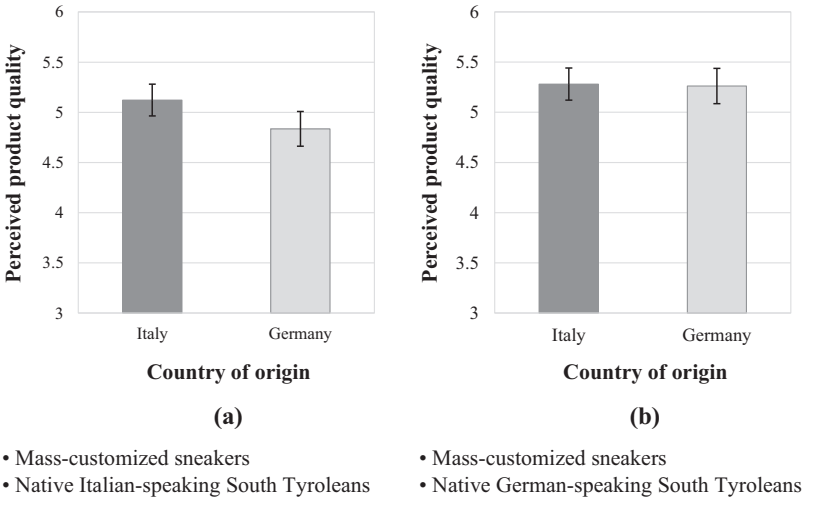

Figure 2.
Pairwise comparisons between means of perceived product quality for mass-customized sneakers. Error bars show the standard error of the means

However, when native Italian-speaking STs rated mass-customized sneakers, no statistically significant difference was found ($p > 0.10$) in the mean perceived product quality between Italian and German sneakers (Figure 2a), consistent with the research hypothesis that MC mitigates a product's liability of foreignness. Likewise, when mass-customized sneakers were evaluated by native German-speaking STs, no statistically significant difference was detected ($p > 0.10$) between the average values of perceived product quality for German and Italian sneakers (Figure 2b). In summary, support for the hypothesized bias-mitigation effect of MC was found in both groups of ST consumers.

5. Discussion and conclusions

5.1 Theoretical implications

By bridging the two, previously unrelated research streams on MC and COO, the present study contributes to each of these two lines of inquiry in a unique manner. Regarding MC, this paper joins the discussion on MC value and the economics of MC (cf. Fogliatto *et al.*, 2012). This debate has not been overlooked by OM journals, which have contributed to a better understanding of the sources of MC value (e.g. Piller *et al.*, 2004; Merle *et al.*, 2010, Fogliatto *et al.*, 2012), sometimes by building upon theories from other fields, such as the uniqueness theory from social psychology and the self-concept theory from consumer psychology (cf. Merle *et al.*, 2010). This borrowing can be seen as part of a broader phenomenon revealed by Pilkington and Meredith (2018), i.e. the trend of leading OM journals increasingly referencing knowledge from other disciplines, such as marketing and strategy. In line with this trend, the present paper draws upon the social identity approach – from the field of social psychology – to hypothesize another mechanism through which MC can create value: by countering a product's possible liability of foreignness. By finding empirical support for this hypothesis, the present paper not only advances knowledge of the drivers of MC value but also improves the understanding of the role that MC can play in a firm's sales internationalization strategy, at least in B2C industries. Prior research (e.g. Calantone *et al.*, 2004) has observed that a company's expansion into foreign markets inherently increases the firm's product variety, assuming that the company decides to adapt the physical characteristics of its products for the export markets – in an attempt to better satisfy the needs and wants of customers in

different countries – or is forced to adapt its products to comply with local regulations. Under these assumptions, it is apparent that the operational capability of MC supports sales internationalization by preventing increased product variety from significantly impairing cost, delivery and quality performance. However, the results of this paper suggest another, perhaps less obvious way that the operational capability of MC can enhance the profitability of an export venture: by mitigating a product's possible liability of foreignness and, thus, increasing perceived product quality in export markets. This additional link between operations and marketing strategies can be interpreted through the lens of the "competing through manufacturing" paradigm in the field of operations strategy (Section 2.3). In its simplest form, this paradigm argues that manufacturing capabilities should align with the business strategy that others have defined (Voss, 1995; Wheelwright and Hayes, 1985). While this may be a worthy first step for many firms, a higher stage of competitive effectiveness of manufacturing requires this function to take a more proactive role – an equal role, as compared with other functions – in defining the business strategy (Wheelwright, 1984; Wheelwright and Hayes, 1985). In this most progressive stage, "competitive strategy rests to a significant degree on a company's manufacturing capability" (Wheelwright and Hayes, 1985, p. 103), and manufacturing is "centrally involved in major decision-making in other functions" (Barnes and Rowbotham, 2004, p. 706). By suggesting that the role played by the operational capability of MC in the definition of a firm's sales internationalization strategy can be more proactive than is implied by the extant literature, the present paper confirms the validity of Hayes and Wheelwright's (1984, p. 41) challenge to "the idea that the role of the manufacturing function is simply to assist in implementing the strategy that others have developed." By doing so, the present paper ultimately contributes to outlining an increasingly mature – externally supportive, according to Wheelwright and Hayes's (1985) terminology – role (Barnes and Rowbotham, 2004) of the operational capability of MC.

Another connection of the present study's results to the operations strategy literature involves one of the most commonly cited strategic decisions for the operations function: where to locate a firm's manufacturing facilities (Rudberg and Olhager, 2003). Prior research has identified many factors that influence this decision (cf. Johansson and Olhager, 2018), including customers' characteristics (e.g. MacCarthy and Atthirawong, 2003), such as their inner norms and values. As discussed in Section 2.2, consumers' personal motive to maintain a positive self-concept may explain their bias toward domestic products or, in the absence of domestic alternatives, toward products that originate in culturally similar countries. Establishing a manufacturing presence in a foreign market has been suggested as a possible strategy to counter this bias (e.g. Cohen and Lee, 1989; Lewin *et al.*, 1998). The results of the present study indicate that the operational capability of MC may also alleviate this bias. Thus, this possibility is another factor that should be considered in manufacturing location decisions, at least when firms are expanding into foreign markets.

Seen through the lens of the COO literature, the results of this study enrich the discussion on the moderators of the COO effect. Twenty-five years ago, Peterson and Jolibert (1995), considering the difficulty of making broad generalizations regarding the influence of the COO cue on consumers' product evaluations, were the first to carry out a meta-analysis of the COO effect to identify moderating variables affecting the occurrence, direction and magnitude of this effect. Since then, other researchers have responded to their call for more research on the moderators of the COO effect, which have come to include a broad set of factors, including whether subjects are presented only with information about a product's COO or also with other intrinsic and/or extrinsic cues (Verlegh and Steenkamp, 1999). Interestingly, none of the studies in which the COO cue has been presented along with intrinsic product information has considered the possibility for a consumer to configure the product according to his or her idiosyncratic needs – a possibility offered by the manufacturer's operational capability of MC. This research gap is somewhat surprising, considering the growing popularity of MC in

many industries and recalls Li and Wyer's (1994, pp. 187–188) words: "country-of-origin effects are not clearly understood under many conditions in which products are evaluated." Many years have passed since this remark was made, and the COO effect has been examined in a variety of contexts (Carlsson Hauff and Nilsson, 2017). Yet, the present study is the first to investigate this effect under the condition that a product is mass-customized rather than mass-produced. The theoretical and empirical results of this study enrich the debate on the moderators of the COO effect by indicating the operational capability of MC as another factor that can influence this effect.

5.2 Limitations and future research directions

Several limitations of the present study must be acknowledged, which represent opportunities for further research. First, the research hypothesis was tested in a specific sample. This is acceptable for theory-testing purposes, as theory testing calls for falsification procedures: "The research sample need only allow a test of the theory. And, any sample within the theory's domain (e.g. any relevant sample), not just a representative one, can provide such a test" (Calder *et al.*, 1981, p. 200). Nonetheless, the specificity of our sample inevitably limits the generalizability of the effects detected in this study, and therefore, future research should seek to replicate the results with other samples. For example, future studies could investigate whether the effect of MC would remain the same as that observed in this work if the sample of consumers was drawn from a non-Western population rather than Westerners, who tend to emphasize the fulfillment of their personal goals and desires (Riemer *et al.*, 2014).

Second, the research hypothesis was tested using a specific product stimulus. Sneakers fall within the category of self-expressive goods (Franke and Hader, 2014), also known as value-expressive goods (Locander and Spivey, 1978), which are consumer products that, because of the relevance of their aesthetic properties (Franke and Hader, 2014), lend themselves to giving positive expression to a consumer's self-concept (Locander and Spivey, 1978). This kind of product could reinforce the priming of personal identity that MC inherently brings about. If this conjecture is correct, then the mitigation of in-group bias should be stronger when the MC concept is applied to self-expressive products than when it involves other types of consumer goods, such as personal computers. However, the testing of this hypothesis, which would require manipulating the self-expressiveness benefit that consumers derive from different types of mass-customized products (cf. Merle *et al.*, 2010), is left for further research. Likewise, it would be possible to extend the present study to industrial goods. As buyers of industrial goods do not purchase for themselves, one could expect that the findings of this study are of little relevance to business-to-business contexts. Although reasonable, this conjecture should, nonetheless, undergo empirical scrutiny.

Third, the research hypothesis was tested using two specific source countries: Germany and Italy. As explained in Section 3.2, we purposefully selected two developed nations that ranked high in the "Made in" ranking list to alleviate the risk that cognitive mechanisms would have a confounding effect in the experiment. Future research could investigate whether the effect of MC would remain the same as that observed in this study if one or both of the source countries were a less developed nation with a less favorable image. By doing so, future research would help determine whether MC can help products from developing economies to overcome negative national stereotypes – with their cognitive, affective and normative connotations (Chattalas *et al.*, 2008) – among consumers who live in more developed countries. Clearly, addressing this question will require consideration of the cognitive and affective mechanisms behind the COO effect.

Another interesting opportunity for further research would be to examine how MC influences the COO effect at varying levels of consumer-perceived complexity of the product customization task. Prior research has shown that too many customization options, as well as tradeoffs

between attractive levels of different product attributes, may cause consumers to experience information overload and selection difficulty (e.g. Gourville and Soman, 2005). The existing literature also suggests that the COO cue may function as a simplifying heuristic for inferring product quality when the amount of information about intrinsic attributes is large and difficult to integrate (Hong and Wyer, 1989; Li and Wyer, 1994). Therefore, one could conjecture that, whenever consumers find the product customization task excessively complex, a cognitive mechanism comes into play whereby MC strengthens the impact of the COO cue on perceived product quality. In this case, the reinforcement of the COO effect through this cognitive mechanism could offset the mitigation of the same effect that this study has theoretically hypothesized, based on a normative mechanism, and empirically demonstrated in an experiment that alleviated the risk of confounding effects of a cognitive nature. Clearly, the theoretical and empirical examination of this conjecture will require investigating the COO effect from an information-processing perspective (cf. Hong and Wyer, 1989) as well as manipulating the consumer-perceived complexity of the product customization task.

In summary, if the generalizability of the results of the present study is to be better understood, this new line of inquiry on the impact of MC on the COO effect should be extended in many directions. Examining other combinations of product type, COO and country of destination as well other mechanisms underlying the COO effect is crucial for assessing the potential of MC to overcome the intangible barrier constituted by consumer bias based on a product's COO. Eventually, this will enable future research to develop a framework that assists companies – especially those that produce and sell globally – in making the intertwined decisions on COO and MC for each of their different geographical target markets.

5.3 Managerial implications

Although a framework to support decision-making remains an objective for future research, we believe that the results of this study are of interest to practitioners for at least two reasons: first, the globalization of markets (Cheng *et al.*, 2015), and second, the difficulty a firm may encounter in persuading foreign customers to trust its products when similar goods are made in their home country (Brooks, 2019). Even for globally leading brands, such as Coca-Cola, local competition can be challenging. For example, both the Austrian brand Almdudler, with about 20% (Coca-Cola Österreich, 2019), and the Swiss brand Rivella, with about 16% (Schultz, 2019), have a considerable market share in their respective home countries. Local brands can even outperform global competition, as witnessed by the Scottish brand Irn-Bru, often referred to as "Scotland's other national drink" besides whisky (Dew, 2018), which is the best-selling brand in Scotland and the third most popular in the UK (Hosie, 2018).

In this context, the present paper has an interesting message for managers: a firm's operational capability of MC supports expansion into foreign markets not only by reducing the costs of product adaptation for the export markets – as implied by prior research – but also by countering the liability of foreignness of the firm's products, at least for the combinations of product, COO and target customers considered in this study. Undeniably, firms providing products other than sneakers, made in countries other than Germany or Italy and targeted to customers other than native German- and native Italian-speaking STs should investigate whether this value creation mechanism also applies to their case. However, if it does, the mitigation of the liability of foreignness would be an additional benefit – besides the ones recognized in the extant literature – that might contribute to justifying the companies' efforts to develop their operational capability of MC.

Notes

1. Compared with the ST population, the sample was slightly biased in favor of male, younger and more educated people.

2. To understand whether sneaker model influenced the results of the experiment, another between-subject factor, which describes the two combinations of sneaker model and COO that were used in the experiment, was initially included in the analysis as a control variable. No significant effect of this variable was found ($p > 0.10$), indicating that the sneaker model had not influenced consumers' product quality perceptions in the experiment.

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Appendix

Figures A1 and A2 show the examples of mass-customized sneakers used as tangible product stimuli, as well as the customization options, for Models A and B, respectively. The customization options and their values were defined based on the analysis of several online sales configurators for sneakers. The corresponding mass-produced sneakers were the same as the ones depicted in the two figures, but without the custom image with photo-realistic colors for Model A, and without the custom text for Model B.

Figure A1.
Customization options and the example of mass-customized sneakers used as a tangible product stimulus for Model A

Note(s): a = color of upper leather (30 available choices); b = color of shoelaces (22); c = color of zipper (2); d = custom text or image with photo-realistic colors; e = sole material (3) and sole color (5)

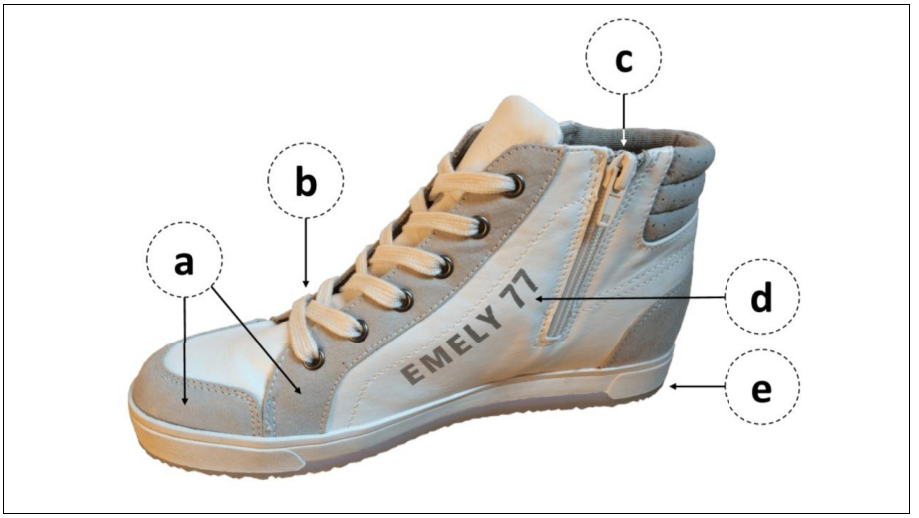

Figure A2.
Customization options and the example of mass-customized sneakers used as a tangible product stimulus for Model B

Note(s): a = color of leather stripes (30 available choices); b = color of shoelaces (22); c = color of zipper (2); d = custom text (up to 10 symbols) and text color (9); e = sole material (3) and sole color (5)

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