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Preface

This dissertation consists of four self-contained essays separately contributing to research on psychological ownership. Whereas the first essay examines and classifies psychological ownership research in a broader picture with the help of bibliometrics, the other three specifically deal with the emergence of psychological ownership in consumer marketing settings.

In their seminal paper on psychological ownership, Pierce, Kostova, and Dirks (2001, p. 299) define the concept as a “state in which individuals feel as though the target of ownership (material or immaterial in nature) or a piece of it is "theirs" (i.e., "It is MINE!")” without holding any legal entitlement.

In the course of their argumentation, the three authors make several propositions on the nature of psychological ownership. First, legal ownership is not decisive for its appearing. In fact, non-owners can show high levels of psychological ownership while legal owners might not experience psychological ownership for their possession at all. Second, these ownership feelings encompass both thoughts and emotions towards the target object making the state both cognitive and affective (Pierce et al. 2001). Third, the object towards individuals have possessive feelings can be tangible but also intangible like ideas, people, or even words (Pierce, Kostova, Dirks, 2003). Fourth, the concept is distinct from others that also characterize the relationship towards an object such as commitment or identification. Whereas psychological ownership relates to possessiveness, commitment rather includes an affective wish to maintain a relationship with the object. In contrast, identification presents a cognitive state in which the target object is used for social classification and self-display.

Aiming to adopt the target object in the self, the strive for possessions is innately human and motivated by three “roots”, that determine why psychological ownership emerges: a) efficacy and effectance, b) self-identity, and c) having a place (Pierce et al., 2001; Pierce et

al., 2003). Building on the roots of psychological ownership, individuals develop psychological ownership by three key experiences: a) exercise of control, b) coming to know intimately, and c) investing the self. Corresponding to the first root of efficacy and effectance, individuals find pleasure in experiencing them as affecting their environment (Furby, 1978), controlling, for example how and by whom objects are used. As possessions are associated with rights and responsibilities, individuals invest time, effort, resources and finally the self; ultimately coming to know an object intimately (Pierce et al., 2003). Hence, by intimately understanding the meaning of a possession, it expresses the self-identity both to the individuals themselves and others (Pierce et al., 2001; Jussila, Tarkiainen, Sarstedt, & Hair, 2015). Moreover, possession represent a source of metaphorical “home” in which individuals find their place (Pierce et al. 2003).

The concept of psychological ownership has its origin in employee behavior where it has become an important predictor of job-related variables such as job satisfaction, organizational citizenship behavior, or organizational stewardship (e.g., Avey, Avolio, Crossley, Luthans, 2009; Van Dyne & Pierce, 2004). Yet, psychological ownership has branched in a variety of research realms such as marketing (e.g., Folse, Moulard, & Raggio, 2012; Fuchs, Prandelli, & Schreier, 2010), teaching (e.g., Wood, 2003), or leading family businesses (e.g., Bernhard & O'Driscoll, 2011).

As psychological ownership has found its way in a multitude of research areas, academics and practitioners benefit from state of the art analyses by guidance in positioning research findings as well as guidance in corporate decisions, especially in human resource management and marketing. Research has begun to aggregate research findings on psychological ownership in content-based literature reviews. The fundamental one by Pierce, Kostova, and Dirks (2003) derives the aforementioned roots and roots of psychological ownership and provides an overview on job outcomes. Jussila et al. (2015) transfer the

concept to the marketing context by showing how marketing scholars have addressed the mechanisms of psychological ownership emergence and offer unexplored research avenues. In addition, Dawkins, Tian, Newman, and Martin (2015) reconsider organizational psychological ownership, especially pointing out the concept's inconclusive measurement. These literature reviews provide valuable insights in the emergence of psychological ownership. Yet, a domain-free, quantitative review is missing. Hence, the solely authored *first essay* provides a more objective literature review by drawing on bibliometrics, i.e., using statistical measures to describe a research field (White, 2004). Although never fully replacing content-based state of the art analyses, bibliometric studies offer a more objective supplement (Small, 1973; White & McCain, 1998). As a form of bibliometrics, co-citation analyses rely on the idea that citations represent the impact on a certain research field that researchers acknowledge (Garfield, 1979). Co-citations between two documents A and B equal the number of cases in which a third article jointly cites A and B (McCain, 1990) manifesting a conceptual link between A and B. Hence, intellectual- sometimes even hidden- structures can become apparent in a co-citation analysis (White & McCain, 1998). Applying this bibliometric method on psychological ownership results in ten research streams:

- (1) Concept development/ work outcomes,
- (2) Role of possessions
- (3) Psychological ownership's role in the endowment effect
- (4) Psychological ownership's application in marketing strategies
- (5) Family firms' particularities
- (6) Employee ownership
- (7) Territoriality
- (8) Psychological ownership's route of control
- (9) Organizational identification
- (10) Organizational citizenship behavior

In line with the fourth research stream, marketing research has started to transfer this concept in order to explain customer preferences, e.g.,

- when they are empowered to impact corporate decisions (e.g., Folse et al., 2012; Fuchs et al., 2010),
- when they are allowed to touch objects (e.g., Peck & Shu, 2009; Peck, Barger, & Webb, 2013),
- when they assume different roles as buyers opposed to sellers (corresponding to the endowment effect) (e.g., Reb & Connolly, 2007; Shu & Peck, 2011)
- when they use technology and social media for their own purposes (e.g., Karahanna, Xu, & Zhang, 2015; Kirk, Swain, & Gaskin, 2015; Zhao, Chen, & Wang, 2016).

The following three essays in this dissertation shed further light in the emergence of psychological ownership in consumer behavior. The second and the third one explore psychological ownership in customer empowerment strategies. Customer empowerment describes a shift in value creation (Ogawa & Piller, 2006; Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004). Traditionally, companies were the only value creators delivering goods and services to the customers whose only role was to be recipients of products and whose needs are only reckoned via classical market research. Technological advancements that reduce transaction costs and barriers of customer communication gave rise to customers' increasing strive to have a voice in corporate decisions and to be part in the value creation (Fuchs et al., 2010). Companies like Threadless, Mc Donald's, or FedEx have begun to actively involve customers in the value chain, especially in the new product development, i.e., customer empowerment (Fuchs & Schreier, 2011). At first sight, companies dilute control when empowering customers, but they benefit from better fulfilling customers' needs, more

innovative products, and reduction in costs and business risks (Ogawa & Piller, 2006; Fuchs et al., 2010).

Hence, research has turned attention to this business model in the last decade. A large body of research has discussed the shift from company focused to joint value creation (e.g., Ogawa & Piller, 2006; Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004), others have examined possible ways of implementing customer empowerment (e.g., O’Hern & Rindfleisch, 2010; Fuchs & Schreier, 2011). Apart from the highly recognized paper by Fuchs et al. (2010), research has only recently begun to examine customer responses in greater detail (e.g., Fuchs, Prandelli, Schreier, & Dahl, 2013; Füller & Bilgram, 2017; Heidenreich, Wittkowski, Handrich, & Falk, 2015). Fuchs et al. (2010) show the emergence of psychological ownership when companies allow customers to decide on the product portfolio options. However, their analysis is limited to the interaction between company and customer without interferences from other customers making it less realistic in customer empowerment practice. The *second essay* (co-authored with Joe F Hair, Doreen Neubert, and Marko Sarstedt), therefore, includes other customers’ feedback on the co-created product. In addition, it employs a different form of empowerment by allowing customers to create a product instead of selecting predefined options as Fuchs et al. (2010) have operationalized. Results show psychological ownership’s emergence in this setting. Positive feedback further enhances the positive effects of customer empowerment (increase in product liking, willingness to pay, and word-of-mouth intentions) whereas negative feedback diminishes the effects. Parts of this paper were presented at the *Annual Conference of the Academy of Marketing Science in Indianapolis, USA in 2014*. Moreover, it is published in the peer-reviewed *Journal of Creating Value* in 2016 (Hair, Barth, Neubert, & Sarstedt, 2016).

Based on the notion of self-creating objects, studies on the IKEA effect propose its link to customer empowerment without adopting this context in their experimental design

(Mochon, Norton, & Ariely, 2012). The effect describes an increase in willingness to pay for self-building an object (Norton, Mochon, & Ariely, 2012). Rationality would require the invested effort to be counted as extra costs lowering the willingness to pay compared to a prebuilt object. However, consumers show diametric results. The *third essay* (co-authored with Marko Sarstedt and Doreen Neubert) replicates the IKEA effect adding psychological ownership as a mediator to the self-creation-valuation-link as self-creation serves all three routes to psychological ownership. In addition, it identifies a boundary condition for psychological ownership. Once forced to disassemble the product, both psychological ownership and the IKEA effect dissipate. The third essay is published in the peer-reviewed *Journal of Marketing Behavior* (Sarstedt, Neubert, & Barth, 2017).

The *fourth essay* (co-authored with Frauke Kühn) deals with a different aspect of psychological ownership's role in marketing research. It relates to the effects of product depiction depending on a specific customer characteristic, the need for touch (NFT). NFT describes the importance of touch for product evaluations that some customers experience differentiating them in to high and low NFT customers (Peck & Childers, 2003a).

Touch has found to have significant bearing on product quality perceptions, confidence, and impulsivity in the purchase decision (e.g., Grohmann, Spangenberg, & Sprött, 2007; Peck & Childers, 2003b). By touching an object, feelings of control over the product increase - translating into higher levels of psychological ownership. Psychological ownership in turn then raises product liking and valuation (Brasel & Gips, 2014; Peck, Barger, & Webb, 2013; Peck & Shu, 2009). Despite touch's importance for some customers, it is not always possible, like in e-commerce settings. Research has identified several surrogates; either technically demanding - such as augmented reality (Huang & Liao, 2017) or virtual product use by 3D rotation (Choi & Taylor, 2014) - or hardly practical haptic imagination with eyes closed (Peck et al., 2013; Kamleitner & Feuchtl, 2015). However, none of them has looked at

the power of pictures visualizing touch in order to induce the imagination of touch in the customers' mindsets. As a starting point for this consideration, Sato, Schafer, and Bergen (2015) have shown to activate a possession mindset by presenting pictures that represent holding an object in one's hands. Although with a different research topic, this result might be transferable to product portrayal. Indeed, this study finds a significant difference between low and high NFT customers in product evaluations when touch is visualized by holding the products in hands. These effects are mediated by the level of psychological ownership. High NFT customers more easily feel like owning the product than low NFT customers. However, the haptic nature of the product is decisive. This conclusion can only be drawn for products for which haptics are highly diagnostic, like apparel. For geometrically formed products for which visual inspection is usually sufficient (Citrin, Stem, Spangenberg, & Clark, 2003), high and low NFT customers equally judge products. Again, a boundary condition for psychological ownership is identified: when the hand differs from one's own, psychological ownership does not increase in high NFT customers.

The findings of this doctoral thesis contribute to advancing psychological ownership research not only from a general perspective but also in the realm of marketing in particular in which the concept has been increasingly focus for the last decade. By showing its connections to other emerging topics in marketing research such as customer empowerment and consumers' need for touch, this thesis sheds further light on the emergence contexts of psychological ownership. In that, the four essays enhance understanding the conditions in which ownership feelings develop and in which they fail to appear also offering promising avenues for further research.

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Essay 1

**Identifying Research Streams of
Psychological Ownership: A Co-Citation
Analysis**

Single Authorship

Working Paper

Identifying Research Streams of Psychological Ownership: A Co-Citation Analysis

Abstract

Psychological ownership describes feelings of possession towards an (im-)material object without legal entitlements. Originating from organizational behavior research, the concept has been expanded to a variety of research fields, e.g., marketing, teaching, or children's development. Hence, research has started to structure the diverse literature in content-based reviews. Complementary to these content-based reviews, bibliometric analyses, i.e., applying statistical methods on citation data, offer a quantitative perspective. As a form of bibliometrics, co-citations identify intellectual connections between scientific articles that researchers tie when jointly citing them. Results show ten distinct research streams that scientists have worked on when examining psychological ownership. Academics and managers can draw on these ten discourses to position their research and to guide corporate decisions.

Keywords:

Psychological ownership, co-citation analysis, bibliometrics; literature review

Introduction

The concept of psychological ownership (PO) refers to “state in which individuals feel as though the target of ownership (material or immaterial in nature) or a piece of it is "theirs" (Pierce, Kostova, and Dirks, 2001, p. 299). These feelings of possession individuals have towards (im-)material objects can emerge decoupled from any legal ownership (Pierce et al., 2001). Research has discussed these ownership feelings in various contexts such as:

- employee behavior (e.g., Avey, Avolio, Crossley, Luthans, 2009; Pierce et al., 2001; Van Dyne & Pierce, 2004),
- particularities of family businesses (e.g., Bernhard & O'Driscoll, 2011; Henssen, Voordeckers, Lambrechts, & Koiranen, 2014; Ikävalko, Pihkala, & Jussila, 2008),
- customer preferences (e.g., Folse, Moulard, Guidry, & Raggio, 2012); Fuchs, Prandelli, & Schreier, 2010; Hair, Barth, Neubert, & Sarstedt, 2016),
- teaching (e.g., Ketelaar, Beijgaard, Boshuizen, & Den Brok, 2012; Wood, 2003),
- agriculture and foresting (e.g., Arora, Bert, Podesta, Krantz, 2015; Lähdesmäki, & Matilainen, 2014),
- nursing and children's development (e.g., Kaur, Sambasivan, & Kumar, 2013; Pesowski & Friedmann, 2016; Verkuyten, Sierksma, & Martinovic, 2015), or
- knowledge sharing (e.g., Héliot & Riley, 2010; Peng, 2013; Peng & Pierce, 2015).

Due to PO's relevance for a variety of research fields as well as its important touch points with business' practices in human resource management and marketing, a comprehensive analysis of the state of the art on PO is useful both for scholars and for practitioners. The first ones benefit from this analysis by helping to position research findings whereas managers can use them as a guideline in developing corporate strategies.

Three papers have already provided content-based reviews on PO in specific fields of research. Most prominently, Pierce; Kostova, and Dirks (2003) extensively present fundamental research on the relevance of personal belongings to the (self-)perception of

individuals deducing psychological ownership's origin, definition, motives, and mechanisms of emergence. Jussila, Tarkiainen, Sarstedt, and Hair (2015) aggregate research on PO in the marketing context deriving how customers develop a sense of possession for brands and products. Dawkins, Tian, Newman, and Martin (2015) explicitly exclude the findings of Jussila et al. (2015) offering a literature review in organizational PO, especially pointing out shortcomings of its current measurement and avenues for future research in the workplace context. In sum, a review on the state-of-the-art of PO in a broader perspective that is not restricted to a specific discipline does not exist.

Besides content-based reviews, bibliometrics such as (co-)citation analyses constitute a useful addition and validation method yielding a quantitative and thus more objective overview on a focal topic (Small, 1973; White & McCain, 1998). Bibliometrics refer to the application of statistics on any form of publications in order to detect structural patterns (White, 2004). With the help of bibliometric analyses, authors have examined research on open innovation (Randhawa, Wilden, & Hohberger, 2016), conjoint analysis (Teichert & Schehu, 2010), service research (Kunz & Hogueve, 2011), or mergers and acquisitions (Ferreira, Santos, de Almeida, & Reis, 2014). Even ad hoc seemingly rather diverse research topics published in an entire journal have been focus of bibliometrics (e.g., *Journal of Consumer Research* (Hoffman & Holbrook, 1993), *Strategic Management Journal* (Ramos-Rodriguez & Ruiz-Navarro, 2004), or *Journal of Product Innovation Management* (Durisin, Calabretta, & Parmeggiani, 2010)).

As part of bibliometrics, citation and subsequently co-citation analyses are based on the assumption that citations express a content relation and intellectual link that scientists see between their work and previous research (McCain, 1990; Small, 1973; Teichert & Schehu, 2010). By citing a document, scholars acknowledge important contributions to the respective research field (Garfield, 1979). Hence, (high) citation frequencies represents major ideas as well as their impact within the research field. Building on this notion, a co-citation constitutes

the number of cases in which two documents are jointly cited by a third one (McCain, 1990; Small, 1973). As such, a co-citation analysis measures the strength of connection among research articles since two documents that are often cited together are expected to be also intellectually related and to share similar concepts. Thus, a co-citation analysis identifies objective, sometimes even unapparent structures in the research field (White & McCain, 1998).

Applying these analysis methods on PO research results in ten discourses that scientists have frequently pursued when publishing their papers dealing PO themselves:

- (1) Concept development/ work outcomes,
- (2) Role of possessions
- (3) PO's role in the endowment effect
- (4) PO's application in marketing strategies
- (5) Family firms' particularities
- (6) Employee ownership
- (7) Territoriality
- (8) PO's route of control
- (9) Organizational identification
- (10) Organizational citizenship behavior

By addressing these issues above, this co-citation study is first to show the different research streams in PO in a comprehensive, quantitative perspective by identifying different school of thoughts, their respective relevant publications, and their general findings. Hence, researchers as well as practitioners can directly draw on major research realms of interest in order to evaluate and steer their own research or managements decisions.

Methodology

Performing a co-citation analysis involves the following steps (Gmür, 2003; McCain, 1990; Small, 1973; Teichert & Schehu, 2010)

- 1) Determine the co-citation approach: author co-citation vs. document co-citation
- 2) Select relevant publications
- 3) Conduct a citation analysis
- 4) Derive co-citation counts for every pair of cited publication
- 5) Construct co-citation matrix including weighting of co-citations
- 6) Perform statistical analyses, e.g., factor analysis, cluster analysis, multidimensional scaling (MDS)
- 7) Identify research streams

(Co-)citation analyses on any topic can be performed based either on (first mentioned) authors (McCain, 1990; White & Griffith, 1981) or on single documents (Gmür, 2003; Small, 1973, 1978). Whereas the first one summarizes "a body of writings by a person" (White & Griffith, 1981, p. 163), the latter one fully captures the information on similarities in particular concepts and findings as authors might have contributed to different research areas (Randhawa et al., 2016; Teichert & Schehu, 2010). Hence, this study applies a document co-citation approach in order to receive a broader picture on the diverse research streams of PO.

The source documents, i.e., scientific publications, for setting up the (co-)citation analysis stem from Web of Science (SSCI) crosschecked with EBSCO host and Google Scholar including search terms such as "psychological ownership", "perceived ownership", "feelings of ownership," "subjective ownership", and "ownership effect". The search was limited to peer reviewed articles and reviews excluding book chapters, proceedings, or working papers from the analysis. This limitation has proven to be best practice among bibliometric studies since journal articles are considered to be "certified knowledge" due to their peer revision process (Ramos-Rodriguez & Ruiz-Navarro, 2004, p. 982). These articles

were then manually screened for their appropriateness and fit with PO. Hence, research papers that mention PO only as a side note or as an avenue for further research in the end of the papers were not included in the analysis (e.g., Fitzsimmons & Stamper, 2014; Luthans, Norman, Avolio, & Avey, 2008; Uhlaner, Floreen, & Geerlings, 2007). This procedure yields 230 relevant scientific papers in a temporal range from 1995 to 2017 that altogether cite 7,906 unique scientific research papers in 1444 journals in turn which are the basis for the following co-citation analysis.

Examining the references of the 230 source documents also involves some data cleaning and streamlining because of different spellings of author names, differing article titles, differing indicated journal sources for the same article, or references that actually never appear in the text. Furthermore, articles that deal with statistical methods, e.g., Baron and Kenny's paper on mediation analysis (1986), are also excluded, as these articles will not help describing research specifically on PO. Next, by gathering information on citation frequency, authors, journals, and publication year, the most influential documents assessed by a variety of scholars can be determined (see Table 1). As such, major contributions, researchers, and publication outlets can be identified.

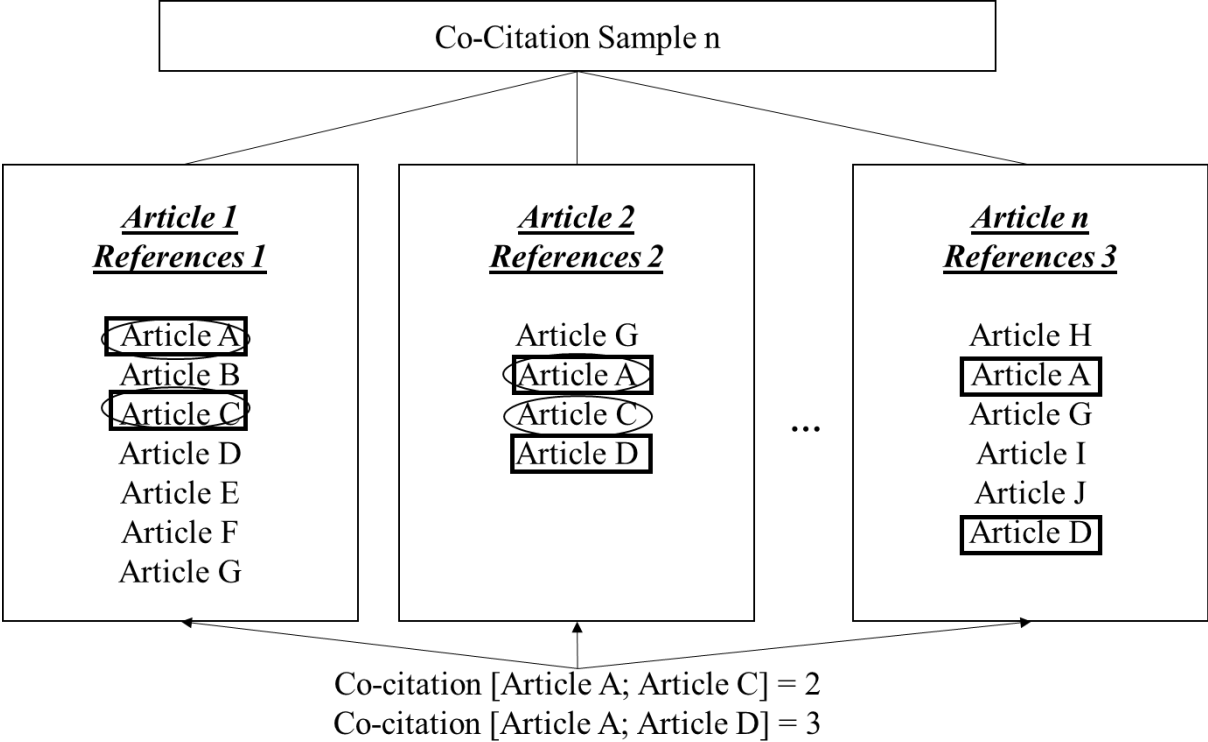
Table 1: Top 10 Journals, First Authors, and Publications in the Co-Citation Sample

Rank	Most Referred Journal	Citations	Most Referred first author	Citations	Most Referred article	Citations
1	Academy of Management Review	598	Pierce Jon L.	519	Pierce et al. (2001), Academy of Management Review	173
2	Journal of Applied Psychology	573	Van Dyne, Linn	139	Pierce et al. (2003), Review of General Psychology	147
3	Journal of Consumer Research	460	Belk, Russel W.	99	Van Dyne & Pierce (2004), Journal of Organizational Behavior	127
4	Academy of Management Journal	450	Furby, Lita	79	Belk (1988), Journal of Consumer Research	78
5	Journal of Organizational Behavior	404	Brown, Graham	75	Pierce et al. (1991), Academy of Management Review	70
6	Journal of Personality and Social Psychology	370	Avey, James B.	69	Vandewalle et al. (1995), Group & Organization Management	69
7	Family Business Review	283	Vandewalle; Don	68	Avey et al. (2009), Journal of Organizational Behavior	67
8	Entrepreneurship Theory & Practice	227	Podsakoff, Philip M.	64	Pierce et al. (2004), Journal of Social Psychology	55
9	Administrative Science Quarterly	197	Beggan, James K.	58	Furby (1978), Social Behavior & Personality	46
10	Journal of Business Venturing Journal of Marketing	166	Peck, Joann	51	Mayhew et al. (2007), Journal of Social Psychology	45

In order to derive the co-citation counts, the number of cases in which every possible pair of cited publications appears in the references of the input papers is determined. Figure 1

(following Ramos-Rodríguez & Ruíz-Navarro, 2004, p. 984) graphically explains the co-citation counts.

Figure 1: Exemplary Determination of Co-Citation Counts



However, not all co-citation counts can be used as a basis for the analysis. There is trade-off between accounting for a detailed description of the research field, interpretability of results as well as manageability of the data collection (Kuntner & Teichert, 2015; McCain, 1990). Hence, articles that have only a limited impact on characterizing a research field need to be excluded from the co-citation analysis. Using all 7,906 cited references would contradict this study’s aim to give a condensed overview on the pillars of psychological ownership. In order to correspond to the reduction in complexity and in the effort of translating citation into co-citation data, thresholds have been adopted in co-citation literature. Some researchers rely on relative measures such as performing the analysis on five or one percent of all cited references of the input papers (Kuntner & Teichert, 2015; Mc Cain, 1990; Teichert & Schehu, 2010); others apply different absolute minimum citation thresholds (e.g., Hsiao & Yang 2011;

Kunz & Hogreve, 2015; Ramos-Rodríguez & Ruíz-Navarro, 2004). Commonly, authors do not handle more than 200 cited references in their co-citation analyses. In this study, applying the one percent approach seems reasonable considering the aforementioned criteria of interpretability and manageability. This limits the analysis to articles that are cited at least eight times within the source documents and rounds up to 86 articles that represent the ‘co-citation sample’.

Counting the co-citations between the relevant papers results in compiling the co-citation matrix. This matrix is squared symmetric with the 86 analyzed papers stated both as rows and columns. Following White and Griffith (1981), the diagonal cells are computed by dividing the sum of the three highest values in the columns by two. The off-diagonal cells represent the actual co-citations for every pair of cited references. In order to prevent an overrepresentation of highly cited documents, these frequency values need to be standardized e.g., by using the Pearson correlation coefficient (White & McCain, 1998; e.g., Teichert & Schehu, 2010) or by using the co-citation score “CoCit” between two articles A and B (Gmür, 2003; e.g. Schildt, Zahra, & Sillanpää, 2006) which this study draws on:

$$CoCit_{AB} = \frac{(Co - citation_{AB})^2}{Min(Citation_A; Citation_B) * Mean (Citation_A; Citation_B)}$$

Statistical analysis techniques such as (exploratory) factor analysis, multidimensional scaling (MDS), and cluster analysis help classifying and graphically representing different research streams within the field of PO (McCain, 1990). Thereby, factor analysis aggregates the co-cited documents into a reduced set of factors that represent the different research streams; their factor loadings indicate their representativeness for the respective discourse (Kuntner & Teichert, 2015; Nerur, Rasheed, & Natarajan, 2008). Articles with factor loadings above .7 are said to be highly relevant for the respective discourse (McCain, 1990; Nerur et

al., 2008). Complementary, the co-citation documents' consolidation into is graphically depicted by means of an MDS. In order to ensure interpretability, the MDS is set up in two dimensions (McCain, 1990) in which highly co-cited documents are also closely arranged. Articles that are central to the respective research field are also centrally located in the MDS whereas more peripheral articles lie on the graph's margins. Complemented by hierarchical clustering using Ward's method, sets of articles constituting major themes in PO research can be circled in the MDS' output.

Results Co-Citation Analysis

Factor Analysis

Consistent with other bibliometric studies (e.g., Galvagno & Dalli, 2014; Kuntner & Teichert, 2015; Teichert & Shehu, 2010), this co-citation analysis starts with exploratory factor analysis (PCA) in order to aggregate the co-citation data into research streams of PO. The factor extraction relies on the Kaiser criterion with Varimax rotation suppressing factor loading lower than .04 (in line with Kuntner & Teichert, 2015; Small, 1973). The initial solution with 15 factors, however, revealed cross-loadings, single loaders, and factors consisting of only two documents. Hence, for the sake of better interpretation, 14 documents were deleted. Yet, four articles (Brown, Lawrence, Robinson, 2005; Furby, 1978, Pierce & Jussila, 2010, and Peck & Shu, 2009) were retained. Despite rather high cross-loadings on other factors, these articles have high citation scores above the upper quartile of 23 citations indicating high relevance for psychological ownership research. This reduction from 86 to 72 analyzed documents is now maintained in the subsequent analyses.

Re-running PCA results in 12 factors albeit none of the articles loads on the last factor after factor rotation and only two documents, i.e., Franke, Schreier, and Kaiser (2010) and Peck and Shu (2009) load on the eleventh factor. This leads to a second re-run of the PCA restricting the number of factors to 10. These ten extracted factors explain 80.98 percent of variance. Communalities show satisfactory levels (ranging from .526 to .964; *mean* = .81; *SD* = .098). Cronbach's alphas all exceed the threshold of .7 suggesting high internal consistency. In sum, the factor solution (see **Table 2** for a general overview) seems quite promising to structure the research field of PO.

Table 2: Research Stream Overview

Factors	Eigen-value	Variance explained (in %)	Cronbach's α	n	Publication year	Citation frequency
					Mean (SD)	Mean (SD)
Factor 1: Construct development/ work outcomes	19.76	27.44	.963	18	2002 (6.58)	52 (49.9)
Factor 2: Possessions	9.54	13.25	.950	14	1975 (25.4)	24 (19.6)
Factor 3: Endowment effect	7.95	11.05	.971	10	1996 (14.9)	14 (5.8)
Factor 4: Marketing application	4.36	6.06	.844	6	2010 (5.9)	15 (9.0)
Factor 5: Family firms' peculiarities	3.82	5.31	.903	4	2002 (4.1)	11 (2.9)
Factor 6: Employee stock ownership	3.33	4.62	.899	4	1987 (6.0)	11 (1.7)
Factor 7: Territoriality	3.00	4.16	.869	4	2009 (3.1)	20 (16.6)
Factor 8: Control	2.77	3.84	.891	5	2012 (2.3)	12 (3.1)
Factor 9: Organizational identification	2.01	2.79	.833	4	1994 (4.6)	11.00 (4.7)
Factor 10: Organizational citizenship behavior	1.69	2.34	.862	3	1995 (10.4)	10 (1.5)
Overall sample				72	1996 (17.8)	25 (31.0)

In the following, each factor is described in detail in order to present its contributing articles and their main findings.

Factor 1 consists of 18 documents and accounts for 27.44 percent of explained variance (refer to Table 3). It describes how the construct PO is derived in theory.

Table 3: Factor 1: Discourse on the Construct Development of PO and its Relation to Work

Outcomes

Article	Year	Journal	FL	Citations		
				This Study	SSCI	Google Scholar
Van Dyne & Pierce	2004	Journal of Organization Behavior	.916	127	240	932
Pierce & Rodgers	2004	Group & Organization Management	.912	22	35	164
Pierce et al. (2009)	2009	Journal of Organizational Behavior	.873	24	50	187
Mayhew et al.	2007	Journal of Social Psychology	.869	45	57	240
Pierce et al. (2001)	2001	Academy of Management Review	.862	173	411	1447
Avey et al.	2009	Journal of Organizational Behavior	.861	67	108	472
O'Driscoll et al.	2006	Group & Organization Management	.849	40	70	244
Pierce et al. (2004)	2004	Journal of Social Psychology	.826	55	70	303
Pierce et al. (2003)	2003	Review of General Psychology	.823	147	303	988
Vandewalle et al.	1995	Group & Organization Management	.793,	69	97	373
Paré et al.	2006	Journal of the American Medical Informatics Association	.779	8	88	232
Higgins	1997	American Psychologist	.764	11	2317	5733
Pierce et al. (1991)	1991	Academy of Management Review	.716	70	180	715
Van Dyne & LePine	1998	Academy of Management Journal	.671	10	788	2278
Pierce & Jussila	2010	Journal of Organizational Behavior	.636	27	54	176
Rousseau & Shperling	2003	Academy of Management Review	.583	21	81	305
Podsakoff & Organ	1986	Journal of Management	.581	12	5798	11944
Asatryan & Oh	2008	Journal of Hospitality & Tourism Research	.532	10	28	81

Vandewalle, Van Dyne, and Kostova (1995) as one of the first papers in this study explicitly drawing on the PO concept to predict employees' extrarole behavior and

organizational commitment. Relatedly, *Van Dyne and LePine's* article (1998) does not deal with PO directly but presents the importance of extra-role behavior that is usually the examined work outcome of interest in later PO studies. Likewise, *Pierce et al. (2001)* conduct a qualitative study using self-reports (discussed in *Podsakoff & Organ, 1986*) to infer its motives and distinctiveness from related concepts such as commitment and identification which is also part of the extensive literature review these authors published two years later (*Pierce et al., 2003*). *Van Dyne and Pierce (2004)* find additional explanatory power in PO for organization-based self-esteem and organizational citizenship behavior apart from job satisfaction and organizational commitment. *Pierce and Jussila (2010)* extend the concept of PO that has been developed for individuals to collective PO, for example in teamwork settings.

Pierce, Rubenfeld, and Morgan (1991) show how PO develops in formal employee ownership forming a variety of employee attitudes and behavior. *Rousseau and Shperling (2003)* discuss how employee ownership translates into a simultaneous psychological contract. In addition, *Pierce and Rodgers (2004)* describe the added value emerging in employee ownership questioning previous operationalization of ownership as it cannot fully explain increased employee performance.

Higgins (1997) develops the concept of regulatory focus that is further distinguished in promotion- and prevention-focus. This concept is adapted to PO by *Avey et al. (2009)*. They decompound PO in both forms: promotion-focused PO including dimensions of self-efficacy, accountability, sense of belonging, and self-identity and prevention-focused PO with its territoriality dimension. In a similar vein, *Mayhew, Ashkanasy, Bramble, and Gardner (2007)* differentiate between organization-based PO, i.e., feelings of ownership for the organization in general, and job-based PO, i.e., feelings of ownership for a particular job, predicting job satisfaction and organizational commitment.

O'Driscoll, Pierce, and Coghlan (2006) find PO to mediate the connection between work environment that relates to the routes of PO and citizenship behavior and commitment. In addition, *Pierce, Jussila, and Cummings (2009)* add PO to job design literature. *Pierce, O'Driscoll, and Coghlan (2004)* more closely look at control as one of PO's routes. Lastly, *Paré, Sicotte, and Jacques (2006)* examine how physicians adopt new IT systems and find PO to positively influence the perception of the system's usefulness which in turn increases its acceptance and usage. *Asatryan and Oh (2008)* use PO in the service context deriving its consequences. In addition, they develop a PO scale which might explain its belonging to the first instead of the fourth factor (marketing application).

The second factor (see Table 4) including 14 articles and accounting for 13.25 percent of the variance deals with research on role of possession laying the foundation for PO. All of the articles were published before the emergence of the term ‘psychological ownership’ and hence, none of the above articles refers to the concept directly. As such, this factor rather constitutes a precursor for the development of the PO construct.

Table 4: Factor 2: Discourse on Possessions as an Origin of PO

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Cram & Paton	1993	Australian Journal on Aging	.898	12	-	76
Porteous	1976	Geographical Review	.877	25	103	385
Nuttin	1987	European Journal of Social Psychology	.863	15	178	401
Litwinski	1947	Philosophy	.862	13	-	44
Kline & France	1899	Pedagogical Seminary & Genetic Psychology	.857	9	-	56
Prelinger	1959	Journal of Psychology: Interdisciplinary and Applied	.851	8	56	171
Furby (1980)	1980	Political Psychology	.812	21	-	182
Beggan	1992	Journal of Personality and Social Psychology	.809	41	306	754
Furby (1991)	1991	Journal of Social Behavior & Personality	.775	17	31	134
Bandura	1977	Psychological Review	.742	8	16072	63074
Etzioni	1991	Journal of Social Behavior and Personality	.720	32	45	178
Belk	1988	Journal of Consumer Research	.654	78	2535	9292
Furby (1978)	1978	Journal of Social Behavior and Personality	.625	46	122	386
McCracken	1986	Journal of Consumer Research	.579	14	922	3287

Litwinski (1947) presents possessions as an innate human need and discusses (im-)materiality of possessions and possessive indicators such as “mine.” Likewise, *Prelinger (1959)* investigates the core of “the self.” *Belk (1988)* illustrates how possessions become part of the self, reflecting one’s own identity. *Cram and Paton (1993)* add to the possession-identity link. With increasing age, possessions serve as an archive of past self-identity. *Porteous (1976)* relates to PO’s motive of having a place treating home as a sign of identity which also corresponds to possessions. Similarly, *Bandura (1977)* outlines the concept of self-efficacy which also addresses a motive of PO, efficacy and effectance.

Beggan (1992) presents his often used term of “mere ownership effect” stating that ownership of an object leads to a psychological bond to the object resulting in better evaluation. *Nuttin (1987)* find the mere ownership effect for alphabetic letters building one’s own name. *Furby (1991)* provides a literature review on the role and motivation for possessions and describes their role from childhood to adulthood (*Furby, 1980*). In addition, she depicts the importance of effectance/ control of possessions and their positive affect throughout all age groups and cultures (*Furby, 1978*). *Etzioni (1991)* divides property into symbolic and real property relating to collective and individualistic possessions. *McCracken (1986)* shows the on-going change in meaning of goods circling from culture to the object to the self.

The third factor (see Table 5) illustrates the relation of psychological ownership and the endowment effect that describes the discrepancy in valuation between owners and non-owners. Containing 10 articles, the factor covers 11.05 percent of the variance

Table 5: Factor 3: Discourse on PO's Role in the Endowment Effect

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Strahilevitz & Loewenstein	1998	Journal of Consumer Research	.949	20	453	139
Carmon & Ariely	2000	Journal of Consumer Research	.942	11	530	192
Thaler	1980	Journal of Economic Behavior & Organization	.936	23	5852	1749
Kahneman et al. (1990)	1990	Journal of Political Economy	.932	18	1403	4429
Kahnemann et al. (1991)	1991	Journal of Economic Perspectives	.921	12	4829	1447
Lerner et al.	2004	Psychological Science	.917	9	984	382
Becker et al.	1964	Behavioral Science	.902	8	848	2233
Reb & Connolly	2007	Judgment and Decision Making	.863	19	63	176
Morewedge et al.	2009	Journal of Experimental Psychology	.820	8	83	208
Dommer & Swaminathan	2013	Journal of Consumer Research	.592	9	30	84

Factor 3 includes the two pioneer articles by *Kahneman, Knetsch, and Thaler (1990; 1991)* describing the (monetary) overvaluation of owners drawing on *Thaler's (1980)* findings

on consumers' choice biases and the valuation measurement via the BDM-mechanism (*Becker, DeGroot, & Marschak, 1964*). The other articles find boundary conditions and alternative explanations (compared to loss aversion) of the endowment effect:

- (1) the duration of ownership (*Strahilevitz & Loewenstein, 1998*),
- (2) the focus on additional value that comes with owning an object (*Carmon & Ariely, 2000*),
- (3) emotions such as disgust and sadness (*Lerner, Small, & Loewenstein, 2004*), and
- (4) ownership (*Dommer & Swaminathan, 2013; Morewedge, Shu, Gilbert, & Wilson, 2009; Reb & Connolly, 2007*).

Although *Morewedge et al. (2009)* describe the link between owned objects and one's self, they do not use the concept of PO. Yet, researchers in PO frequently connect their research with this article indicating its relevance in coupling PO and the endowment effect. Factor loadings for *Dommer and Swaminathan (2013)* are below the threshold of .7. Still, based on its content, its integration in the third factor fits well to the factor solution.

The fourth factor (see Table 6) aggregates articles on the application of the PO concept in marketing research (accounting for 6.06 percent of variance).

Table 6: Factor 4: Discourse on PO's application in marketing

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Fuchs et al.	2010	Journal of Marketing	.931	20	320	111
Jussila et al.	2015	Journal of Marketing Theory and Practice	.861	15	69	24
Karahanna et al.	2015	Journal of Marketing Theory and Practice	.834	8	39	17
Franke et al.	2010	Management Science	.668	9	497	180
Peck & Shu	2009	Journal of Consumer Research	.637	31	131	407
Nesselroade et al.	1999	Psychology & Marketing	.531	9	78	36

Jussila et al. (2015) present a literature review on this aspect. Moreover, *Karahanna, Xu, and Zhang (2015)* connect social media use to the three different motives of PO. *Fuchs et al. (2010)* examine the influence of PO in the new product development when integrating customers into the decision-making. Customers then feel greater PO resulting in better product evaluations. In similar vein, *Franke et al. (2010)* find PO in mass customization and argue that feeling as the creator of a product leads to higher valuation.

Peck and Shu (2009) show that both the imagination as well as actual touch of an object results in the mere ownership effect. Likewise, *Nesselroade, Beggan, and Allison (1999)* extend the mere ownership effect showing that owners like their possessions more

once they own them and simultaneously evaluate others' possessions worse. The relatively low factor loadings and thus, low representativeness for the factor might stem from their relation to the findings of the second factor, especially Beggan's (1992) mere ownership effect.

Factor 5 (5.31 percent explained variance, Table 7) comprises four articles associated with the particularities of family owned firms that research has connected with PO (e.g., Bernhard & O'Driscoll, 2011; Henssen et al., 2014; Ikävalko et al., 2008). However, the covered articles do not express a direct link to PO but are the standard articles in family business research.

Table 7: Factor 5: Discourse on family firms' peculiarities

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Astrachan et al.	2002	Family Business Review	.882	9	-	1344
Gómez-Mejía et al.	2007	Administrative Science Quarterly	.877	13	1814	794
Chua et al.	2003	Family Business Review	.818	8	-	500
Davis et al.	1997	Academy of Management Review	.775	14	4482	1067

Astrachan, Klein, and Smyrniotis (2002) provide a measurement scale on the extent and dimensions of family influence in family owned firms. *Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, and Moyano-Fuentes (2007)* challenge the notion of family owned firms' higher

risk aversion compared to publicly owned firms. *Chua, Chrisman, and Sharma (2003)* identify two major concerns of family firms: succession and the relationship with non-family managers. Relatedly, *Davis, Schoorman, and Donaldson (1997)* derive factors that lead to stewardship of managers for the organization, i.e., a pro-organizational behavior that is motivated by PO (Henssen et al., 2014).

Four articles dealing with employee (stock) ownership set up the sixth factor with 4.62 percent of explained variance (see Table 8). Similar to the previous factor, none of the articles cover PO directly.

Table 8: Factor 6: Discourse on the PO-Related Concept of Employee Stock Ownership

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Klein	1987	Journal of Applied Psychology	.894	13	103	353
Long	1978	Human Relations	.890	10	82	251
Buchko	1992	Work and Occupation	.877	9	17	59
Eisenhardt	1989	Academy of Management Review	.785	10	3160	13281

Klein (1987) and *Long (1987)* both find an increase in employee attitudes, organizational performance, organizational commitment, and turnover intentions when employees own stocks in their firms. In a similar vein, *Buchko (1992)* shows higher employee satisfaction levels due to greater perceived impact and financial benefits. More general, *Eisenhardt (1989)* reviews literature on agency theory. However, as employee ownership can

serve as a solution for agency problems within organizations, this document logically fits to this topic.

The seventh factor (see Table 9) corresponds to territoriality of employees- a concept that is based on psychological ownership relating its root of having a place (*Brown et al., 2005*).

Table 9: Factor 7: Territoriality

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Brown & Robinson	2011	Organization Science	.893	10	22	48
Brown	2009	Journal of Environmental Psychology	.862	8	33	87
Baer & Brown	2012	Organizational Behavior and Human Decision Processes	.846	17	28	85
Brown et al. (2005)	2005	Academy of Management Review	.639	44	116	382

Employees tend to claim objects, ideas, or physical spaced as theirs leading to defensive reactions (*Brown & Robinson 2011*). Relatedly, *Baer and Brown (2012)* examine the role of psychological ownership in externally induced change revealing both positive and negative (territorial) effects.

Accounting for 4.16 percent of the variance, this factor only noticeably contains four documents all (co-)authored by Graham Brown. This might be a sign of self-citations. However, as he is one of the first researchers developing this concept (*Brown et al. 2005*) and its measurement (*Brown 2009*), his work has apparently rather become a standard to cite

when researchers deal with PO and territoriality. To put in perspective, citations of his fundamental article in the *Academy of Management Review* (Brown et al. 2005) stem from other researchers at 85 percent. Compared to its rather high citation counts in the initial set of PO articles, the lower factor loading of .639 might be an indicator for its relevance to other research fields (Galvagno & Dalli, 2014) among PO research and not exclusively distinct for territoriality research.

The eighth factor includes articles that examine control as a path to PO emergence and explains 3.84 percent of the variance (see Table 10).

Table 10: Factor 8: Discourse on Distribution of Control as a Route to PO

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Liu et al.	2012	Journal of Management Studies	.783	11	21	80
Chi & Han	2008	Journal of Occupational and Organizational Psychology	.722	16	22	121
Sieger et al. (2013)	2013	Journal of Management Studies	.718	8	23	70
Sieger et al. (2011)	2011	Journal of Family Business Strategy	.634	13	-	104
Brown et al. (2014)	2014	Journal of Organizational Behavior	.599	10	21	72

Liu, Wang, Hui, and Lee (2012) assess the relationship between control and PO as well as the moderating effect of power distance. In addition, *Chi and Han (2008)* find organizational justice to moderate the link between PO and formal ownership programs such as profit sharing, decision-making, and information access which all include control aspects. Relatedly, *Sieger, Zellweger, and Aquino (2013)* show the mitigating effect of PO on agency problems in general. Moreover, *Sieger, Bernhard, and Frey (2011)* investigate how non-family employees' perception of justice in the distribution of control and PO influence their commitment and job satisfaction. This document's loading falls slightly below the threshold of .7 which might be due its setting in family firms that also contributes to the sixth factor (family firms' peculiarities). The same holds true for *Brown, Pierce, and Crossley (2014)* who closely look at the three routes, i.e., mechanisms of emergence, of PO in which control is one of them. Although this aspect is rather general, other researchers have quite often cited this article with articles that relate to the specific route of control.

Factor 9 (2.79 percent of explained variance; Table 11) relates to the discourse on organizational identification. Yet, all four articles were published before the emergence of PO research. Thus, none of the above articles refers to PO signaling organizational identification as being an adjacent theme that is often discussed when dealing with PO (apparent in the description of factor 1's general findings).

Table 11: Factor 9: Discourse on the PO-Related Concept of Organizational Identification

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Bergami & Bagozzi	2000	British Journal of Social Psychology	.848	9	593	1638
Dutton et al.	1994	Administrative Science Quarterly	.811	9	1598	5389
Mael & Ashforth	1992	Journal of Occupational Behavior	.734	8	1565	4703
Ashforth & Mael	1989	Academy of Management Review	.728	18	3159	10405

Ashforth and Mael (1989) derive a definition of the construct of organizational identification (perceived oneness with the organization) and differentiate it from related aspects such as commitment and internalization. Building on that, *Mael and Ashforth (1992)* develop an operationalization model. *Dutton, Dukerich, and Harquail (1994)* add a model on the influence of inside and outside image of the firm on identification. Finally, *Bergami and Bagozzi (2000)* closely look at identification's different dimensions developing a scale for cognitive organizational identification.

All three articles in the tenth factor (2.34 percent of explained variance, Table 12) examine the concept of organizational citizenship behavior in detail. However, like in factor 9 (organizational identification), none of them directly concerns PO. Yet, as PO has been examined as a predictor of many work outcomes such as organizational citizenship behavior (Van Dyne & Pierce 2004), citations of this set of articles within PO research seems logical.

Table 12: Factor 10: Discourse on the PO-Related Concept of Organizational Citizenship Behavior

Article	Year	Journal	Factor Loading	Citations		
				This Study	SSCI	Google Scholar
Podsakoff et al.	2000	Journal of Management	.803	11	1619	5805
LePine et al.	2002	Journal of Applied Psychology	.762	10	691	1994
Smith et al.	1983	Journal of Applied Psychology	.693	8	1186	4623

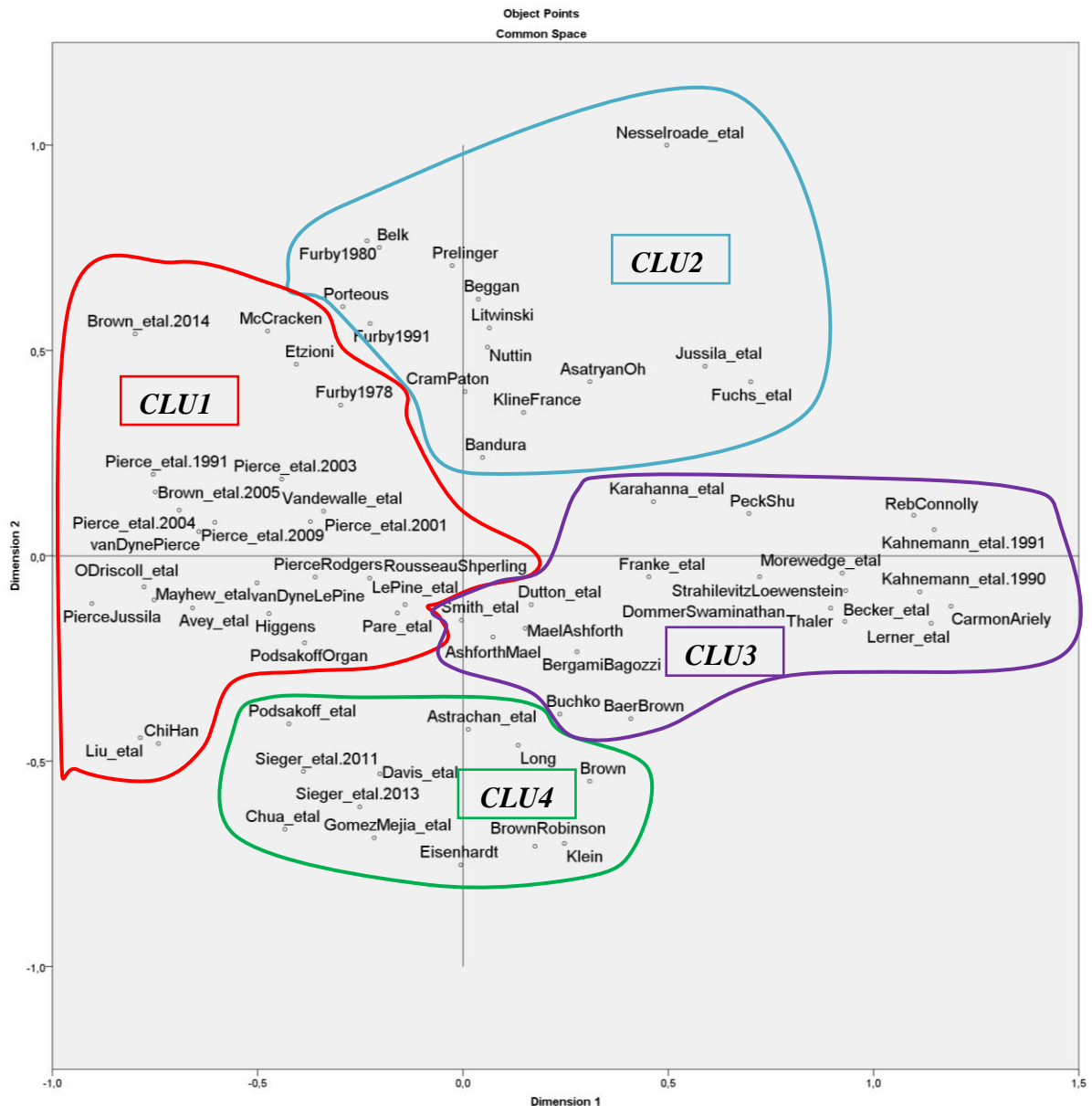
The fundamental article of *Smith, Organ, and Near (1983)* thoroughly discuss the citizenship's antecedents and dimensions. *Podsakoff, MacKenzie, Paine, and Bachrach (2000)* provide a content-based literature review. *LePine; Erez, and Johnson (2002)* conduct a meta-analysis to investigate the interplay between OCB dimensions and often used predictor variables such as job satisfaction and organizational commitment.

MDS and Cluster Analysis

Following McCain (1990), the results of the MDS and Cluster Analysis are combined. For the sake of interpretability, the MDS (see Figure 2) visually aggregates the documents in a two dimensional space and the documents' cluster membership is outlined in the graph. This study uses the PROXSCAL routine of MDS yielding a solution whose goodness-of-fit meets the threshold proposed by McCain (1990) of .2 (Stress I = .1994). In addition, the two dimensions' coordinates are used for a subsequent hierarchical cluster analysis using Ward's method which has been regularly employed in previous co-citation analyses (e.g., Acedo &

Casillas, 2005; Galvagno & Dalli, 2014; Hsiao & Yang, 2011). Both analyses use squared Euclidean distance measures and standardization from -1 to 1.

Figure 2: MDS Including Cluster Analysis



The MDS axes' construction is subjective (Acedo & Casillas, 2005; Galvagno & Dalli, 2014). Yet, based on content considerations and the documents' positions, the horizontal axis seems to refer to an outward orientation of PO since documents on the left side are mostly initial research of employees' PO whereas on the right side of the graph, documents deal with

consumers' responses. The vertical axis seems to represent the shift from research on antecedents to special applications of the PO concept. On the upper part of the graph, documents concern the role of possessions. Moving to the center, the articles are also the central ones on the concept's definition both in employee and marketing contexts. In the bottom, the documents deal with special fields of (psychological) ownership like control or family firms.

This also translates into the cluster formation indicated in the MDS graph. Based on the dendrogram (see Table A1 in the appendix) and content considerations, creating four clusters appears to reasonably aggregate the different documents. Employing the variance ratio criterion (Caliński & Harabasz, 1974) supports this decision on the number of clusters.

Cluster 1 resembles factor 1 reflecting articles that have developed the concept in employee behavior. Finding bridges in Furby (1978) and Etzioni (1991), cluster 2 describes the concept's deduction from articles that deal with the role of possessions. Similarly, Jussila et al. (2015) and Fuchs et al. (2010) connect cluster 2 and cluster 3. The third cluster contains articles on the outcomes of PO such as identification, organizational citizenship behavior, and product liking. Again, on the margin of this cluster, Buchko (1992) spans to the neighboring cluster 4 which includes documents of different PO contexts such as employee ownership or family firms.

Discussion

So far, three expert, content-based literature reviews on PO research help to assess the state of art. However, all of them are restricted to a certain research realm (PO in organizations in Pierce et al. (2003) and Dawkins et al. (2015) opposed to PO in marketing in Jussila et al. (2015)). Hence, it is worth examining the structure of the field in a broader, quantitative way by applying bibliometrics. In performing a co-citation analysis, this study recognizes the most influential articles as well as revealing an intellectual structure within these articles.

Results of exploratory factor analysis indicate ten research streams that can be classified both in terms of an inward-outward orientation and in an antecedent-outcome research focus:

- (1) Concept development/ work outcomes,
- (2) Role of possessions
- (3) PO's role in the endowment effect
- (4) PO's application in marketing strategies
- (5) Family firms' particularities
- (6) Employee ownership
- (7) Territoriality
- (8) PO's route of control
- (9) Organizational identification
- (10) Organizational citizenship behavior

To put these findings in perspective, Pierce et al. (2003) structure their seminal review in first, deriving PO's definition (comparable to this study's factor 1 and 2), then moving on to the roots and routes to PO (which is also reflected in factor 7 and 8), and concluding in the effects of PO such as citizenship behavior, among others, (which is also the topic of factor 10). As many PO research articles draw on Pierce et al. (2003) establishing it as a foundational paper in PO research, it does not cover subsequent developments such as its

application in the marketing context. In that vein, Jussila et al. (2015) follow the structure provided by Pierce et al. (2003) but add findings of marketing studies on PO. Hence, they also draw on studies comprised in factor 1, 2, 7, and 8 in addition to factor 4. Surprisingly, they do not consider the endowment effect (factor 3) in their review which is often associated with PO in consumer studies. Lastly, Dawkins et al. (2015) focus on employee's PO and especially its measurement. Thus, their approach in reviewing PO research is not intended to be holistic. However, in their elaboration on the shortcomings of present measurements, they also mention the link to employee ownership (as factor 6) and family firms (factor 5). Based on the upper comparisons, this co-citation analysis offers a domain-free overview on PO research with its major research streams.

Nevertheless, research in PO seems to not have yet reached maturity as other targets of bibliometric studies - indicated by adjacent research topics like organizational citizenship behavior or employee ownership that do not deal with the concept of PO directly. Previous bibliographic studies did not encounter this phenomenon. In fact, 36 out of the initial 86 (42 percent) documents in the co-citation set do not directly refer to PO. However, in 2018 the SSCI renders 46 articles that include PO in their keywords indicating the ongoing spread of PO in research. Hence, it might be worth to rerun the analysis in a couple of years opening additional research avenues that have not yet received attention expressed in citations.

Any (co-)citation analysis faces several inherent limitations. In line with the proposed theoretical procedure by McCain (1990) and Small (1973) that is also adopted by the majority of researchers applying co-citation analyses (e.g., Kunz & Hogueve, 2011; Ramos-Rodríguez & Ruíz-Navarro, 2004; Teichert & Shehu, 2010), this study only refers to the references of the input articles. There is no distinction in the citation frequency within the papers (Kunz & Hogueve, 2011). A differentiation between often-cited articles and single-mentioned articles actually could deliver additional input in intellectual ties drawn by the citing researchers. Yet, this form of citation weighting highly increases the analysis effort. Moreover, although only

playing a minor role, there is no distinction made according journals' ranking or prestige mostly due to unclear weighting schemes (Garfield, 1979). In addition, bibliometric studies do not consider the valence nor the motives of citations (Kunz & Hogreve, 2011; Stremersch, Verniers, & Verhoef, 2007; Ramos-Rodríguez & Ruíz-Navarro, 2004), i.e., whether the citations is used to foster the researchers' own argumentation or to criticize the respective cited articles or in order to increase the researcher's citation rates (self-citations). Yet, a dramatic, unnoticeable inflation due to self-citations is very unlikely (Garfield, 1979). It would require frequent publishing and, considering the review system of almost any journal, this would eventually lead to downgrade to conspicuous journals.

A more severe problem that a co-citation analysis cannot compensate is obliteration, i.e., an article becomes common knowledge so that authors omit to cite it (Garfield, 1979; Ramos-Rodríguez & Ruíz-Navarro, 2004). In that case, citations constitute only an inferior proxy for measuring the contribution to the research field.

Moreover, (co-)citation analyses are not time sensitive: newer articles are seldomly included in the analyses, as they are usually not yet cited very often (Garfield, 1979). Latest developments or trends are therefore neglected. However, when understanding citations as impact rather than quality, newer articles just did not have enough time to have an important bearing on a whole stream of research (Ramos-Rodríguez & Ruíz-Navarro, 2004).

Lastly, a co-citation analysis renders a quantitative view on a research topic. Still, it also comprises some subjectivity when manually screening and selecting of the initial set of articles whose references are analyzed (Ramos-Rodríguez & Ruíz-Navarro, 2004).

Despite these limitations, co-citation still offers a more objective analysis on the development of PO research than common expert literature reviews. Hence, this study constitutes a useful supplement that enhances assessing the status quo in PO research helping both academics and managers to evaluate research findings and to keep PO's effects on both employees and customers in mind.

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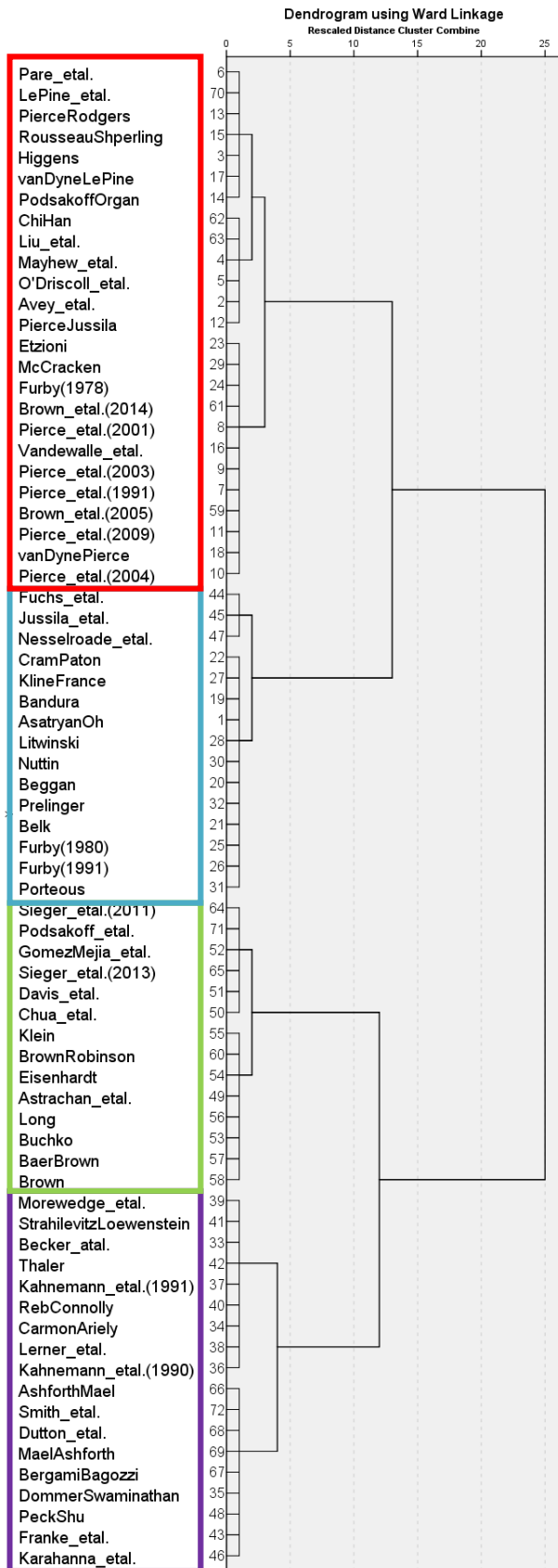
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Appendix A

Figure A 1: Dendrogram Cluster Analysis Based on MDS Dimensions



Essay 2

Examining the Role of Psychological Ownership and Feedback in Customer Empowerment Strategies

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Examining the Role of Psychological Ownership and Feedback in Customer Empowerment Strategies

Abstract

Customers increasingly seek to engage with companies by actively taking part in the value creation process. Companies have reacted to this trend by integrating customers into product development processes in an effort to better fulfill their needs and simultaneously decrease costs. While research has explored various antecedents and consequences of such co-creation activities, only little is known about psychological ownership's role and its interaction with peer feedback. This research shows that psychological ownership emerges when customers engage with companies in creating the product portfolio. Furthermore, implementing feedback loops accelerates customer engagement's positive effects in terms of product evaluations and customers' willingness to pay. Negative feedback reverses these effects suggesting that companies should pay close attention to feedback options when integrating customers into value creation processes.

Keywords:

Value co-creation, customer empowerment, psychological ownership, peer feedback

Introduction

'You are Threadless. You make the ideas, you pick what we sell, you're why we exist.'

Threadless' company philosophy represents the idea behind customer co-creation, specifically customer empowerment: integrating customers into the value creation process (i.e., customer co-creation) by giving them control and decision power over the product portfolio (i.e., customer empowerment), especially in new product development (Bugshan, 2015; Fuchs & Schreier, 2011; Prahalad & Ramaswamy, 2004; Saarijärvi, 2012). Threadless invites its customers to submit designs for T-shirts and to evaluate others' designs. Those with the best ratings are produced and sold to the broader market (Ogawa & Piller, 2006). Instead of employing classical market research to infer products that (presumably) meet customers' tastes, Threadless allows its customers to design the products and to determine the product portfolio (Ogawa & Piller, 2006). Threadless is not alone in its efforts to actively involve customers in the value creation process. An increasing number of companies such as McDonald's, Coca-Cola, or FedEx are following this rationale of customer co-creation and empowerment (Fuchs & Schreier, 2011). By transferring some extent of control and responsibility to their customers, these companies seek to better fulfill customers' needs, develop more innovative products, and simultaneously decrease costs, while reducing their business risks (Ogawa & Piller, 2006).

Not surprisingly, customer co-creation has attracted considerable attention among marketing researchers over the past decade. For instance, a large body of research has discussed the paradigm change in value creation from company-centric to customer co-creation (e.g., Ogawa & Piller, 2006; Prahalad & Ramaswamy, 2000; Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004). Other studies have explored options to integrate customers in value creation, for example, via toolkits or virtual customer communities (e.g., O'Hern & Rindfleisch, 2010; Prahalad & Ramaswamy, 2004; Sawhney, Verona, & Prandelli,

2005). In contrast, the consequences of empowering customers have not been researched in greater detail. Specifically, prior research has focused primarily on the impacts of customer integration on satisfaction and loyalty (e.g., Auh, Bell, McLeod, & Shih, 2007; Bendapudi & Leone, 2003; Chan, Yim, & Lam, 2010; Dong, Evans, & Zou, 2008). However, there are few nuanced investigations that go beyond these two consequences of customer empowerment. A notable exception is Fuchs, Prandelli, and Schreier (2010), who examined the consequences of customer co-creation in the context of customer empowerment to select (i.e., asking customers to select from a set of product configurations), using as a framework the concept of psychological ownership, which refers to customers' feelings of possession that are not necessarily connected to physical or legal possession (Pierce, Kostova, & Dirks, 2003). Fuchs et al. (2010) show that psychological ownership plays a crucial role in the context of empowerment to select strategies that facilitate positive customer outcomes such as word-of-mouth. While Fuchs et al. (2010) provide valuable insights into psychological effects of customer empowerment, their study is limited to dyadic company-customer interactions in the context of customer empowerment to select. The roles of other customers and their opinions on co-created products that may affect such interactions remain unexamined.

The shift from traditional value creation to customer co-creation is accompanied by the shift from company-initiated dialog to a forum of ideas and communication (Prahalad & Ramaswamy, 2004; Saarijärvi, 2012), where customers cannot only interact faster and more frequently with the company but also with fellow customers (Prahalad & Ramaswamy, 2004; Sawhney et al., 2005). Yet, prior studies have not considered the role of peer feedback, which may have a significant bearing on customers' attitudes and perceptions of a created product. Ample research on the role of social influence suggests that people may change their opinion when encountering incongruence of their opinion and others' opinions (Cohen & Golden, 1972; Deutsch & Gerard, 1955; Raghunathan & Corfman, 2006). This altered evaluation is motivated by the need to belong (having the same opinion as a signal of bonding and

association) and the need for accuracy (having the same opinion as a signal of a confirmed ‘correct’ opinion) (Raghunathan & Corfman, 2006).

In a large-scale experiment, we address this lack of empirical investigation of the influence of peer feedback concerning the effects of customer empowerment strategies. By implementing feedback loops, we examine whether empowered customers designing a new product are more prone to changes in their evaluations of a brand and a product when receiving feedback on their designs. In addition, we add to the literature by employing an *empowerment to create* strategy as opposed to an *empowerment to select* strategy (Fuchs et al., 2010). Finally, prior research relied on product-related variables with unknown brands. In this research, we examine customers’ perceptions of an established brand where they have the power to co-create the final product portfolio.

We find that a feedback loop changes the attitude toward and intentions related to the created product depending on the nature of the feedback. Positive feedback enhances the positive effect of co-creation, while negative feedback undermines the effect. Furthermore, we find support for a more favorable brand attitude when customers are empowered to create. Finally, we show that this form of value co-creation has a significant influence on the emergence of psychological ownership.

Theory and Hypotheses

Customer Empowerment as a Strategy in a Co-Creation Context

Traditional value creation is seen as a company-led process in which customers assume only a passive role. The distribution of roles in production and consumption is clear-cut: companies produce and create value, while customers only consume the market offerings predetermined by the companies (Saarijärvi, 2012). Although firms have substantively expanded their product portfolio, often they still fail to differentiate themselves from their competitors and fully capture the increasing heterogeneity of customers' needs and wants (Ogawa & Piller, 2006; Prahalad & Ramaswamy, 2004). If consumer inputs are solicited in classical market research, it seldom influences corporate decisions (Prahalad & Ramaswamy, 2004; Sawhney et al., 2005). In recent years, the long established, company-centric value creation process has started to shift to the co-creation of value. Increasingly, value is being created jointly by firms and customers (Prahalad & Ramaswamy, 2004; Saarijärvi, 2012; Vargo & Lusch, 2004). Triggered by the Internet, customers have easier access to a broader range of information and networking opportunities making the markets more transparent and giving voice and power to customers (Bugshan, 2015; Füller, Mühlbacher, Matzler, & Jawecki, 2009; Prahalad & Ramaswamy, 2004; Sawhney et al., 2005). The evolution from company-centric to interactive value creation is referred to as customer co-creation; that is, the integration of customers into the value creation process, thereby giving them a sense of decision power (Fuchs et al., 2010; Prahalad & Ramaswamy, 2004). An increasing number of companies have begun to respond to and make use of this changing customer role, especially in the new product development stage. This shift involves empowering customers to create a company's offerings by suggesting new products (ideas), or empowering them to select which products are produced and marketed (Fuchs et al., 2010; Fuchs & Schreier, 2011).

Although they give decision power to customers, companies can benefit from the loss of power by developing more innovative products that are less costly and risky, and can thus

more closely meet customers' needs and wants (Ogawa & Piller, 2006). At the same time, even customers not taking an active part in the value creation process view companies that empower customers in a more favorable light, regard them as more customer-oriented, and, ultimately, show stronger behavioral intentions in terms of purchase intentions, positive word-of-mouth, loyalty, and corporate commitment (Fuchs & Schreier, 2011). In line with the above, we hypothesize a co-creation effect that positively affects customers' assessments of a product and a brand as well as their word-of-mouth intentions, willingness to pay, and willingness to defend the product in public.

H_{1a}: Customers who are empowered to create show an improved brand attitude compared to non-empowered customers.

H_{1b}: Customers who are empowered to create are more willing to spread positive word-of-mouth than non-empowered customers.

H_{1c}: Customers who are empowered to create feel a greater joy when using the created product than non-empowered customers.

H_{1d}: Customers who are empowered to create are more willing to defend the product in public than non-empowered customers.

H_{1e}: Customers who are empowered to create show a higher willingness to pay than non-empowered customers.

The Emergence of Psychological Ownership in Customer Empowerment Strategies

Originating from the organizational behavior literature, which broaches its role as a predictor of employee attitudes, job satisfaction, and organizational commitment (Van Dyne & Pierce, 2004), marketing scholars have recently begun to transfer the concept of psychological ownership to marketing research (e.g., Folse, Moulard, & Raggio, 2012; Jussila, Tarkiainen, Sarstedt, & Hair, 2015; Reb & Connolly, 2007). *Psychological ownership* entails that individuals consider an (intangible) object as their own, although this sense of possession might not be accompanied by any legal justification (Pierce et al., 2003). Thus, legal ownership is not a necessary condition for psychological ownership to emerge. Individuals may develop feelings of ownership decoupled from legal ownership or indeed be the legal owner of an object without there being feelings of ownership. Furthermore, psychological ownership is both cognitive and affective in nature, encompassing beliefs and thoughts as well as emotions regarding (immaterial) objects (Pierce et al., 2003).

Psychological ownership emerges through three mechanisms (Pierce et al., 2003): (a) exercising control, (b) investing the self into an object, and (c) getting to know an object intimately. Having control over and taking responsibility for an object strengthens feelings of ownership and the connection to that object (Fuchs et al., 2010). Folse et al. (2012) show that psychological ownership can be evoked by ‘psychological ownership message appeals’ (Folse et al., 2012, p. 296) that communicate responsibility for a target or investment in a target, such as ‘YOU have made a difference’ or ‘because of YOU’ (Folse et al., 2012, p. 298). Although participants were not actively engaging in contribution to a target, they assumed a higher level of psychological ownership. To evoke psychological ownership, subjects must perceive themselves as the cause for the outcome (Pierce & Jussila, 2011). By exerting some extent of control over a product portfolio, customers feel as though the decision is theirs (Agarwal & Ramaswami, 1993; Hunton, 1996). Hence, when companies empower their customers by shifting responsibility and influence in the final product portfolio, and actually

follow the decisions made by customers, they can increase their psychological ownership. As Pierce et al. (2003) note, ‘the most obvious and perhaps the most powerful means by which an individual invests himself or herself into an object is to create it’ (Pierce et al., 2003, p. 93). As a result, people develop a strong association to objects they psychologically own and connect them to their self-identity and self-concept (Belk, 1988; Pierce et al., 2003). A large body of research has shown that (feelings of) ownership relate to stronger appreciation, closeness, and liking for the (psychologically) owned product (e.g., Kamleitner, 2015; Kirmani, Sood, & Bridges, 1999; Peck & Shu, 2009).

The finding that ownership leads to a higher valuation for an object than non-ownership is not new. Kahneman, Knetsch, and Thaler (1990) demonstrated the endowment effect, showing that people evaluate the possession of a product higher than obtaining a product (see also Carmon & Ariely, 2000; Kahneman, Knetsch, & Thaler, 1991; Reb & Connolly, 2007; Strahilevitz & Loewenstein, 1998). However, in contrast to psychological ownership, the conceptualization of the endowment effect is based on the valuation discrepancy between loss-averse owners and those aspiring to ownership (Folse et al., 2012). Reb and Connolly (2007) sought to relate psychological ownership to the endowment effect. While their results suggest that the endowment effect ‘may be primarily driven by subjective feelings of ownership rather than by factual ownership’ (Reb & Connolly, 2007, p. 112), they differentiate between legal ownership and physical possession of an object by holding it in one’s hands. Hence, Reb and Connolly (2007) definition of psychological ownership does not fully correspond with the definition by Pierce et al. (2003). Similarly, Peck and Shu (2009) state that perceived ownership is linked to possession and touch. However, according to Pierce et al. (2003), the emergence of psychological ownership is independent from (legal) possession and is connected to the investment of a person’s self into an object. Psychological ownership arises when spending time and effort with an object, independent from any buying decision. In contrast, the endowment effect occurs in purchase settings as the difference

between the seller's willingness to accept a price and the buyer's willingness to pay. As such, psychological ownership might mediate the emergence of the endowment effect.

It thus appears that customers who are empowered to create can travel all three routes to psychological ownership: (a) they exert control over a product portfolio (b) invest themselves in generating a product, and in this way (c) come to know a product intimately, which increases the familiarity and identification with the product during the co-creation process.

H₂: Empowered customers show higher psychological ownership levels toward a self-created product than non-empowered consumers.

The Role of Feedback in Customer Empowerment Strategies

Customer co-creation changes a market from a one-sided communication in which a customer is only a recipient of information selected by a company, to an interaction between customers and companies (Bugshan, 2015; Prahalad & Ramaswamy, 2004). However, this interaction does not occur in a vacuum. Fuchs et al. (2010) found that for empowerment to select strategies, the co-creation effect decreased if the collectively selected product did not match the customers' individual favorites. This finding indicates that the congruence of opinions may play an important role in the co-creation experience.

Marketing research has recognized the influence of others' opinions (Cohen & Golden, 1972; Deutsch & Gerard, 1955; Raghunathan & Corfman, 2006) on, for instance, buying decisions (e.g., Bearden & Etzel, 1982; Cohen & Golden, 1972), the propensity and valence of word-of-mouth (Ryu & Han, 2009), or the self-brand connection (Edson Escalas & Bettman, 2003). Social influence theory suggests that subjects strive to agree with others (Burnkrant & Cousineau, 1975; Cohen & Golden, 1972), which is motivated by two forms of

social influence: the need to belong and the need for accuracy (Deutsch & Gerard, 1955). The former describes a wish or a social norm to identify with others and their evaluations. The latter encompasses a form of informational value—other opinions serve as evident information about a reality (Burnkrant & Cousineau, 1975). Satisfying their need for accuracy, subjects feel confirmed in their own judgments when they are in accordance with others' judgments. However, in case of incongruent opinions, subjects can change their assessment of products solely due to perceived opinions of others—regardless of whether or not they consider these others' judgments to be expert judgments (Raghunathan & Corfman, 2006).

In light of the above, we expect empowered customers designing a new product to be susceptible to changes in their brand and product evaluations when encountering feedback on their designs. We assume that social influence may alter customers' evaluations when facing others' different opinions. Thus, we hypothesize that for empowered customers receiving positive (negative) feedback on their product design, the co-creation effect increases (decreases).

H_{3a}: Positive feedback enhances the co-creation effect for empowered customers; that is, these customers show an improved brand attitude and a higher willingness to pay for the product, feel a greater joy when using the created product, and are more willing to spread positive word-of-mouth and defend the product in public than empowered customers who receive no feedback.

H_{3b}: Negative feedback diminishes the co-creation effect for empowered customers; that is, these customers show a declined brand attitude and a lower willingness to pay for the product, feel lesser joy when using the created product, and are less willing to spread positive word-of-mouth and defend the product in public than empowered customers who receive no feedback.

Consistent with the above hypotheses, we contend that peer feedback influences the psychological ownership level. Bendapudi and Leone (2003) have examined the effect of the self-serving bias on customer satisfaction when customers and firms produce jointly. According to the self-serving bias, the responsibility level people take for a jointly generated outcome depends on the outcome's success (Wolosin, Sherman, & Till, 1973). If the outcome is successful, people assign more responsibility to themselves and ascribe the success to their contribution. If the outcome is negative, they take less responsibility and blame the other party. We contend that the effects of self-serving bias apply when receiving feedback. Positive feedback equals a successful outcome. Hence, a customer would ascribe more responsibility to himself or herself. Since one mechanism to induce psychological ownership is taking control and responsibility for an object, an increase in responsibility leads to an increase in psychological ownership. In contrast, we assume that empowered customers who receive negative feedback take less responsibility for their design and feel lower psychological ownership.

H_{4a}: The psychological ownership level further increases for empowered customers after receiving positive peer feedback.

H_{4b}: The psychological ownership level decreases for empowered customers after receiving negative peer feedback.

Design, Procedure, and Measures

Pretests

The emergence of both the co-creation effect as well as of psychological ownership depends on characteristics of the target product (Pierce & Jussila, 2011). Specifically, the target product needs to be perceived as attractive, accessible, and manipulable (Pierce & Jussila, 2011). We therefore ran a series of focus groups and face-to-face interviews with undergraduate students from a major German university in which we explored the suitability of different product categories and product types. These analyses showed that designing an inlay for a thermos mug meets the above requirements. Next, we ran a pretest in which we simulated the design process using a toolkit, as Thomke and Von Hippel (2002) suggest. Pretest participants who designed a thermos mug exhibited significantly higher psychological ownership levels than those who did not. In light of these results, we deemed the use of thermos mug inlays for our main experiment to be appropriate.

Design

To test our hypotheses, we conducted a laboratory experiment at a major German university in collaboration with an established coffee bar chain located on the campus. A total of 213 undergraduate students participated in the experiment for course credit or a reimbursement of €5. Participants were randomly assigned to the control group or one of three experimental groups. Members of the experimental groups designed a thermos mug inlay but received either no feedback, positive feedback, or negative feedback. Table 1 illustrates the experimental design. The experiment primarily draws on a between-subjects design, with the exception of the analysis of the feedback's effect on participants' willingness to pay in our hypothesis H₃. Here, we draw on the change from the second to the third measurement as a within-subjects analysis of experimental group 2 and 3 respectively.

Table 1: Experimental Set Up

			t ₀	t ₁	t ₂	t ₃	t ₄
Control Group n = 45	<i>Market Research</i>	(R)	O ₁		O ₂		
Experimental Group 1 n = 59	<i>Empowerment</i>	(R)	O ₁	X ₁	O ₃		
Experimental Group 2 n = 56	<i>Positive Feedback</i>	(R)	O ₁	X ₁	O ₄	X ₂ ⁺	O ₅
Experimental Group 3 n = 53	<i>Negative Feedback</i>	(R)	O ₁	X ₁	O ₄	X ₂ ⁻	O ₅

Notes:

R – Random assignment

O₁ – First measurement with buying frequency and attitude towards the product category as control variables; attitude towards the brand, psychological ownership, word-of-mouth-intention (WOM), willingness to defend the product in public; enjoyment of using the product, hypothetical WTP as variables of interest

O₂, O₃ – Second measurement of all variables of interest and demographics

O₄ – Second measurement of hypothetical WTP, demographics

O₅ – Second measurement of all variables of interest, third measurement of hypothetical WTP

X₁ – First treatment: Design of a thermos mug

X₂⁺ – Second treatment: Exposure to feedback, with: + indicating positive feedback and - indicating negative feedback

t – Time

Procedure

Hypotheses H₁ and H₂ were tested drawing on experimental group 1 (EG1; 'Empowerment') and on the control group (CG; 'Market Research'). Specifically, subjects in experimental group 1 (n = 59) took part in the design process, while participants in the control group (n = 45) were asked to participate in a 'market research project on coffee thermos mugs' in which they were asked to help derive the potential market volume for pre-designed thermos mugs. The latter participants were told that the company had already selected the final thermos mug design. As a result, our experimental design clearly distinguishes the control group from any empowerment strategy.

The procedure started with an initial questionnaire (O₁) containing the first measurement of all variables of interest as well as the two control variables of buying frequency and attitude towards the product category. Next, we announced the design process in EG1 and the market research project in CG, respectively. We then measured the subjects'

perceived impacts on corporate decisions, which served as a manipulation check. For an effective manipulation, participants in CG should report a lower level of perceived impact. Afterwards, participants in EG1 designed the thermos mug (X_1), while participants in the control group were asked to rate three pre-designed thermos mugs. Finally, participants in both groups answered the last questionnaire (O_2 in CG and O_3 in EG1), which contained demographics and the second measurement of all variables of interest.

Hypotheses H_3 and H_4 were tested by comparing EG2 ('Positive Feedback') and EG3 'Negative Feedback' to EG1 'Empowerment'. Participants in EG2 and EG3 went through the same initial approach as participants in EG1. Specifically, the process involved obtaining the first measurement of all variables of interest, a co-creation treatment, and then measuring willingness to pay for the second time and demographics. Participants in EG2 and EG3 then received a second treatment containing positive feedback (X_2^+) and negative feedback (X_2^-), respectively. The two sessions ran simultaneously and participants were aware of an experiment in a nearby room to believably communicate this feedback loop. We claimed that the feedback was an online evaluation of the designs that were created by the participants in the nearby room. It means that participants in one room ostensibly rated the designs of the other room, and vice versa. In fact, we manipulated the feedback and randomly assigned the feedback to the participants. Finally, we measured all variables of interest for the second time (O_5) and the willingness to pay for the third time.

Calculating the change from the first to the second measurement of all variables of interest in the positive feedback group (EG2) and the negative feedback groups (EG3), and then comparing it to the changes in the empowerment group EG1 allowed us to isolate the influence of positive (negative) feedback on the co-creation effect. Peer feedback's effect on willingness to pay is examined by a within-comparison of the second and third measurement in each of the feedback groups. If feedback has an influence on the co-creation effect, an increase (decrease) should occur.

Measures

The operationalization of the constructs draws on measures commonly used in prior research. Since all measures denote manifestations of the underlying construct, this study uses reflective items (as opposed to formative ones; Diamantopoulos, Riefler, & Roth, 2008). Most construct measures draw on multi-item scales. In light of the experiment's complexity, two constructs were measured with single items despite known disadvantages with regard to their predictive validity (Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2012; Sarstedt, Diamantopoulos, Salzberger, & Baumgartner, 2016; Sarstedt, Diamantopoulos, & Salzberger, 2016). Table B1 in Appendix B provides an overview of all construct measures.

Results

Control Variables

We employed a chi-square test and analyses of variances (ANOVAs), including post hoc tests, to check whether groups differ concerning their structural composition (Hutchinson, Kamakura, & Lynch Jr, 2000; Lynch Jr, 1982; Sarstedt & Mooi, 2014). First, we found that the four groups do not differ significantly concerning gender and income. Next, and more importantly, there was no evidence of differences in buying frequencies and, thus, usage habits affecting our results. The same holds true for participants' attitudes towards the product category. To summarize, we found no structural differences between the groups.

Manipulation Check

The analysis shows that the treatment was successful, since taking part in an empowerment to create process significantly increased the consumers' perceived impacts on corporate decisions. Participants in CG ($M = 2.78$, $SD = 1.11$) report significantly lower levels of perceived impact on corporate decisions ($p < .001$, $F = 6.844$, $df = 3$, post hoc test) than

participants in EG1 ($M = 3.64$, $SD = 1.22$), EG2 ($M = 3.70$, $SD = 1.38$), and EG3 ($M = 3.67$, $SD = 1.56$).

Main Findings

Our analysis of the change in participants' evaluations of the brand and product-related constructs supports the first set of hypotheses (Table 2). Empowered customers display a significantly more favorable brand attitude than non-empowered customers (H_{1a}). Empowerment to create also significantly enhances the participants' willingness to spread positive word-of-mouth (H_{1b}), their enjoyment when using the product (H_{1c}), their willingness to defend the product in public (H_{1d}), and finally, their willingness to pay (H_{1e}). Analyzing the emergence of psychological ownership during the co-creation process shows that empowered participants exhibit significantly higher psychological ownership levels compared to those in the control group (H_2).

Table 2: The Co-Creation Effect and Increased Psychological Ownership

Change of Dependent Variable	Group	M	SD	t-Value
H_{1a} : Attitude towards the brand	EG1	.14	.46	-1.659*
	CG	-.00	.36	
H_{1b} : WOM	EG1	.95	1.63	3.71***
	CG	-1.22	1.20	
H_{1c} : Enjoyment of using the product	EG1	1.53	1.98	-2.42**
	CG	.67	1.64	
H_{1d} : Willingness to defend the product in public	EG1	1.36	1.77	-3.34**
	CG	.29	1.49	
H_{1e} : Willingness to pay	EG1	3.68	5.01	-4.28***
	CG	-.06	3.45	
H_2 : Psychological Ownership	EG1	1.51	1.83	-5.09***
	CG	-.04	1.27	

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

The final set of analyses examines whether adding a positive (negative) feedback enhances (diminishes) the co-creation effect. Results in Table 3 show that receiving positive feedback when taking part in a co-creation process increases the willingness to pay as well as the willingness to defend the product in public significantly (H_{3a}). In contrast, negative feedback significantly lowers participants' attitudes towards the brand and their willingness to spread positive word-of-mouth (H_{3b}). However, most importantly, negative feedback significantly reduces participants' willingness to pay. Thus, we find partial support for hypothesis H₃. However, in contrast to our hypothesized effect of feedback on psychological ownership, we find no support for hypothesis H₄ – peer feedback does not significantly affect psychological ownership.

Table 3: The Influence of Positive and Negative Feedback

Change of Dependent Variable	Positive Feedback				Negative Feedback			
	Group	M	SD	t-Value	Group	M	SD	t-Value
Attitude towards the brand	EG1	.14	0.46	-.857	EG1	.14	.46	-3.96***
	EG2	.04	.75		EG3	-.20	.45	
WOM	EG1	.95	1.63	-1.32	EG1	.95	1.63	2.16**
	EG2	1.34	1.54		EG3	.33	1.38	
Enjoyment of using the product	EG1	1.53	1.98	-1.12	EG1	1.53	1.98	-.84
	EG2	1.89	1.51		EG3	1.83	1.83	
Willingness to defend the product in public	EG1	1.36	1.77	-1.75*	EG1	1.36	1.77	.39
	EG2	1.96	1.94		EG3	1.23	1.71	
Psychological Ownership	EG1	1.51	1.83	-1.51	EG1	1.51	1.83	.53
	EG2	1.98	1.45		EG3	1.33	1.84	
Dependent Variable	Group	M	SD	t-Value	Group	M	SD	t-Value
Willingness to pay	EG2	1.37	5.43	1.88*	EG3	-.89	3.59	-1.80*

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

Discussion

Summary of Results and Future Research

Customer co-creation and customer empowerment strategies are emerging topics in both marketing practice and research. The shift from traditional value creation to joint value creation of companies and customers encourages consumers to participate in corporate decisions on the product portfolio. However, relatively little is known about the psychological responses of customers actively engaging in customer co-creation processes. Prior research has shown that co-creation settings facilitate positive customer outcomes (Fuchs et al., 2010), which is attributed to an increase in psychological ownership, that is, perceived feelings of possession concerning an (in)tangible object (Pierce et al., 2003).

Our study is the first to consider peer feedback's role in these co-creation settings, thereby addressing the trend of companies allowing open communication among peer customers (Fuchs & Schreier, 2011; Sawhney et al., 2005). In addition, we replicate and extend prior findings by employing an empowerment to create strategy and using an established brand in our experimental setting. We find that customers who are empowered to create report a more favorable attitude towards the brand, enjoy using the co-created product more, and are more willing to spread positive word-of-mouth as well as to pay more. As expected, customer co-creation adds value to the product, as expressed in significantly higher psychological ownership levels. We conclude that managers can rely on both strategies to empower customers in order to respond to the shift in value creation.

Regarding the effects of feedback, this study provides first evidence that managers should be concerned with the possibility of their customers exchanging opinions. We found that receiving positive feedback further increases participants' willingness to pay. However, we could not find support for an increase in brand attitude or willingness to spread positive word-of-mouth. More severely, in case of negative feedback, empowering customers seems to backfire on the company, since the brand attitude diminishes and willingness to pay declines

significantly. We connect feedback's effect to social influence (Raghunathan & Corfman, 2006) and conclude that social influence may have altered the evaluation of the designed product's quality. Our results also suggest that social influence does not affect psychological ownership, as it remains stable in light of positive and negative feedback.

Future Research

Our results show that the co-creation experience 'turns on' psychological ownership. But, is it possible to turn it off? And if yes, how? Thus, the question is: Why is psychological ownership independent from external influences such as feedback? Future research should shed further light on this issue. In line with Fuchs et al. (2010), future research should also analyze the long-term effects of customer empowerment. Never seeing a favorite or a self-created design being part of the finally selected products may also be a form of negative feedback. Similarly, it would be interesting to examine whether receiving no feedback to a design when other customers have received feedback would also be considered to be negative. Our results indicate the necessity to further examine the consequences of feedback, especially negative feedback, in order to fully capture the potential of customer empowerment and to obtain further managerial implications. Finally, future research should examine the influence of further moderators on customer empowerment activities and feedback. For example, considering age-related phenomena, such as subjects' future time perspectives (Carstensen, 2006), that recent marketing research has investigated (Kuppelwieser & Sarstedt, 2014a, b), would be particularly promising in this context.

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Appendix B

Table B1: Overview of Measures

Construct	Items	Cronbach's α	
		1st measurement	2nd measurement
Buying Frequency	<p>'How often do you buy products of [brand name]?' 1= never 2= seldom (once a month) 3= occasionally (several times a month) 4= regularly (once a week) 5= frequently (several times a week)</p>	-	
Attitude towards the brand and product category From: Martin & Stewart (2001); Goldsmith, Lafferty, & Newell (2009)	<p>'My overall impression of the [brand name] is ...' and 'I think thermos mugs in general are ...' bad/ good unfavorable/ favorable unsatisfactory/ satisfactory</p>	.893	.887
Psychological Ownership From: Fuchs et al. (2010) Adapted from Van Dyne & Pierce (2004)	<p>'Although I do not legally own this thermos mug yet, I have the feeling that it is "my" thermos mug.' 'The thermos mug incorporates a part of myself.' 'I feel that this mug belongs to me.' 'I feel connected to this thermos mug.' 'I feel a strong sense of closeness with this thermos mug.' 'It is difficult for me to think of this mug as mine.' (rev.)</p>	.887	.869
Word-of-Mouth-Intention (WOM)* From: Fuchs et al. (2010) Adapted from Caroll & Ahuvia (2006)	<p>'I would recommend the thermos mug to my friends.' 'I would 'talk this mug up' to others.' ('I would try to spread the word about the thermos mug.')</p>	.814	.892
Willingness to defend the product in public From: Fuchs et al. (2010)	<p>'If someone said something bad about the mug, I would be more likely to defend it verbally than other products.'</p>	Single item	

<p>Enjoyment of using the product</p> <p>From: Fuchs et al. (2010)</p>	<p>‘Compared to similar mugs from other firms, it would be more fun to use the thermos mug of the [brand name].’</p>	<p>Single item</p>	
<p>(Hypothetical) Willingness to Pay</p>	<p>‘If the [brand name] decided to launch this thermos mug, would what would you be willing to pay for such a mug?’</p>	<p>-</p>	
<p>Consumers’ perceived impact on corporate decisions</p> <p>From: Fuchs et al. (2010) Adapted from Spreitzer (1995)</p>	<p>‘I see that I have some control in determining which thermos mug will be produced by the [brand name].’ ‘I have some influence in determining which products will be sold by the [brand name].’</p>	<p>.656</p>	<p>-</p>

Essay 3

The IKEA Effect. A Conceptual Replication

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The IKEA Effect. A Conceptual Replication

Abstract

We replicate and extend Norton et al.'s (2012) and Mochon et al.'s (2012) studies on the IKEA effect, according to which consumers show a higher willingness-to-pay when they assemble products themselves. Our results support the robustness of the original effect and indicate that psychological ownership acts as a psychological mechanism that underlies the IKEA effect.

Keywords:

IKEA effect, psychological ownership, replication, pride

Introduction

Norton framed the IKEA effect, according to which consumers show a higher willingness-to-pay when assembling products themselves. Consumers who assembled and then disassembled their creations, or were not permitted to finish those creations, did not show an increase in willingness-to-pay. In a follow-up study, Mochon, Norton, and Ariely (2012, p. 363) further explore the processes that underlie the IKEA effect and conclude that “by building things themselves, people both control and shape their environments, thereby demonstrating their competence to themselves and to others.” That is, by exercising control over an object and thus satisfying their need for effectance, individuals develop a feeling of responsibility for the object. However, since individuals also invest time and effort in the object, we argue that this feeling of responsibility translates into psychological ownership—a personal sense of possession that individuals feel for a material or immaterial target, which prevails even if they do not legally own the product—and that this psychological ownership mediates the relationship between product creation and willingness-to-pay.

In this replication study, we examine the robustness of the IKEA effect and offer evidence for the *mediating* role of psychological ownership. As such, our study extends Walasek, Rakow, and Matthews’ (2017) recent research, which shows that product assembly has a positive effect on psychological ownership. Furthermore, extending Norton et al.’s (2012) and Mochon et al.’s (2012) studies, we examine the IKEA effect in a customer co-creation setting, in which companies empower their customers to design and create new products. Our results show that the IKEA effect also prevails when companies integrate their customers into the value creation process by giving them control and decision power over the product portfolio. We also find that psychological ownership and the IKEA effect dissipate when individuals dissemble their creations. Table C1 in the Appendix C compares the differences and similarities among Norton et al.’s (2012), Mochon et al.’s (2012), and our studies.

Procedure

A total of 103 undergraduate students from a major German university participated in our experiment, for which they each received EUR 5.00. The participants were randomly assigned to one of the experimental groups and asked to participate in a market research project of a jewelry start-up company that was planning to launch loom band bracelets.

Similarly to Norton et al. (2012) and Mochon et al. (2012), the participants in experimental group 1 (EG1) did not receive a treatment but were asked to choose one of three predesigned loom bands and to write an essay about their thoughts and feelings when inspecting the loom band. By contrast, participants in EG2 were invited to assemble a loom band with the help of a toolkit (Figure C1 in the Appendix) and the included assembly instructions (Mochon et al., 2012; Norton et al., 2012). Hence, we replicate the IKEA effect by using a product that offers limited customization options due to the assembly instructions' restrictions. The results from a pretest with 15 participants supported the adequacy of the toolkit and the assembly instructions, showing that assembling a loom band takes a beginner about 20 minutes. To test for structural differences between the experimental groups, we first measured the participants' attitude toward the product category, brand liking, perceived competence to complete the assembly task (in EG1: writing the essay), and the extent to which they would consider themselves "do-it-yourself" people. After either writing the essay or building a loom band, we measured the participants' psychological ownership, pride, demographics, and willingness-to-pay for the loom band by means of the Becker–DeGroot–Marschak (BDM) mechanism. Table C2 (Appendix C) provides an overview of all the construct measures and internal consistency reliabilities.

The participants in EG3 were also asked to assemble a loom band but were told that the start-up company would consider the best designs for batch production, thereby triggering the participants' perception of the impact on corporate decisions (i.e., customer empowerment). The EG4 and EG5 participants designed a loom band as well, but in EG4, a

research assistant interrupted the design process after participants had completed half of the assembly task (incompletion). In EG5, the participants had to disassemble their designs upon completion (destruction). Again, we measured the participants' psychological ownership, pride, demographics, and willingness-to-pay by using the BDM mechanism (Table C2 in the Appendix C). Furthermore, we measured their perception of the impact on corporate decisions, which served as a manipulation check for our empowerment conditions. To ensure that the participants would feel that they had an impact on corporate decisions even if the BDM mechanism rendered their bid payoff relevant, we took photos of the built loom bands and indicated that we would communicate the designs to the start-up company. Table C3 in the Appendix C provides an overview of the study's experimental design.

Summary of Results

First, we tested for structural differences between the experimental groups. Our pre-analyses did not reveal any significant differences between the experimental groups in terms of age, gender, and income ($p > .05$; Table C4 in the Appendix). Similarly, our analyses did not yield any significant differences with regard to their attitude toward the product category (i.e., loom bands), brand liking, perceived competence to complete the assembly task or write an essay, and the extent to which they would consider themselves "do-it-yourself" people ($p > .05$; Table C4 in the Appendix C).

Our replication of the original IKEA effect shows that the EG2 participants offered significantly more money for the loom bands than the EG1 participants (mean difference (MD) = 1.36, $p < .01$; see Table C5 (Appendix C) for group-specific means and standard deviations and Table C7 (Appendix C) for covariances). Furthermore, the EG2 participants reported a significantly higher level of psychological ownership than the EG1 participants (MD = 2.19, $p < .01$; see Table C6 (Appendix C) for group-specific means and standard

deviations and Table C7 (Appendix C) for covariances). The mediation analysis's results (Figure C2 in the Appendix C) indicate that creating an object has a significant indirect effect on participants' willingness-to-pay via psychological ownership ($b = .7628$, 95% BCa CI [.17, 1.46]; $\kappa^2 = .3627$, 95% BCa CI [.0798, .6491]), while the direct effect remains significant. This result suggests a complementary (partial) mediation, which indicates that another mediator, whose indirect path has the same direction as the direct effect, may have been omitted. In contrast to Mochon et al. (2012), we do not find support for pride's mediating role ($b = .0006$, 95% BCa CI [-.095, .120]; $\kappa^2 = .0005$, 95% BCa CI [.000; .0010]; Figure C3 in the Appendix C). Since the direct effect is significant, this result indicates a direct-only (no) mediation.

Our next analyses address the IKEA effect in the context of customer empowerment by using the participants' perceived impact on corporate decisions as a manipulation check. As expected, the EG1 and the EG2 participants report a significantly lower perceived impact than the empowered EG3, EG4, and EG5 participants ($F = 12.734$, $df = 4$, all p -values $< .01$, Hochberg's GT2). We also find support for the IKEA effect in an empowerment context, since the EG3 participants report a significantly higher willingness-to-pay ($MD = 1.77$, $p < .01$) and psychological ownership ($MD = 2.46$, $p < .01$) than the EG1 participants do (Tables C4 and C5 in the Appendix C). In contrast to our expectations, we do not find evidence that empowerment boosts the IKEA effect further, as the empowered EG3 participants report a slightly higher (but not significant) increase in willingness-to-pay ($MD = .41$, $p > .10$) and psychological ownership ($MD = .27$, $p > .10$) than the EG2 participants do.

Our final assessment explores the impact of incompleteness and destruction on participants' willingness-to-pay and psychological ownership. The comparison between EG3 and EG4 shows that failing to complete the creation process leads to a reduced willingness-to-pay and psychological ownership, but that this effect is not significant. By contrast, comparing EG3 with EG5, the destruction of the created products lowers participants'

willingness-to-pay ($MD = -1.40, p < .05$) and psychological ownership ($MD = -1.33, p < .10$) significantly.

Discussion and Limitations

This study replicates and extends Norton et al.'s (2012) and Mochon et al.'s (2012) studies on the IKEA effect. While our results provide evidence for the effect's robustness, they do not support the mediating role of pride. Instead, we find that psychological ownership acts as an underlying mechanism that increases consumers' valuation when they assemble their products themselves. A potential reason for this divergent finding could be the difference in measurement operationalizations of pride. Whereas Mochon et al. (2012) used competence as a proxy for pride, this study draws on Tracy and Robbins's (2007) authentic pride scale. We chose this operationalization because the underlying conceptualization attributes pride to the positive outcomes of specific behaviors. Hence, individuals can affect the cause of pride, which aligns with the concept of psychological ownership (e.g., Kirk, Swain, and Gaskin, 2015). Because of the authentic pride scale's generic nature, however, we cannot rule out that our measure also captured pride in the task, confounding the mediating effect between product creation and willingness-to-pay. Furthermore, our results show that the effect also occurs in a customer empowerment context and that its stability depends on individuals' retention of the created products. The IKEA effect dissipates when individuals disassemble their creations. However, interrupting the creation process does not significantly reduce the IKEA effect in a customer empowerment context.

Future research should explore the role of psychological ownership further by investigating the boundary conditions for its emergence and disappearance in the context of the IKEA effect and co-creation activities in general. For example, future studies should examine the role of time in the emergence of psychological ownership and pride in the product. Evaluating the impact of peer groups would also be promising in this respect, as

feedback likely accelerates or attenuates the emergence of psychological ownership (Fuchs, Schreier, & Prandelli 2010). Finally, recent research shows that affective commitment and identification mediate the relationship between product assembly and product evaluation (Atakan, Bagozzi, & Yoon 2014). Since psychological ownership constitutes an antecedent of commitment and identification, shedding further light on its role in this multiple mediation model would be particularly promising.

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Appendix C

Table C1: Differences and Similarities Between Norton et al. (2012), Mochon et al. (2012) and This Study

		Norton et al. (2012) Mochon et al. (2012)	This study
Experimental context		Co-creation	Customer empowerment as a type of co-creation
Willingness-to-pay	Measurement	Elicitation via incentive compatible BDM mechanism with real transactions	
	Result	Increasing willingness-to-pay for products after investing effort in their creation	
Role of incompleteness and destruction		IKEA effect disappears (i.e., the willingness to pay decreases) Lower levels of psychological ownership	
Perceived competence (only Mochon et al. 2012)	Operationalization	Operationalized via feelings of pride: Average of extent to which individuals feel proud and willing to show off their product	Three items adapted from Fuchs et al. (2010)
	Result	Competence (pride) mediates the IKEA effect	No impact on IKEA effect since no difference between groups
Pride (only Mochon et al. 2012)	Operationalization	Used as proxy for perceived competence	Seven items taken from Tracy and Robbins's (2007) authentic pride scale
	Result	Competence (pride) mediates the IKEA effect	Pride does not mediate the IKEA effect
Do-it-yourself-person	Operationalization	Extent to which individuals consider themselves to be “do-it-yourself” people	
	Result	No impact on the IKEA effect	
Psychological ownership	Operationalization	-	Six items taken from Fuchs et al. (2010)
	Result		Mediating role for the IKEA effect [†]

[†] This result also extends Walasek et al. (2017) who found a positive relationship between product assembly and psychological ownership.

Table C2: Overview of Construct Measures

Construct	Items	Cronbach's α
Attitude toward the product category (Martin and Stewart, 2001)	<p>"I think loom bands in general are ..."</p> <p>...bad / good ...unfavorable / favorable ...negative / positive</p>	.890
Brand Liking (Fuchs et al., 2010)	"I like [brand name]."	Single item
Perceived competence to complete the assembly task (in EG1: write an essay about loom bands) (Fuchs et al., 2010)	<p>"I feel competent to design (in EG1: write about) a loom band."</p> <p>"I think I have enough experience and knowledge to design (in EG1: write about) a loom band."</p> <p>"I think I will have difficulties with designing the loom band (in EG1: write about loom bands)" (reverse)</p>	.827
Perceived impact on corporate decisions (Fuchs et al., 2010)	<p>"I see that I have some control in determining which loom band will be produced by the [brand name]."</p> <p>"I have some influence in determining which products will be sold by the [brand name]."</p>	.816
Psychological ownership (Fuchs et al., 2010)	<p>"Although I do not legally own this loom band yet, I have the feeling that it is 'my' loom band."</p> <p>"The loom band incorporates a part of me."</p> <p>"I feel that this loom band belongs to me."</p> <p>"I feel connected to this loom band."</p> <p>"I feel a strong sense of closeness to this loom band."</p> <p>"It is difficult for me to think of this loom band as mine." (rev.)</p>	.919
Pride (Tracy and Robins, 2007)	<p>"Below are a number of words and phrases that describe different feelings and emotions. Read each item and then indicate the extent to which you feel this way using the scale shown below."</p> <ul style="list-style-type: none"> - accomplished - like I am achieving - confident - fulfilled - productive - like I have self-worth - successful 	.911
Do-it-yourself person (Norton et al., 2012)	Please rate the extent to which you consider yourself to be a "do-it-yourself" person.	Single item

Table C3: Experimental Design

			t ₀	t ₁	t ₂	Group Comparison I	Group Comparison II	Group Comparison III
Experimental Group 1 (EG1) n = 19	<i>Market Research</i>	(R)	O ₁		O ₂	Replication of the IKEA effect	IKEA effect in the context of customer empowerment	Examining the role of incompleteness and destruction
Experimental Group 2 (EG2) n = 19	<i>Build, no Empowerment</i>	(R)	O ₃	X ₁	O ₄			
Experimental Group 3 (EG3) n = 19	<i>Build, Empowerment</i>	(R)	O ₅	X ₂	O ₆			
Experimental Group 4 (EG4) n = 20	<i>Build, Empowerment, Incompletion</i>	(R)	O ₇	X ₃	O ₈			
Experimental Group 5 (EG5) n = 26	<i>Build, Empowerment, Destruction</i>	(R)	O ₉	X ₄	O ₁₀			

Notes:

R Random Assignment

O_t Measurement in t (t=1,...,10)

X₁ Treatment: Build a loom band

X₂ Treatment: Build a loom band in the context of customer empowerment

X₃ Treatment: Build a loom band in the context of customer empowerment and failing to complete

X₄ Treatment: Build a loom band in the context of customer empowerment and destruction of the loom band

t Time

Table C4: Results of Pre-Analyses

Construct	Method	Result
Gender	Pearson's χ^2 -test	$\chi^2 = 8.747$, $df = 4$, $p = .068$
Age	Welch test	$F = 1.389$, $df1 = 4$, $df2 = 47.331$, $p = .252$
Income	Pearson's χ^2 test	$F = 5.239$, $df1 = 4$, $p = .264$
Attitude toward the product category	Welch test	$F = 1.382$, $df1 = 4$, $df2 = 47.564$, $p = .255$
Brand liking	ANOVA	$F = .921$, $df1 = 4$, $df2 = 98$, $p = .455$
Perceived competence	ANOVA	$F = 1.369$, $df1 = 4$, $df2 = 3.232$, $p = .250$
Do-it-yourself-type	ANOVA	$F = .576$, $df1 = 4$, $df2 = 98$, $p = .681$

Table C5: Mean Differences in Willingness-to-pay

	EG1	EG2	EG3	EG4	EG5
Mean	.29	1.65	2.06	1.53	.66
SD	.38	1.11	1.95	1.43	.54

EG1
n = 19

EG2
n = 19

EG3
n = 19

EG4
n = 20

EG5
n = 26

Notes:

SD = Standard Deviation;

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

Table C6: Mean Differences in Psychological Ownership

	EG1	EG2	EG3	EG4	EG5
Mean	1.58	3.77	4.04	2.93	2.71
SD	.76	1.71	1.74	1.04	1.21
EG1 n = 19	-				
EG2 n = 19	2.19***	-			
EG3 n = 19	2.46***	.27	-		
EG4 n = 20	1.35***	-.84	-1.11		
EG5 n = 26	1.13***	-1.06	-1.33*	-.22	-

Notes:

SD = Standard Deviation;

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

Table C7: Covariance Matrix

		Psychological Ownership	Willingness-to-pay	Pride
Overall n=103	Psychological Ownership	2.423		
	Willingness-to-pay	.623	1.786	
	Pride	.514	.263	1.922
EG1 n=19	Psychological Ownership	.581		
	Willingness-to-pay	.107	.145	
	Pride	.135	.024	1.150
EG2 n=19	Psychological Ownership	2.914		
	Willingness-to-pay	1.109	1.232	
	Pride	1.028	-.001	2.544
EG3 n=19	Psychological Ownership	3.015		
	Willingness-to-pay	-1.098	3.785	
	Pride	-.421	.531	1.966
EG4 n=20	Psychological Ownership	1.086		
	Willingness-to-pay	.438	2.039	
	Pride	.097	.556	1.011
EG5 n=26	Psychological Ownership	1.468		
	Willingness-to-pay	.054	.290	
	Pride	1.041	.185	2.183

Figure C1: Toolkit



Figure C2: Mediation Analysis of Psychological Ownership (EG1 vs. EG2)

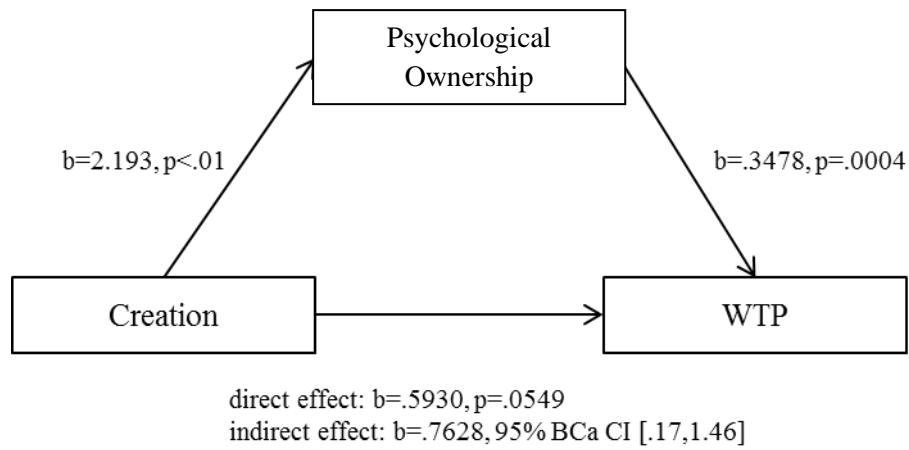
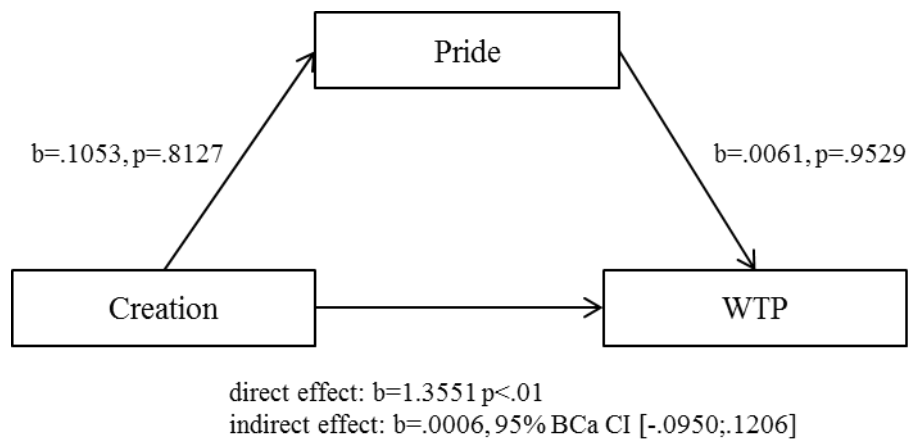


Figure C3: Mediation Analysis of Pride (EG1 vs. EG2)



Essay 4

Pictures Visualizing Touch – The Impact on Psychological Ownership

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Working Paper

Pictures Visualizing Touch – The Impact on Psychological Ownership

Abstract

The opportunity to touch a product has found to positively influence product evaluations, confidence in product choices, and psychological ownership. The latter describes a state in which consumers feel like possessing a product although not necessarily holding legal title to it. Although touch is important to those consumers who strive for tactile input during the purchase process - so called high need for touch (NFT) consumers - touch is not always feasible, e.g., in e-commerce settings. Used as a touch surrogate, this study shows pictures that explicitly visualize touch through a hand holding and feeling a product. Two kinds of products were shown to account for their differing levels of haptic importance for diagnostics. Results suggest that high NFT consumers (compared to low NFT) can more easily feel like owning products of high haptic importance and like them more. However, there needs to be congruence in apparent ethnicity between consumers and pictured models. For product with low haptic importance, we find no significant differences between high and low NFT consumers.

Keywords:

Psychological ownership, need for touch, touch surrogates, visualizing touch

Introduction

“A bear holding a pen, a hand holding cards, a man holding a can of soda, [...]” Sato, Schafer, and Bergen (2015) used pictures of these situations in their study on metaphor priming. All pictures activated the mindset of possession resulting in significantly more possession-related responses within metaphorical sentence production tasks. Although not explicitly stated, all stimuli that Sato et al. (2015) used to induce the possession mindset share the representation of touch. This finding nicely indicates the connection between touch and feelings of ownership.

In marketing research, touch represents a form of experiencing a product, its texture, hardness, temperature, and weight (Klatzky, Lederman, & Reed, 1987). Touch has been recognized as an impact factor of customers’ product quality perception (Grohmann, Spangenberg, & Sprott, 2007), confidence in the purchase decision (Peck & Childers, 2003a), and impulsive buying process (Peck & Childers, 2006). In addition to product diagnostics, touch indirectly influences product judgments (Klatzky & Peck, 2012), e.g., Krishna and Morrin (2008) observed different evaluations of the same product with different textures of packing materials. Products themselves can be classified according to the extent to which haptics are important for product judgments (Brasel & Gips, 2014; Citrin, Stem, Spangenberg, & Clark, 2003; Grohmann et al., 2007; McCabe & Nowlis, 2003). For example, clothes and blankets are considered high haptic important whereas for books and packaged goods visual inspection might be sufficient for product assessment (McCabe & Nowlis, 2003).

Apart from haptic product characteristics, consumers differ in their importance for haptic input, that is the extent to which consumers prefer touch information both for the actual product evaluation and for hedonic shopping experiences (Peck and Childers, 2003b). These differences divide them into high and low need for touch (NFT) consumers.

As a result, for some individuals the touch ability of specific products is more decisive than for others affecting consumers’ attitude toward the product (Grohmann et al., 2007;

Klatzky & Peck, 2012). Psychological ownership serves as an explanation: given the opportunity to physically examine a product, psychological ownership emerges (Brasel & Gips, 2014; Lessard-Bonaventure & Chebat, 2015; Peck, Barger, & Webb, 2013; Peck & Shu, 2009). It describes a sense of possession towards an object independent from any legal justification (Pierce, Kostova, & Dirks, 2003). Feelings of ownership in turn positively influence product evaluation, consumer satisfaction, and willingness to pay (WTP) (Peck et al., 2013; Peck & Shu, 2009).

These results have severe implications for situations where touch is not feasible (Citrin et al., 2003; McCabe & Nowlis, 2003; Peck & Childers, 2003a), especially applicable to online retailers. Previous research has already identified the important interaction between touch and vision (Balaji, Raghavan, & Jha, 2011; Chylinski, Northey, & Ngo, 2015; Krishna, 2006). To account for the missing haptic input, imagery has found to be effective. Peck et al. (2013) proposed mental imagery of touch, i.e., a mental resurgence of past multi-sensory experiences, to compensate the missing haptic information. They showed that briefing consumers to imagine touch especially with eyes closed comes close to actual touch when inducing psychological ownership. However, these instructions were very complex and needed high levels of consumer engagement, processing effort, and motivation to follow them - a situation very unlikely in everyday marketing practice (Kamleitner & Feuchtl, 2015). Consequently, researchers need other touch surrogates for high NFT consumers that include less cognitive effort. Hence, research on other touch surrogates draws on detailed descriptions, zoom, or 3D rotation to encourage imagery all appealing to the visual sense and memory of past haptic experiences with similar textures (Klatzky, Lederman, & Matula, 1993; Klatzky & Peck, 2012). Based on the idea that receiving real information via vision (e.g., seeing a product pictures) can substitute the absent tactile input, Choi and Taylor (2014) find consumers having the illusion to touch products in virtual settings increase mental imageries of touch leading to improved brand attitude and product liking. This relation is

moderated by consumers' NFT. However, they did not reference to psychological ownership. In a related study, Liu, Batra, and Wang (2017) propose a different consumer characteristic to affect purchase intentions. Consumers who focus on concrete aspects of products perceive higher psychological ownership resulting in higher purchase intention. Although the authors explicitly claim NFT has an insufficient explanatory power, they do not offer a competing comparison between the two. Ample research shows that NFT is moderating purchase intentions in touch/ no touch situations (Peck & Childers, 2006; Peck & Johnson, 2011; Spears & Yazdanparast, 2014), casting doubt on such statements. Other studies concerning the imagination of touch and psychological ownership did not focus on NFT (Brasel & Gips, 2014; Peck et al., 2013; Peck & Shu, 2009).

Addressing the issues above, this article sheds further light on the interplay between visualizing touch and psychological ownership identifying consumers' reaction when seeing pictures that invite touch. This study positions bridges technologically sophisticated surrogates and the hardly practicable mental imagination suggested by Peck et al. (2013). As a haptic cue, we use simple pictures that show a hand touching products inviting consumers to imagine the product use.

Across three experimental studies, we first address the missing empirical examination on how different NFT consumers respond to displaying touch in advertisements. We employ pictures compared to the above mentioned mental imagery instructions to ease application to marketing communication strategies (Klatzky & Peck, 2012). Second, we distinguish between products that previous research has classified as haptic important as well as unimportant. For the former, we show that first, pictures subtly depicting touch are already sufficient to enhance psychological ownership for high NFT individuals compared to low NFT individuals. Additionally, we check for mental imagery as a control variable in order to support the connection between the picture and the effect on psychological ownership. These feelings of ownership translate into an increase in product liking and purchase intention. For

the haptic unimportant products, we do not find this link. Third, we recognize a boundary condition for these relations. In case the pictured hand is incongruent in terms of ethnicity, we find no difference between low and high NFT individuals in evaluating the high haptic product. For the product with low haptic importance, mental imagery and psychological ownership levels still increase. However, they have no impact on subsequent product evaluations. Consequently, using our findings on different product dimensions (high vs. low haptic importance) as well as different consumer behavior styles (high vs. low NFT), retailers are able to create a targeted advertisement that does not need technological advances in order to increase product evaluation.

Theoretical Background and Hypotheses

Touch Availability and Need for Touch

Previous research already identified the importance of touch in consumer behavior (Krishna & Morrin, 2008; Orth, Bouzdine-Chameeva, & Brand, 2013; Peck & Childers, 2003b; Peck & Wiggins, 2006; Streicher & Estes, 2016). Touching a product during the purchase decision process leads to more confidence in product judgement (Choi & Taylor, 2014; Peck & Johnson, 2011) and product choice (Nuszbaum, Voss, Klauer, & Betsch, 2010; Streicher & Estes, 2016). Yet, individuals differ in their need for haptic input (Peck & Childers, 2003a). Thus, some consumers are more frustrated and evaluate a product as well as its quality worse when haptic input is absent (Grohmann et al., 2007; Peck & Shu, 2009).

In addition to consumers differing in their NFT, products themselves differ in their haptic character: Products possess either high or low haptic importance (Brasel & Gips, 2014; Klatzky & Peck, 2012; McCabe & Nowlis, 2003). McCabe and Nowlis (2003, p. 431) explained there are “products with primarily material properties, such as clothing and carpeting” that consumers need to haptically inspect more intensively. In contrast, haptic unimportant products fulfill a specific task and are functional. Moreover, some products seem to invite touch based on their material or shape so that high NFT consumers do not only enjoy the touching activity more but also assess touch as more essential (Klatzky & Peck, 2012).

Touch Surrogates and the Emergence of Product Liking and Purchase Intention

In many settings such as in online shopping, consumers do not have the option of touching products. As a consequence, retailers have begun to offer surrogates to account for the missing haptic input (Citrin et al., 2003; McCabe & Nowlis, 2003; Peck & Childers, 2003a). Prior research already investigated touch surrogates like imagination of touch through eyes closed (Peck et al., 2013) or a combination of visual input and subsequent haptic sensations such as 3D rotation, augmented reality, and sensory feedback through a force feedback device

(Choi & Taylor, 2014; Huang & Liao, 2017; Jin, 2011; Peck & Childers, 2003b). These touch surrogates rely on virtual product interaction to induce imagery of touch. Choi and Taylor (2014), for example, showed that presenting products in 3D advertising outperforms 2D advertising in effectiveness. Huang and Liao (2017) used, beside haptic imagery, augmented-reality interactive technology in order to overcome the distance between e-shops and consumers. In addition, imitating gestures deliver haptic sensations filling in for absent haptics, e.g. stroking an apparel via dragging the computer mouse or touchpads imitating direct product touch (Brasel & Gips, 2014; Overmars & Peols, 2015).

Following the “visual preview model” (Klatzky et al., 1993; Klatzky & Peck, 2012), these surrogates try to visually convey as much information on the products’ haptic characteristics aiming at making actual touch unnecessary. In other words, consumers do not necessarily need to touch products themselves. Their imagination of touch can already be enough to produce similar results. However, it does not need these technological advances. McCabe and Nowlis (2003) provide evidence for the power of less sophisticated touch surrogates. They show that pictures with tactile descriptions, i.e., how the product feels on the skin, surpasses descriptions of product attributes and produces similar results to actual touch. In addition, metaphorically conveying touch-related information, e.g., a feathery symbolizing smooth, silky touch, has long been recognized in advertising research (Spence & Gallace, 2011). Relatedly, Cian, Krishna, and Elder (2014) find pictures can elicit the imagination of dynamic movement affecting consumer engagement and improving product attitudes.

In times of media overload (Choi & Taylor, 2014; Huang & Liao, 2017; Overmars & Peols, 2015) contrary to technology-based touch surrogates this paper uses the power of visualizing touch as a non-technological surrogate.

Although on the one hand, high NFT consumers need touch surrogates more when the haptic input is not available compared to consumers low in NFT, they are, on the other hand, also more receptive by compensation methods (Jin, 2011; Peck et al., 2013; Peck & Childers,

2003a; Spears & Yazdanparast, 2014). Hence, combined with the distinction of low and high haptic important product, we hypothesize that visualizing touch only by a hand touching a high haptic important product makes high (in contrast to low) NFT think of touching it themselves. As a result, these consumers show an increased product liking and purchase intention.

Contrary, when seeing a product of low haptic importance getting touched, NFT does not have an impact on product liking and purchase intention as touch is not diagnostic for product evaluation (Klatzky & Peck, 2012).

H_{1a}: When touching a product of high (vs. low) haptic importance is unavailable, pictures visualizing touch lead to higher product liking among high NFT individuals compared to low NFT individuals.

H_{1b}: When touching a product of high (vs. low) haptic importance is unavailable, pictures visualizing touch lead to higher purchase intention among high NFT individuals compared to low NFT individuals.

(Imagination of) Touch Leads to Psychological Ownership

Initially developed in the workplace context to explain employee behavior (Avey, Avolio, Crossley, & Luthans, 2009; van Dyne & Pierce, 2004), psychological ownership has been stretched to many research fields such as teaching (Wood, 2016), nursing and children's development (Kaur, Sambasivan, & Kumar, 2013; Pesowski & Friedman, 2016; Verkuyten, Sierksma, & Thijs, 2015), or marketing (Fuchs, Prandelli, & Schreier, 2010; Hair, Barth, Neubert, & Sarstedt, 2016; Peck & Shu, 2009). It describes the feeling that an (intangible) object is one's own which is not necessarily accompanied with holding any legal entitlement (Pierce, Kostova, & Dirks, 2001). It comes into being when exercising control over an object, knowing it intimately, or investing resources like effort or time into the object (Pierce et al., 2003).

Previous marketing research has examined psychological ownership's emergence in various contexts. Fuchs et al. (2010) and Hair et al. (2016) examined psychological ownership in consumer empowerment strategies. When consumers can exert control in product portfolio decisions, these consumers feel higher ownership levels for their selected or created products leading, in turn, to better product evaluation and WTP. More abstract, Folse, Guidry Moulard, and Raggio (2015) induced psychological ownership by showing advertising messages that emphasize responsibility and being the creator of a certain outcome. While respondents actually did not actively influence the outcome, they still developed more feelings of ownership. Shu and Peck (2011) showed a variety of influencing factors on psychological ownership including, among others, emotions, length of ownership, or trading experience. Moreover, Kamleitner and Feuchtl (2015) linked the concepts of mental imagery and psychological ownership. Consumers were encouraged to imagine themselves as owners using the product, thereby increasing attachment and improving product attitudes.

Relatedly, touch as well as the imagination of touch yield higher psychological ownership (Brasel & Gips, 2014; Lessard-Bonaventure & Chebat, 2015; Peck et al., 2013;

Peck & Shu, 2009). Although not with the intention to directly examine the effect of touch, Reb and Connolly (2007) found that physical possession opposed to factual ownership lead to an increase in psychological ownership and thus WTP. Likewise, Peck and Shu (2009) explicitly tested the effect of touch and, in case of unavailability of touch, mental imagery on perceived ownership. Both yield higher psychological ownership and higher WTP. Interestingly, both positively and negatively valenced touch increases psychological ownership. Building on these findings, Peck et al. (2013) focused on mental imagery to touch a product instead of mental imagery to be the owner of a product. When consumers imagine touching an object with their eyes closed, their mental imagery and hence, the perception of physical control is more vivid which responds to higher psychological ownership.

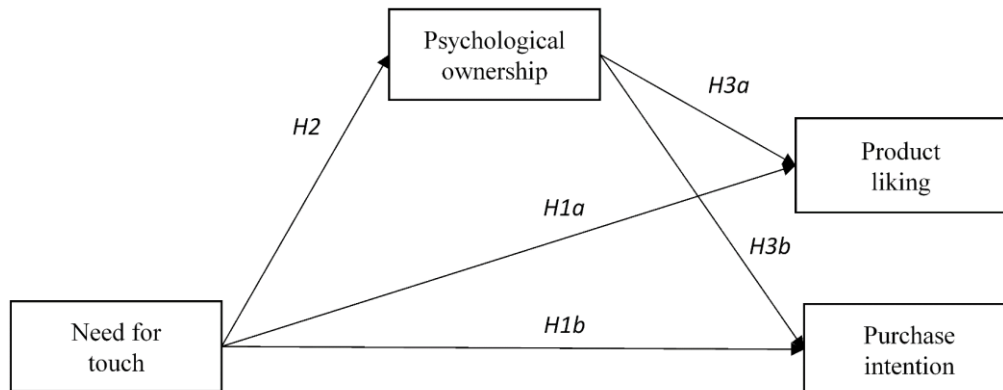
Considering the above, we hypothesize that the haptic cue of simply visualizing touch and thus control of high haptic important products translate into higher levels of psychological ownership (Brasel & Gips, 2014; Kamleitner & Feuchtl, 2015; Peck & Shu, 2009; Schlosser, 2003). We again do not believe that this holds for products with low haptic importance as tactile information on the product is not diagnostic (Brasel & Gips, 2014; Grohmann et al., 2007). In addition, we hypothesize that psychological ownership mediates the relation between the level of NFT and product liking as well as purchase intention (hypothesis 3). Figure 1 shows a graphical overview of our hypotheses.

H₂: When touching a product of high (vs. low) haptic importance is unavailable, pictures visualizing touch lead to higher psychological ownership among high NFT individuals compared to low NFT individuals.

H_{3a}: Psychological ownership mediates the effect of NFT on product liking.

H_{3b}: Psychological ownership mediates the effect of NFT on purchase intention.

Figure 1: Research Model



Study 1: Visualizing Touch

Design and Procedure. In Study 1, we test for the influence of individuals' NFT on psychological ownership, product liking, and purchase intention when touch is visualized. We use pictures showing a hand touching and feeling the promoted product. Thus, imagination of touch is triggered by displaying a hand touching the respective product. In addition, we verbally asked participants to imagine them using the product. We are especially interested in the interplay of the product's nature, i.e., product with high and low haptic salience, and feelings of ownership induced by imagination of touch. Following Brasel and Gips (2014) as well as Choi and Taylor (2014), we chose a blanket as the product of high haptic importance and a travel guide as the product with only little haptic importance.

A total of 95 students (64.2 percent female, 27.12 years old on average) of a German university filled out our online questionnaire. They were randomly assigned to the two product type versions of blanket (n = 50) and travel guide (n = 45). The questionnaire ostensibly dealt with a market analysis to derive the product's attractiveness. We explicitly told the participants that we excluded the brand name in order to rule out possible interferences of the brand on product evaluation.

Figure 2: Pictures Visualizing Touch of Products with High and Low Haptic Salience



The survey started with showing either a product of high haptic salience or low haptic salience touched and felt by a hand (see Figure 2). The participants saw the advertisement at the beginning of the questionnaire. First, we asked participants to look at the advertisement and let their imagination flow. In line with Peck and Shu (2009), we tried to stimulate mental imageries by additional guiding questions such as “What would you do with the product when taking it home?” before measuring mental imagery. Mental imagery is used as a control variable in order to check the participants’ attention to the presented advertisement. Subsequently, we inquired the respondents’ product liking, their purchase intention, and their psychological ownership for the product. The questionnaire concluded with the measurement of NFT and demographics like gender, age, and ethnicity to mitigate possible effects of ethnical cues.

Measures. The operationalization of the constructs draws on reflective measures commonly used in prior research. Since all measures denote manifestations of the underlying construct, this study uses reflective items (as opposed to formative ones; (Diamantopoulos, Riefler, & Roth, 2008). Table D1 in Appendix A provides an overview of all construct measures.

Results. In the course of analysis, we checked for internal consistency for all constructs. As all Cronbach’s α exceed the critical threshold of 0.7, we averaged all corresponding items to form a score for every construct. The scores’ means were analyzed by employing independent samples *t*-tests.

Regarding the product with high haptic importance, the analysis of differences in mental imagery between low and high NFT individuals supports our hypothesis. When seeing a hand touching the blanket, high NFT individuals report significantly higher scores in mental imagery than low NFT individuals. Hence, high NFT individuals can produce clearer images of the product and can more easily imagine using the product than low NFT individuals. We also find support for our next hypotheses. Individuals with higher scores in NFT like the product more and have a higher purchase intention. The same holds true for psychological ownership. Visualizing touch leads high NFT individuals feel ownership for the advertised product (see Table 1).

Table 1: Effect of Visualized Touch of a Product with High Haptic Importance

Change of Dependent Variable	NFT	M	SD	t-Value
H _{1a} : Product Liking	Low	3.72	1.08	-3.255**
	High	4.94	1.36	
H _{1b} : Purchase Intention	Low	2.56	1.28	-4.35**
	High	4.35	1.46	
H ₂ : Psychological Ownership	Low	1.78	1.08	-3.56**
	High	3.30	1.92	

* $p < .05$; ** $p < .01$

The mediation analysis' results (see Table 2) indicate that psychological ownership fully mediates both the relationship between NFT and product liking and the one between NFT and purchase intention.

Table 2: Mediation Analysis for a Product with High Haptic Importance

Change of Dependent Variable	Construct	coeff	se	t-value	p-value
H _{3a} :	NFT	0.1838	0.1310	1.4026	0.1674
Mediation Product Liking	PO	0.4532	0.0913	4.9642	0.0000
Indirect effect		effect	bootSE	bootLLCI	bootULCI
	PO	0.2662	0.1043	0.0885	0.4935
Change of Dependent Variable	Construct	coeff	se	t-value	p-value
H _{3b} :	NFT	0.2356	0.1234	1.9088	0.0625
Mediation Purchase Intention	PO	0.6498	0.0860	7.5561	0.0000
Indirect effect		effect	boot	bootLLCI	bootULCI
	PO	0.3817	0.1337	0.1393	0.6709

Opposed to the product with high haptic importance, here low and high NFT individuals do not differ in neither product liking, nor purchase intention, nor psychological ownership (see Table 3). Additionally, the control variable of mental imagery shows also no significant difference ($p = .366$). Thus, a mediation analysis is not applicable as the direct path between NFT and psychological ownership is insignificant.

Table 3: Effect of Visualized Touch of a Product with Low Haptic Importance

Change of Dependent Variable	NFT	M	SD	t-Value
H _{1a} : Product Liking	Low	4.29	1.29	-.62
	High	4.53	1.19	
H _{1b} : Purchase Intention	Low	3.37	1.44	-1.64
	High	4.12	1.64	
H ₂ : Psychological Ownership	Low	2.46	1.30	-.84
	High	2.88	1.84	

* $p < .05$; ** $p < .01$

Discussion and Motivation for Further Research. Klatzky and Peck (2012) identified products that invite touch or ‘touch ability’. Thus, high NFT individuals want to touch the blanket of the picture for hedonic purposes. The hand shown on the picture intensifies this feeling that leads to an increase in both product liking and purchase intention for high NFT individuals.

Further, high NFT consumers establish psychological ownership for the product with haptic importance (Peck et al., 2013, 2013; Peck & Shu, 2009) and this feeling of ‘being mine’ intensifies the desire to purchase the blanket as well as the valuation of the product. Contrary, the travel guide, analyzed as a product with low haptic importance, does not impact high NFT consumers (Shu & Peck, 2007). Due to the missing desire to touch or possess the travel guide, NFT does not influence psychological ownership, purchase intention, nor product liking. It is even possible that consumer do not want others to touch the travel guide and rather feel disturbed by the hand because the travel guide as a product with low haptic importance has to have a specific purpose, namely to offer information about New York City. Thus, consumers are afraid that others wear out the travel guide and therefore, do not want others to touch it (Argo, Dahl, & Morales, 2008).

The findings of study 1 yield us to set up boundary conditions for the effect. In a follow-up study, we consider the importance of visualizing touch. Otherwise, it is reasonable to suggest that only the mental imagination that we have tried to trigger via the instructions is enough for high NFT consumers to increase psychological ownership, product liking, and purchase intention. Furthermore, it is questioned if an advertisement with a travel guide is suitable without showing a hand.

Study 2: No Haptic Cues

Design, Procedure, and Measures. Study 2 follows the same design as study 1 but instead of visualizing touch by letting a hand hold the product, we simply show just the products without any hand in the same setting as in study 1 (see Figure 3). Moreover, the questionnaire contains the same constructs as study 1. A total of 102 (57.8 percent female, 28.5 years old on average) students of a German university answered our two questionnaire variants (n = 60 for blankets, n = 42 for travel guides).

Figure 3: Pictures Without Visualizing Touch



Results. Analyses show that we do not find any significant differences between low and high NFT individuals regarding their mental imagery, product liking, purchase intention, or psychological ownership when touch is not visualized. This holds true for both product types (see Table 4 and Table 5 respectively). Hence, we cannot run the mediation analysis.

Table 4: Effect of Plain Pictures of a Product with High Haptic Importance

Change of Dependent Variable	NFT	M	SD	t-Value
H _{1a} : Product Liking	Low	4.33	1.11	-1.43
	High	4.87	1.56	
H _{1b} : Purchase Intention	Low	3.25	1.34	-1.69
	High	4.02	1.92	
H ₂ : Psychological Ownership	Low	2.34	1.44	-1.68
	High	3.17	2.06	

* $p < .05$; ** $p < .01$

Table 5: Effect of Plain Pictures of a Product with Low Haptic Importance

Change of Dependent Variable	NFT	M	SD	t-Value
H _{1a} : Product Liking	Low	3.73	1.06	-1.48
	High	4.29	1.34	
H _{1b} : Purchase Intention	Low	3.01	1.68	-1.88
	High	4.00	1.52	
H ₂ : Psychological Ownership	Low	1.79	1.25	-1.68
	High	2.98	2.14	

* $p < .05$; ** $p < .01$

Discussion and Motivation for Further Research. Study 2 identifies the importance of the depicted hand for a product with high haptic importance. Without seeing a hand feeling the blanket, high NFT consumers neither generate psychological ownership nor possess a higher purchase intention and product liking. Contrary to Peck and Shu (2009) pure mental imagery is not sufficient to develop psychological ownership. It is possible that nowadays there are too

many technical possibilities in order to compensate the missing tactile input so that mental imagery in times of sensory overload is presumably not sufficient anymore (Ausburn & Ausburn, 2008).

The importance of the hand in the advertisement leads to the questions whether there are certain requirements for the pictured hands with respect to congruence with consumer characteristics. One intuitive condition would be skin color of the depicted hand. Previous studies on ethnicity (Sierra, Hyman, & Torres, 2009) show diverse effects of ethnic cues on attitudes towards print ads and products. Some researchers find that mostly only non-White consumers react more positively to same ethnicity cues compared to Whites (Appiah, 2001; Bush, Gwinner, & Solomon, 1974; Forehand, Deshpandé, & Reed, 2002). In contrast, others find the ethnic congruence to one's self concept to positively affect ad responses and purchase intentions both for Whites and non-Whites (Forehand & Deshpandé, 2001; Lee, Fernandez, & Martin, 2015; Sierra et al., 2009; Whittler, 1989).

This raises the question whether ethnic congruence of the pictured hand impacts the product evaluation of low versus high NFT consumers. We argue that high NFT consumers will less respond to the pictured touch in a sense that mental imagery of using and hence, touching the product becomes more difficult for them. This will probably result in diminishing differences between low and high NFT consumers. Therefore, we conducted a third study to examine this expected relation.

Study 3: Visualizing Touch with Incongruent Skin Color

Design, Procedure, and Measures. Study 3 again follows study 1 in its procedure and measured constructs. However, the skin color of hand holding the products is not congruent to the respondents (see Figure).

A total of 108 students (71.3 percent female, 27.72 years old on average) of a German university answered our two questionnaire variants (n = 61 for blankets, n = 47 for travel guides).

Figure 4: Pictures visualizing touch with incongruent skin color



Results. In contrast to study 1's results for the product with high haptic importance where we found significant differences between low and high NFT individuals in the variables of interest, study 3 does not render these findings. When the skin color in the picture is different from the respondents', the NFT level does not influence the evaluations of the product with high haptic importance (see Table 6).

Table 6: Effect of Visualized Touch with Incongruent Skin Color of a Product with High Haptic Importance

Change of Dependent Variable	NFT	M	SD	<i>t</i> -Value
H _{1a} : Product Liking	Low	4.29	.88	-1.81
	High	4.79	1.16	
H _{1b} : Purchase Intention	Low	3.17	1.54	-1.93
	High	3.96	1.59	
H ₂ : Psychological Ownership	Low	2.44	1.55	-1.89
	High	3.26	1.78	

* $p < .05$; ** $p < .01$

Interestingly, low and high NFT individuals differ significantly in their mental imagery of the product with low haptic importance when the advertisement depicts touch by a hand with incongruent skin color ($p = .036$). Similarly, psychological ownership is also significantly higher for the high NFT individuals in this case. However, we cannot find support for any differences in the product liking or purchase intention (see Table 7)

Table 7: Effect of Visualized Touch with Incongruent Skin Color of a Product with Low Haptic Importance

Change of Dependent Variable	NFT	M	SD	t-Value
H _{1a} : Product Liking	Low	4.55	.96	-1.01
	High	4.89	1.3	
H _{1b} : Purchase Intention	Low	3.42	1.54	-1.36
	High	4.15	2.03	
H ₂ : Psychological Ownership	Low	2.23	1.40	-2.64*
	High	3.44	1.75	

* $p < .05$; ** $p < .01$

Discussion. Results show that a hand with a different apparent ethnicity on the product with high haptic importance does not lead to psychological ownership or higher product liking, respectively higher purchase intention for high NFT consumers. If the skin color of the hand touching the blanket differs from the own skin color, the touch surrogate failed. Surprisingly, high NFT consumers generate mental imagery and psychological ownership when seeing this hand holding the travel guide of New York. High NFT consumers are able to imagine using the travel guide more when the hand incongruent to one's own ethnicity is visualized. It is possible that this hand supports the idea of the New York travel guide better and thus, high NFT consumer are able to develop psychological ownership. Travel guides are used in order to learn more about other countries and new cultures (Ramm, 2000). Kemple, Lee, and Harris (2016) identified the curiosity of young individuals about different skin colors because human diversity can be obviously noticed. Thus, it might be possible that the emerged curiosity caused by the visualization of different skin colors emphasizes the purpose of the travel guide that leads to a connection between high NFT consumers and the product. Nevertheless, very

surprisingly, results do not point out effects between high NFT consumers and purchase intention or product liking. Moreover, psychological ownership does not mediate the effect. High NFT consumers are more attracted to a hand with incongruence in skin color holding the travel guide and can better imagine to use it, but the touch surrogate does not affect the economic variables.

General Discussion

While most studies on touch identify the link between touch unavailability in combination with high NFT, so far no other studies have explicitly focused its investigation on how consumers differing in their NFT react to different stimuli of visualizing touch. In three studies, we found that subtly depicting touch with a hand holding a product influences high and low NFT consumers differently. Moreover, the haptic importance of a product plays a key role. When high NFT individuals (compared to low NFT) see the touch of a product with high haptic importance (i.e., a blanket), they develop psychological ownership. These feelings of ownership increase product liking and purchase intention. There is no significant difference between low and high NFT individuals for the product with low haptic importance (i.e., the travel guide). Without visualizing touch by the hand or in case of ethnic incongruence, these differences nearly vanish. Surprisingly, the only exception is psychological ownership for the travel guide when a hand with a different apparent ethnicity touches it. We suggest, the effect occurs because of individuals' curiosity for human diversity caused by the travel guide that insinuates different cultures and areas.

Particularly in the last two decades, the sensory overload caused by growing technology and social media is immense. While in 2011 every fifth person in Europe used social media on a daily basis, this number has more than doubled in 2017 (Statista, 2018a). Based on the increasing different advertisement channels, consumers faces promotion

everywhere (Leeflang, Verhoef, Dahlström, & Freundt, 2014). Especially the online and mobile advertisement gains in importance (McMahan, Hovland, & McMillan, 2009), but the printed version is still increasing as well (Statista, 2018b). With our studies, we help marketing managers in their competition for customers' attention and help to create advertisements that especially attract and support consumers that need tactile input in their purchase decision and shopping experience in situations where the tactile input is impossible to convey.

Further research can build on our limitations. In order to expand transferability of our results, it is worth replicating our study with a different product of low haptic importance that ensures more neutrality. As part of study 3 (seeing a hand of incongruent skin color touching the travel guide), the ethnic incongruence could have exactly represented the core of travel guides, experiencing other countries and cultures (Ramm, 2000). A more neutral product like pocket calculators, office supplies, or picture frames could emphasize the importance visualizing touch for high NFT consumers. In a similar vein, it might be worth re-running our study with a different target group such as Black people or Hispanics as research on the influence of ethnicity on product attitudes seems to agree that in general, non-Whites tend to respond more to ethnic cues than Whites (Sierra et al., 2009). If that holds for our study, our results would become even more pronounced.

In addition, we have only focused on the examination of apparent ethnicity's influence on the link of NFT, touch, and psychological ownership. Including other variables would help to shed further light on this research area. Further research could use obvious gender attributes (manicured female hand versus male hand) as new stimuli to account for importance of gender in advertising strategies (Wollin, 2003). Marketers largely draw on customers' gender as it is an easy to implement segmentation basis (Wollin, 2003). Moreover, Krishna, Elder, and Caldara (2010) used masculinity and femininity in their multisensory study. They found that semantic congruence in the smell and touch perception with gender-related associations

increases product evaluation. As NFT dimensions differ between males and females (Workman, 2009), it would be beneficial to investigate how male and female high NFT consumers react to the often used advertising variable and if congruence to one's own gender is necessary. Apart from gender, age cues can be relevant for our study. Amatulli, Peluso, Guido, Yoon, and Morales (2018) offer insights how age cues shape our self-concept, feel-age and product choices. High NFT individuals might need congruence between their own age and the perceived age of the pictured hand. Lastly, dexterity cues directly relate to touch. Around 90 percent of us are right-handed and hence, most products are designed accordingly (Eelen, Dewitte, & Warlop, 2013). As a result, showing a left hand touching the products in our study could affect high NFT consumers for whom the pictured hand is relevant in their product evaluations.

Other than changing the setting of our study, future research could also concentrate on how the paths to psychological ownership connect with NFT and visualized touch. Whereas Peck et al. (2013) showed that imagery with eyes closed triggers perceived control, the impact of the other two mechanisms of coming to know the product and investing time remain unclear although it would be interesting to see which motives of psychological ownership are satisfied for high NFT consumers in our study.

We believe that our studies offer a promising starting point that contributes to the sensory marketing research as well as to insights consumer attraction in practice.

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Appendix D

Table D1: Overview of the Constructs' Measurement

Construct	Items	Items' Wording	Source	Cronbach's α		
				Study 1	Study 2	Study 3
Mental Imagery	7	<p>I imagined what it would be like to use the product advertised.</p> <p>I imagined the feel of the product.</p> <p>Many images came to my mind.</p> <p>My imagery that occurred was...</p> <p>Clear</p> <p>Detailed</p> <p>Fuzzy</p> <p>Vivid</p>	Adapted from Babin and Burns (1998); Kamleitner and Feuchtl (2015)	.751	.671	.761
Product Liking	5	<p>This is a bad/ good product.</p> <p>I dislike/ like the product.</p> <p>I feel negative/ positive towards the product.</p> <p>The product is unattractive/ attractive.</p> <p>I disapprove/ approve of the product.</p>	Adapted from Leclerc, Schmitt, and Dube (1994); Shamdasani, Stanaland, and Tan (2001)	.904	.860	.860
Purchase Intention	4	<p>I would like to try the product.</p> <p>I would buy this product.</p> <p>I would actively seek out this product.</p> <p>I would patronize this product.</p>	Taken from Okechuku, C., & Wang, G. (1988)	.910	.937	.924
Psychological Ownership	3	<p>I feel the product belongs to me.</p> <p>Although I do not legally own this product yet, I have the feeling that it is "my" product.</p> <p>I feel like I own this product.</p>	Adapted from Van Dyne and Pierce (2004); Peck and Shu (2009)	.953	.980	.944

Need for Touch (NFT)	14	<p>When walking through stores, I can't help touching all kinds of products.</p> <p>Touching products can be fun.</p> <p>I place more trust in products that can be touched before purchase.</p> <p>I feel more comfortable purchasing a product after physically examining it.</p> <p>When browsing in stores, it is important for me to handle all kinds of products.</p> <p>It is very difficult for me to refrain from touching products in stores.</p> <p>If I can't touch a product in the store, I am reluctant to purchase it.</p> <p>I like to touch products even if I have no intention of buying them.</p> <p>I feel more confident purchasing a product I have touched first because I can determine its quality.</p> <p>When browsing in stores, I like to touch lots of products.</p> <p>The only way to make sure a product is worth buying is to actually touch it.</p> <p>There are many products that I would only buy if I could handle them before purchase.</p> <p>I find myself touching all kinds of products in stores.</p> <p>I rarely buy items that I haven't touched first.</p>	Nuszbaum et al. (2010); Peck and Childers (2003a)	.954	.931	.935
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