UNIVERSITÄT BAYREUTH

„Empirische Beiträge zum Konsumentenverhalten in digitalen Medien: Diffusion und Akzeptanz innovativer Technologien“

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Für meine Eltern und meinen Bruder, sowie meine Freunde, denen mein besonderer Dank für ihre Unterstützung gilt!

Abstract

Der digitale Wandel führt in nahezu allen Lebensbereichen zu einer Veränderung des täglichen Miteinanders und trug in den letzten Jahren maßgeblich zu einer wachsenden Anzahl an technologischen Innovationen bei. Nicht jede dieser Innovationen hat sich am Markt etablieren können, weshalb der Diffusion und Adoption von Innovationen in der Konsumentenverhaltensforschung ein großer Stellenwert beigemessen wird. Eine übergeordnete Bedeutung kommt hierbei dem Prozess der Innovationsentscheidung und der während des Prozesses verwendeten Kommunikationskanäle zu. Da die fünf angefertigten Forschungsbeiträge dieser kumulativen Dissertation wichtige Elemente des Prozesses der Innovationsentscheidung behandeln, bildet er die theoretische Grundlage dieser Dissertationsschrift.

Forschungsbeitrag 1 dient der Untersuchung von Charakteristika wichtiger Entscheidungseinheiten für den Diffusionsprozess von Innovationen und analysiert ihr Kommunikationsverhalten. Zielsetzung ist es demnach, zuerst eine geeignete Grundlage zur Klassifizierung bzw. Identifizierung von potenziellen technologischen Early Adopter (EA) zu schaffen, bevor ihr Internetnutzungsverhalten mit dem der Mehrheit der deutschen Bevölkerung verglichen werden soll. Eine Analyse eines umfangreichen Datensatzes unter Verwendung eines Welch-Tests zeigt, dass EA das Internet signifikant häufiger, insbesondere für Informations- und Kommunikationszwecke sowie für spezifische Dienstleistungen wie Online-Shopping oder Online-Banking, nutzen, als die übrige Bevölkerung.

Mit spezifischem Fokus auf dem Internet als Informations- und Kommunikationskanal ist das Ziel des 2. Forschungsbeitrags zu untersuchen, ob verschiedene Arten negativer elektronischer Mundpropaganda (eWOM) unterschiedlich starke negative Auswirkungen auf die Einstellung der Verbraucher zu einem Produkt haben. Zusätzlich soll überprüft werden, inwieweit die dadurch provozierte Einstellung angesichts späteren Einflusses positiven eWOMs unbeeinflusst bleibt. Mit Hilfe einer experimentellen Untersuchung kann gezeigt werden, dass funktionales eWOM einen besonders großen Rückgang der Konsumenteneinstellung provoziert, während ethische Kritik am schwierigsten wieder zu korrigieren ist.

Nachdem die individuellen Charakteristika wichtiger Entscheidungseinheiten für den Diffusionsprozess von Innovationen konkretisiert und ihr Kommunikationsverhalten

analysiert worden ist, wird dem Internet als Kommunikationskanal, durch eine Untersuchung der Auswirkungen negativer Online-Kommunikation, weitere Beachtung geschenkt. Für den folgenden Verlauf des Prozesses der Innovationentscheidung sind Aussagen über Innovationscharakteristika sowie das individuelle Entscheidungsverhalten zu treffen. Zur Ergründung hemmender Diffusion neuer Technologien wird sich deshalb der Akzeptanzforschung gewidmet.

Hierzu sind das mobile Bezahlen (MP) und das Social Trading (ST) als Analyseobjekte ausgewählt und untersucht worden. Die durchgeführten Forschungsstudien 3 bis 5 befassen sich mit möglichen Erklärungen für die unzureichende Verbreitung dieser Finanzdienstleistungsinnovationen, um Implikationen für eine Verbesserung der Angebote geben zu können. So ist es die Zielsetzung des 3. Dissertationsbeitrages, die moderierende Wirkung generationsspezifischer Unterschiede hinsichtlich technologischer Faktoren auf die Nutzungseinstellung gegenüber MP zu analysieren. Im 4. Beitrag wird thematisch anknüpfend der Forschungsfrage nachgegangen, inwieweit kulturelle Unterschiede zwischen Deutschland und den USA einen Einfluss auf die Beziehungen zwischen technologischen, sozialen und vertrauensbildenden Aspekten auf die Verhaltensabsicht gegenüber der Nutzung von MP haben. In der abschließenden Forschungsstudie 5 ergibt sich die Zielsetzung aus einer bisher unzureichenden wissenschaftlichen Auseinandersetzung mit dem Themenkomplex ST. Es wird die Forschungsfrage ergründet, welche Faktoren die Nutzungsintention potentieller Kunden zum ST bedingen und welche moderierende Rolle den bisherigen Erfahrungen von Konsumenten im Wertpapierhandel in diesem Beziehungskonstrukt zukommt.

Die Ergebnisse einer moderierten Regressionsanalyse legen nahe, dass die jüngere Generation der Digital Natives (DN) MP für nützlicher, bedienungsfreundlicher und sicherer hält als die ältere Gruppe der Digital Immigrants (DI). Zudem haben DN eine positivere Einstellung gegenüber MP. Darüber hinaus hat der negative Einfluss der wahrgenommenen Sicherheit einen signifikant stärkeren Einfluss auf die Einstellung von DI als auf DN. Hinsichtlich des angestellten Kulturvergleiches lässt eine Moderatoranalyse auf Grundlage eines Strukturgleichungsmodells einen moderierenden Einfluss der Kulturfaktoren auf die Beziehung zwischen dem sozialen Einfluss und der Verhaltensabsicht zur Nutzung von MP erkennen. Für beide Länder können die übergeordnete Bedeutung des allgemeinen Vertrauens in MP, die zu erwartende Nützlich-

keit sowie der soziale Einfluss nachgewiesen werden. Die Resultate zum Forschungsfeld des ST basieren auf einem Mehrgruppenvergleich innerhalb eines Strukturgleichungsmodells. Es zeigt sich, dass bei im Umgang mit Wertpapieren erfahrenen potenziellen Nutzern die leistungsbezogenen Aspekte die dominierenden Ursachen für eine zurückhaltende Nutzungsabsicht gegenüber ST sind. Für die Gruppe der unerfahrenen potentiellen Nutzer hingegen sind systembezogene und persönliche Barrieren die beeinflussenden Faktoren.

Die Ergebnisse dieser Dissertationsbeiträge tragen somit maßgeblich zum Forschungsdiskurs über innovative Finanzdienstleistungsinnovationen bei und unterstreichen die Bedeutung einer zielgruppenspezifischen Kommunikation eines nutzenstiftenden und vertrauenswürdigen (mobilen) Zahlungsverkehrs. Es lässt sich feststellen, dass sowohl beim MP als auch beim ST die bisherigen Promotionsbemühungen nicht zielgerichtet genug waren und deshalb Anpassungen der Kommunikationspolitik mit Hilfe der erzielten Resultate vorzunehmen sind.

Inhaltsverzeichnis

Überblick über die Beiträge der Dissertationsschrift

Die Dissertation beinhaltet die folgenden Beiträge:

Forschungsbeitrag 1:

Reith, R., Fischer, M., Lis, B. 2020. How to Reach Technological Early Adopters? An Empirical Analysis of Early Adopters' Internet Usage Behavior in Germany. *International Journal of Innovation and Technology Management,* 17. DOI: https://doi.org/10.1142/S0219877020500108.
(VHB JOURQUAL 3: Category C)

Forschungsbeitrag 2:

Lis, B. and Fischer, M. 2020. Analyzing different types of negative online consumer reviews. *Journal of Product & Brand Management,* DOI: https://doi.org/10.1108/JPBM-05-2018-1876.
(VHB JOURQUAL 3: Category C)

Forschungsbeitrag 3:

Fischer, M., Wömmel, A., Reith, R., & Lis, B. 2017. A Generation Comparison of Mobile Payment Acceptance Factors: An Empirical Investigation. In *Proceedings of the 25th European Conference on Information Systems* (ECIS): 2395–2412. Guimarães, Portugal.
(VHB JOURQUAL 3: Category B)

Forschungsbeitrag 4:

Fischer, M., Reith, R. & Lis, B., 2020. Paying Mobile at the point of Sale – A Question of Culture. *Working Paper*, DOI: https://doi.org/10.15495/EPub_UBT_00004719.

Forschungsbeitrag 5:

Reith, R., Fischer, M., & Lis, B. 2020. Explaining the Acceptance of Social Trading Platforms: An Empirical Investigation. *Journal of Business Economics*, 90: 427–460. DOI: https://doi.org/10.1007/s11573-019-00961-2.
(VHB JOURQUAL 3: Category B)

1 Synopsis

1.1 Einleitung

Immer kürzere Innovationszyklen zwingen die Unternehmen, viel Geld in Forschung und Entwicklung zu investieren, um auf den globalen und dynamischen Märkten langfristig wettbewerbsfähig bleiben zu können. Die Gefahr von Fehlinvestitionen steigt mit der Geschwindigkeit und dem Druck, den Konsumenten ständig Produktneuheiten präsentieren zu müssen. Da sich nicht jede dieser Innovationen am Markt etablieren kann, ist ein fundamentales Wissen über den Diffusionsprozess und die Adoption technologischer Innovationen unabdingbar, um mögliche Fehlallokationen zu minimieren. Entscheidend ist zusätzlich, Aussagen über die akzeptanzstiftenden Eigenschaften eines innovativen Angebots treffen zu können. Die wachsende Relevanz digitaler Medien führt diesbezüglich zu völlig neuen Möglichkeiten der Informationsgewinnung und bietet sich zudem als relevantes Untersuchungsobjekt an.

Aufgrund der intensiven Nutzung des Internets als Informations- und Kommunikationsmedium (statista, 2020) sehen sich die Unternehmen und die Gesellschaft veränderten Spielregeln der Marktteilnahme gegenüber. Verbraucher suchen gezielt nach Produktinformationen anderer Nutzer und haben die Möglichkeit eigene konsumbezogene Ratschläge zu erteilen. Daher erlangt die elektronische Mundpropaganda “electronic word of mouth“ (eWOM) einen immer größeren Stellenwert unter den Konsumenten. Daraus resultierend werden heutzutage vermehrt Kaufentscheidungen auf Grundlage online basierter Informationen getroffen (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Kim, Maslowska, & Malthouse, 2017). Dies gilt insbesondere für technologische Innovationen, da Informationen über solche Neuheiten in den Anfängen der Marktdiffusion knapp sind. Da darüber hinaus das eWOM ein entscheidender Faktor für das Social-Media Marketing vieler Unternehmen geworden ist (Chang, Yu, & Lu, 2015; Hussain et al., 2007; Schweidel & Moe, 2014), müssen auch diese sich den veränderten Rahmenbedingungen anpassen. Durch ein systematisches Monitoring online basierter Kommunikation auf relevanten Plattformen können sie eine gezielte Informationsweitergabe steuern und negativen eWOM-Prozessen frühzeitig entgegenwirken (Bronner & de Hoog, 2010).

Neben den erweiterten Möglichkeiten der Informationsgewinnung hat zusätzlich die

Anzahl der technologischen Innovationen mit Hilfe der Digitalisierung merklich zugenommen. Nicht nur deswegen ist die Diffusion neuer Technologien ein wichtiger Forschungszweig im Rahmen der Konsumentenverhaltensforschung geworden (u. a., Goldsmith & Witt, 2003; Hirschman, 1980; Lynn, Muzellec, Coemmerer, & Turley, 2017; Midgley & Dowling, 1978; Reinhardt & Gurtner, 2015; Rogers, 2003). Wesentliche noch zu eruierende Fragestellungen in diesem Bereich betreffen die entscheidenden Einflussnehmer auf den Diffusionsprozess, deren verwendete Kommunikationskanäle sowie mögliche Gründe für eine verzögerte Verbreitung von Innovationen.

Durch eine Fokussierung auf die Identifizierung und Verhaltensanalyse wichtiger Kundengruppen im Prozess der Innovationsentscheidung sowie Akzeptanzanalysen gegenüber technologischen Innovationen setzt die vorliegende kumulative Dissertationsschrift an diesen Punkten an. Bevor jedoch konkreter auf den Analysehorizont dieser Dissertation eingegangen werden kann, müssen zuvor grundlegende Begrifflichkeiten und Zusammenhänge operationalisiert werden. So wird das heutige Verständnis von Innovation in besonderem Maße von Joseph Schumpeter geprägt, der in der Innovation eine „schöpferische Zerstörung“ sieht, da Bestehendes durch neue Ansätze ersetzt wird (Schumpeter, 1931). Während viele Autoren den Begriff der Innovation primär mit dem Attribut der Neuartigkeit verbinden (Barnett, 1953; Knight, 1967; Schmookler, 1966), stellt Rogers (2003) zusätzlich die Frage der Verbreitung von Innovationen in den Vordergrund. In seiner Theorie der Innovationsdiffusion beschreibt er die Diffusion von Innovationen als den Prozess, bei dem eine Innovation über die Zeit unter den Mitgliedern eines sozialen Systems über diverse Kanäle kommuniziert wird (Rogers, 2003). Zusätzlich klassifiziert er nicht nur verschiedene Adoptionsgruppen nach dem Zeitpunkt ihrer erstmaligen Nutzung neuer Ideen, sondern beschreibt auch den Prozess der Innovationsentscheidung. Dieser reicht von der ersten Kenntnisnahme einer Innovation bis zur letztlichen Bestätigung einer Adoptionsentscheidung (Rogers, 2003). Somit hängt der wirtschaftliche Erfolg einer Innovation in besonderem Maße von seiner Adoption ab, die von Rogers (2003, 21) als “[..] a decision to make full use of an innovation as the best course of action available” definiert wird. Mittels der Adoption einer Innovation durch einzelne Individuen findet die beschriebene Diffusion statt. Im Gegensatz zur Adoption ist die Akzeptanz eine bestimmte Haltung gegenüber einer neuen Technologie. Hat ein Konsument demnach eine innovative Dienstleitung in Anspruch genommen oder ein innovatives Produkt gekauft, diese(s)

aber nicht akzeptiert, ist eine vollständige Adoption unwahrscheinlich (Biljon & Renaud, 2008). Deshalb ist nach Chiesa und Frattini (2011) die Akzeptanz einer Innovation für eine erfolgreiche Markteinführung neuer Angebote maßgeblich. So verwundert es nicht, dass viele Forscher die Bedeutung der Akzeptanz von Technologien für die Diffusion von Innovationen hervorheben (Davis et al. 1989; Moore & Benbasat, 1991, 1996; Venkatesh et al., 2003).

Zur flächendeckenden Akzeptanzschaffung und damit auch bei der Verbreitung von Innovationen, kommt den ersten Nutzern einer Technologie eine besondere Bedeutung zu (Rogers, 2003). Der Umstand, dass jedes neue Produkt mit Unsicherheiten behaftet ist und daher seine eigene Diffusion behindert, macht die sogenannten „Early Adopter“ (EA), aber auch „Digital Natives” (DN) zu entscheidenden Adoptionsgruppen. Sie sind nicht nur die ersten Nutzer, die durch ihren Kauf eines neuen Produktes erste Einnahmen für die Unternehmen generieren, sondern auch diejenigen, die den Prozess der Verbreitung durch Mund-zu-Mund-Kommunikation beschleunigen (Arnould, Price, & Zinkhan, 2002; McDonald & Alpert, 2007; Tobbin & Adjei, 2012). Folglich ist es von großer Bedeutung für innovative Technologieunternehmen, diese Konsumenten zu identifizieren und zielgerichtet anzusprechen.

Für eine gezielte Ansprache kommt den ausgewählten Kommunikationskanälen, als Mittel zur Übertragung einer Botschaft von einer Person zu einer anderen, eine übergeordnete Stellung zu. Auch innerhalb des noch zu thematisierenden Prozesses der Innovationsentscheidung lässt sich eine solche Position ausmachen (Rogers, 2003). Das gilt neben den Entscheidungsverfahren für die klassischen Produkt- und Prozessinnovationen (Schumpeter, 1931) auch für Dienstleistungsinnovationen, die sich in erster Linie durch ihre Immaterialität, Verschiedenartigkeit, Untrennbarkeit und Vergänglichkeit auszeichnen (Hill, 1977; Zeithaml, Parasuraman, & Berry, 1985).

Die vorliegende kumulativ angefertigte Dissertationsschrift nutzt die genannten theoretischen Rahmenbedingungen, um mittels der durchgeführten Studien den Prozess der Innovationsentscheidung besser verstehen und steuern zu können. Beginnend werden im Forschungsbeitrag 1 die Charakteristika und das Kommunikationsverhalten der für die Diffusion von technologischen Innovationen entscheidenden Adoptionsgruppe der EA untersucht. Die Zielsetzung ist, eine Grundlage zur Identifizierung bzw. Klassifizierung dieser zu schaffen, bevor ihr Internetnutzungsverhalten mit dem der Mehr-

heit der deutschen Bevölkerung verglichen wird. Der Bedeutung des Internets als Informations- und Kommunikationskanal Rechnung tragend, ist Zielsetzung des anschließenden 2. Forschungsbeitrags zu untersuchen, ob verschiedene Arten negativer eWOM unterschiedlich starke negative Auswirkungen auf die Einstellung der Verbraucher zu einem Produkt haben. Des Weiteren wird analysiert, inwieweit die neue Einstellung im Angesicht darauffolgenden positiven eWOMs unbeeinflusst bleibt.

Für den fortführenden Verlauf des Prozesses der Innovationentscheidung sind Aussagen über Charakteristika der Innovation sowie das individuelle Entscheidungsverhalten eines potenziellen Konsumenten zu treffen. Zur Ergründung hemmender Diffusion neuer Technologien wird deshalb die Akzeptanzforschung thematisiert. Am Beispiel der Finanzdienstleitungsinnovationen des mobilen Bezahlens (MP) und des Social Tradings (ST) soll nach Erklärungen für eine unzureichende Verbreitung dieser Angebote gesucht werden. So besteht das Ziel des 3. Dissertationsbeitrages darin, die moderierende Wirkung generationsspezifischer Unterschiede hinsichtlich technologischer Faktoren auf die Nutzungseinstellung gegenüber MP zu analysieren. Im 4. Beitrag wird thematisch anknüpfend der Forschungsfrage nachgegangen, inwieweit kulturelle Unterschiede zwischen Deutschland und den USA einen Einfluss auf die Verhaltensabsicht zur Nutzung von MP haben. Abschließend wird in Forschungsstudie 5 die Fragestellung ergründet, welche Faktoren die Nutzungsintention potentieller Kunden zum ST bedingen und welche moderierende Rolle den bisherigen Erfahrungen von Konsumenten im Wertpapierhandel in diesem Beziehungskonstrukt zukommt. Die Ergebnisse der Akzeptanzforschungen sollen ein besseres Verständnis der Bedürfnisse und Bedenken potenzieller Konsumenten gegenüber der Innovation und das Ableiten von Implikationen für eine Verbesserung der Angebote ermöglichen.

Nachdem die Ziele der Dissertationsbeiträge kurz umrissen worden sind, sollen diese im folgenden Kapitel weiter konkretisiert und in die Struktur der Ausarbeitungen eingegliedert werden.

1.2 Ziele und Struktur der Dissertationsschrift

Wie dargelegt, hat die vorliegende Dissertationsschrift eine breit gefasste Zielsetzung. Der Untersuchungsschwerpunkt liegt innerhalb der von Rogers (1962; 2003) erstellten Theorie der Innovationsdiffusion auf den verschiedenen Parametern des Prozesses der

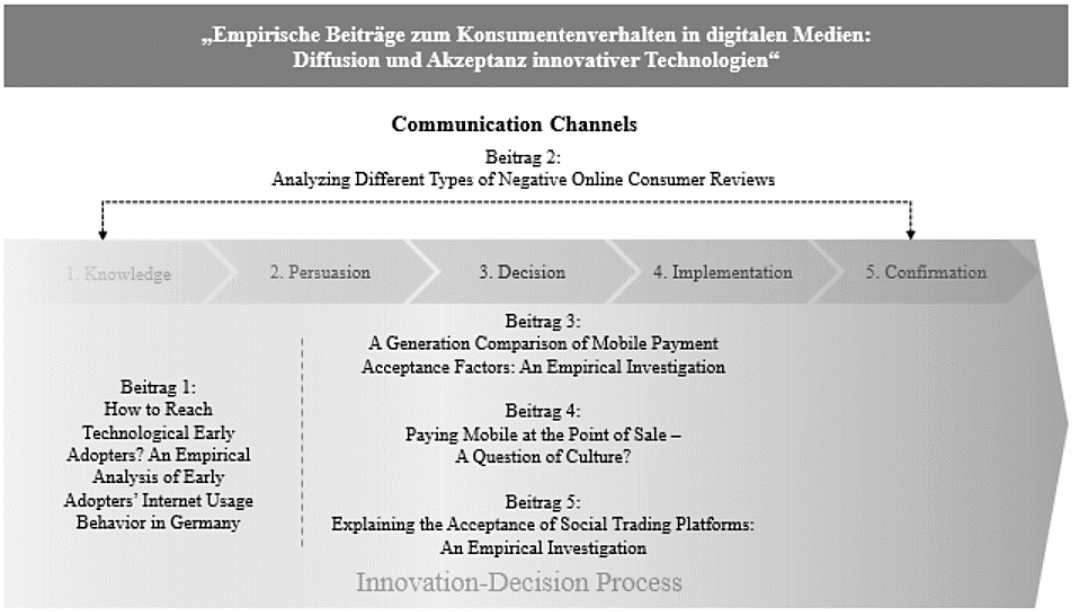
Innovationsentscheidung und der während des Prozesses verwendeten Kommunikationskanäle. Der Fragestellung nach dem Online-Nutzungsverhalten von für die Akzeleration der Verbreitung digitaler Innovationen wichtigen Early Adoptern wird dabei in Forschungsbeitrag 1 Beachtung geschenkt. Insbesondere deren Nutzung des Internets als Kommunikationskanal ist von übergeordnetem Interesse, da der Einfluss elektronischer Mund-zu-Mund-Kommunikation auf die Produkteinstellung und die Kaufentscheidung der Verbraucher wächst (u. a., Brown, Broderick, & Lee, 2007; Tang, 2017). Nach der „negativity bias theory" wird insbesondere dem negativen eWOM während des Kaufentscheidungsprozesses eine hohe Gewichtung beigemessen (u. a., Rozin & Royzman, 2001). Im Forschungsbeitrag 2 wird daher der Frage nachgegangen, inwiefern negatives eWOM grundsätzlich einen nachteiligen Einfluss auf die Produkteinstellung der Kunden hat und wie nachhaltig dieser schädliche Einfluss zu bewerten ist.

Besonders im Bereich marktreifer digitaler Finanzdienstleistungsinnovationen sind durch das Aufkommen vieler Startups eine große Dynamik und Marktveränderungen zu erkennen (Gomber et al., 2018; Lee & Shin, 2018). In Deutschland zeigt sich jedoch gerade auf dem Gebiet der Finanzindustrie eine äußerst zögerliche Adoption vieler Angebote (Moritz & Mietzner, 2019), da sich hiesige Verbraucher in diesem Umfeld oftmals konservativ verhalten. Zwei Ausprägungen digitaler Anwendungen im Finanzdienstleistungsbereich, die in Deutschland bisher keine flächendeckende Verbreitung finden, sind das MP und ST (Schwarzer, 2017; Splendid Research, 2018; Statista, 2019). Um mögliche Ursachen der ausbleibenden Diffusion bzw. Adoption zu ergründen, sollen Untersuchungen zur Akzeptanz gegenüber diesen Dienstleistungen durchgeführt werden. Im Gegensatz zur Adoption ist die Akzeptanz eine spezifische Einstellung gegenüber einer Technologie und wird von verschiedenen Faktoren beeinflusst. Eine vollständige Adoption bedingt gegenüber der Innovation immer auch eine gewisse Akzeptanz (Biljon & Renaund, 2008). Zielsetzung der Forschungsbeiträge 3 bis 5 ist es demnach, Ursachen für die ausbleibende Adoption dieser Dienstleistungen zu erforschen, indem akzeptanzstiftende Eigenschaften untersucht werden. Dabei finden die Einflüsse von Soziodemografie, kulturellem Hintergrund und kontextspezifisch gemachten Erfahrungen besondere Berücksichtigung.

Um den Fragestellungen nachzukommen, gliedert sich die Dissertationsschrift in 5 Beiträge. Die ersten beiden Artikel beziehen sich auf wichtige Entscheidungseinheiten

für den Diffusionsprozess sowie das Internet als zentralen Kommunikationskanal. Für den folgenden Verlauf des Prozesses der Innovationentscheidung sind Aussagen über Innovationscharakteristika sowie das individuelle Entscheidungsverhalten zu treffen. Zur Ergründung hemmender Diffusion von Finanzdienstleistungsinnovation widmen sich die weiteren drei Arbeiten der Akzeptanzforschung. Folgende Abbildung 1 gibt einen strukturierten Überblick über die der Dissertationsschrift zu Grunde liegenden Beiträge in Bezug auf den Prozess der Innovationsentscheidung.

Abbildung 1. Struktur der Dissertationsschrift, in Anlehnung an Rogers (2003)



Der in obiger Grafik dargestellte Prozess der Innovationsentscheidung gilt als theoretischer Rahmen dieser kumulativen Dissertationsschrift, da die 5 angefertigten Forschungsbeiträge wichtige Elemente der Innovationsentscheidung abbilden. Nach Rogers (2003) beschreibt der Prozess den zeitlichen Entscheidungsverlauf eines Individuums von der ersten Kenntnisnahme einer Innovation (1. Knowledge), über die Bildung einer Einstellung gegenüber dieser (2. Persuasion), der tatsächlichen Entscheidung zur Übernahme oder Ablehnung der Innovation (3. Decision), die reale Verwendung der Innovation (4. Implementation) bis hin zur Bestätigung oder Ablehnung der getroffenen Entscheidung (5. Confirmation). Die übergeordnete Rolle der Kommunikation ist bereits durch die Definition der Diffusion ersichtlich geworden und auch innerhalb des Prozesses der Innovationsentscheidung existent. Verschiedene Kommunikationskanäle haben in jeder Phase des Prozesses und für jede Adoptionsgruppe eine unterschiedliche Bedeutung (Rogers, 2003).

Da die Massenmedien sehr wichtig sind für die erste Phase des Prozesses der Innovationsentscheidung sowie für die Ansprache von Early Adoptern, widmet sich Forschungsbeitrag 1 der Identifizierung und Analyse der Internetnutzung dieser Adoptionsgruppe. Die ist deshalb entscheidend, weil EA für den Diffusionsprozess von Innovationen eine wesentliche Kundengruppe darstellen (Rogers, 2003). Die Sinnhaftigkeit der oftmals verwendeten zeitabhängigen Konzepte zur Erkennung dieser Gruppe (u. a., Lynn et al., 2017; Moldovan, Steinhart, & Ofen, 2015; Reinhardt & Gurtner, 2015; Rogers, 2003) findet vermehrt Kritik (McDonald & Alpert, 2007; Midgley & Dowling, 1978). Diese Kritik zum Anlass nehmend, wird ein neuer Ansatz zur Profilierung von EA angewandt. Auf Grundlage bestehender Forschung werden neben dem Grad der technologischen Innovationsfähigkeit (Bruner, Kumar, & Heppner, 2007) zusätzlich die unabhängige Entscheidungsfindung (Midgley & Dowling, 1978) sowie die Meinungsführerschaft (Goldsmith & Witt, 2003) als Selektionskriterien herangezogen, da sie wesentliche Elemente der Beschleunigung des Diffusionsprozesses technologischer Innovationen darstellen (Bass, 1969, 2004). Nachdem die Kundengruppe der EA identifiziert werden konnte, wird ihr Internetnutzungsverhalten mit dem der Mehrheit der deutschen Bevölkerung verglichen. Dazu werden, in Anlehnung an Blank und Groselj (2014), 15 verschiedene Internetanwendungen in die Kategorien „Informationsquelle“, „Kommunikationskanal“ und „spezifische Services“ geclustert. Anhand der drei Anwendungskategorien kann daraufhin der Nutzungsvergleich durchgeführt werden. Des Weiteren werden Unterschiede in der mobilen Nutzung des Internets sowie Geschlechterdifferenzen innerhalb der Gruppe der EA hinsichtlich der Nutzung des Internets als Kommunikationsplattform untersucht.

EA können als Kundengruppe identifiziert werden, die das Internet hoch frequentiert und verstärkt als Kommunikations- und Informationskanal nutzen. Diese primäre Verwendung verdeutlicht die zunehmende Bedeutung des eWOM, das die Möglichkeiten des Verbrauchers, Produktinformationen über andere Nutzer zu sammeln und eigene konsumbezogene Ratschläge zu erteilen, fundamental erweitert (Hennig-Thurau et al., 2004). Die beobachtete Entwicklung unterstreicht den von Rogers (2003) skizierten allumfassenden Einfluss des Kommunikationskanals auf jeden Prozessschritt der Innovationsentscheidung. Allerdings hat nicht jedes eWOM die gleichen Auswirkungen auf das Verbraucherverhalten. Eine in der Forschung nachweislich stärkere Gewichtung negativer Informationen innerhalb des Kaufentscheidungsprozesses (negativity

bias) (u. a., Rozin & Royzman, 2001) führte zu einer ausführlichen Untersuchung dieses Phänomens. Eine nähere Betrachtung des Zusammenhangs verschiedener Inhaltstypen negativen eWOMs auf die Einstellung zu einem beschriebenen Produkt blieb bisher jedoch aus. Der Forschungsbeitrag 2 setzt an dieser Stelle an und erweitert die vorhandene Literatur, indem die Auswirkungen verschiedener Arten negativer Online-Reviews auf die Einstellung zu einem Produkt analysiert werden. Zu diesem Zweck werden die Inhaltsebenen der konstruktiv funktionalen, konstruktiv ethischen sowie emotional destruktiven Kritik unterschieden.

Konsumenten werden während ihres Prozesses der Kaufentscheidung in der Regel nicht nur mit negativen Informationen konfrontiert (Purnawirawan, Eisend, De Pelsmacker, & Dens, 2015). Sollten die verschiedenen Arten negativen eWOMs divergierende Effekte auf die Einstellung zum Produkt verursachen, stellt sich daher weiterführend die Frage nach der Robustheit dieser evozierten Einstellungsänderung infolge anschließender positiver Rezensionen. Zusammenfassend fokussiert Forschungsbeitrag 2 demnach das Internet als Kommunikationskanal und soll Erkenntnisse darüber liefern, welche Art von negativen Online-Kommentaren den stärksten Einfluss auf die Verbrauchereinstellung provoziert und welche Art von Kritik am schwierigsten zu revidieren ist.

Weiterführend sind für den Verlauf des Prozesses der Innovationentscheidung Aussagen über Innovationscharakteristika (2. Persuasion) sowie das individuelle Entscheidungsverhalten (3. Decision) zu treffen. Zur Ergründung hemmender Diffusion neuer Technologien steht deshalb in den Forschungsbeiträgen 3 bis 5 die Akzeptanzforschung gegenüber digitalen Finanzdienstleistungsinnovationen im Vordergrund. Dieses Vorgehen lässt zugleich Aussagen über die tatsächliche Verwendung einer Innovation zu (4. Implementation).

Zum Zeitpunkt der durchgeführten Untersuchungen ist weder dem mobilen Bezahlen am stationären Verkaufsort (proximity MP – vereinfacht im Folgenden nur MP) noch dem Social Trading in Deutschland der flächendeckende Durchbruch gelungen (Schwarzer, 2017; Splendid Research, 2018; Statista, 2019). Das MP ist durch eine physische Präsenz des Kunden sowie eine notwendige Infrastruktur im Handel gekennzeichnet (Slade, Williams, Dwivedi, & Piercy, 2015; Smart Card Alliance, 2007). Es definiert sich als Zahlungstransaktion, bei der ein mobiles Endgerät zur Initiierung, Autorisierung, Bestätigung und zum Zahlungsabschluss verwendet wird (Chandra,

Srivastava, & Theng, 2010; Goeke & Pousttchi, 2010).

Unter Social Trading wird das gemeinsame Handeln einer Community am Finanzmarkt verstanden. Dabei ermöglicht eine ST-Plattform den Aufbau von Verbindungen zwischen Investoren innerhalb einer Online-Community. Die Nutzer können bisherige Handelsschritte sowie die Performance anderer Nutzer vollumfänglich begutachten und deren Investitionsstrategien automatisch, simultan sowie unbeschränkt nachbilden. Dieses Vorgehen wird „Copy Trading" genannt (Pelster, 2017; Wohlgemuth, Berger, & Wenzel, 2016).

Aufgrund der fehlenden Adoption dieser innovativen Dienstleitungen ergeben sich die Forschungsmotive dahingehend, bestehende Forschungslücken in diesem Bereich zu schließen und die einstellungs- bzw. verhaltensrelevanten Faktoren zur Nutzung von MP sowie ST zu bestimmen. Im Vordergrund stehen dabei insbesondere Moderatoreffekte, die auftreten, wenn eine Variable (sog. „Moderatorvariable“) den Effekt zwischen einer abhängigen und einer unabhängigen Variable beeinflusst (Urban & Mayer, 2018). So wird im Forschungsbeitrag 3 die moderierende Wirkung generationsspezifischer Unterschiede hinsichtlich technologischer Faktoren auf die Nutzungseinstellung gegenüber MP untersucht. Unterschieden wird auf Grundlage Prenskys (2001) Generationenkonzept nach Digital Natives (DN) und Digital Immigrants (DI). Erweiterung findet dieser Ansatz im Forschungsbeitrag 4 in Bezug auf kulturelle Unterschiede zwischen zwei westlichen Industrienationen. Da dem kulturellen Hintergrund einer Gesellschaft eine entscheidende Rolle bei der Adoption neuer Technologien zukommt (Lee, Trimi, & Kim, 2013), ist das Verständnis der kulturellen Unterschiede für die Gestaltung von innovativen Finanzdienstleistungen von wesentlicher Bedeutung. Durch einen Vergleich mit den Vereinigten Staaten von Amerika (USA), in denen MP bereits große Verbreitung findet, soll der Einfluss kultureller Besonderheiten auf das Beziehungsgeflecht innerhalb eines Akzeptanzmodells die ungleich verlaufende Diffusionskurve erklären. Der abschließende Forschungsbeitrag 5 richtet den Fokus auf das ST. Aufgrund des noch jungen Alters des Forschungszweiges ist es das Ziel dieser Studie, ein erstes Akzeptanzmodell aus der Perspektive des potenziellen Kunden zu entwickeln und empirisch zu validieren. Da sich das Angebot der Plattformen sowohl an erfahrene als auch unerfahrene Wertpapierhändler richtet, sollen durch einen Vergleich beider Gruppen spezifische Bedürfnisse beider Nutzertypen ausfindig

gemachten werden. Daraus ableitend können Empfehlungen zur Verbesserung der jeweiligen Systeme für die größtmögliche Anzahl von Kunden ausgesprochen werden.

1.3 Zugrundeliegende theoretische Grundlagen und Methodik

1.3.1 Theoretische Grundlagen

Die breit angelegte Zielsetzung spiegelt sich auch in den zugrundeliegenden methodischen Grundlagen wider. Während sich die Forschungsbeiträge 1 und 2 noch grundlegend hinsichtlich der theoretischen Basis unterscheiden, basieren die Beiträge 3 bis 5 auf den Grundlagen der quantitativen Akzeptanzforschung.

Wie einführend bereits erwähnt, besteht das Hauptaugenmerk der gemachten Ausarbeitungen auf der Diffusion, Adoption und Akzeptanz innovativer Technologien. Selbst bei Vorliegen offensichtlicher Vorteile gegenüber bestehenden Lösungen ist eine flächendeckende Adoption eines neuen Produktes oder einer Dienstleistung nicht selbstverständlich. Everett Rogers (1962) hat den theoretischen Diskurs der Diffusion von Innovationen popularisiert. Er postuliert, dass die individuelle Entscheidung potenzieller Nutzer zur Adoption einer Innovation nicht simultan erfolgt, sondern zeitverzögert. Um den Diffusionsprozess verstehen und beeinflussen zu können, ist es demzufolge entscheidend, die adoptierenden Personen einer Innovation kategorisieren zu können. Hierzu klassifizierte Rogers Individuen innerhalb eines sozialen Systems auf der Grundlage ihrer zeitlichen Adoption in fünf Kategorien (Innovators, Early Adopters, Early Majority, Late Majority und Laggards). Demnach können Innovatoren und EA als verschiedene Gruppen betrachtet werden. In der vorliegenden Dissertation soll jedoch dem Beispiel zahlreicher Autoren gefolgt werden, die Innovatoren und EA synonym unter dem Begriff EA zusammenfassen (u. a., Laukkanen & Pasanen, 2008; Lynn et al., 2017; Reinhard & Gurtner, 2015). Der Kauf eines neuen Produktes ist stets mit spezifischen Unsicherheiten behaftet. Aufgrund erster Produkterfahrungen und ihrer Bedeutung für die virale Verbreitung dieser Eindrücke spielen deshalb insbesondere die ersten Nutzer von Innovationen eine entscheidende Rolle im Prozess der Verbreitung (Arnould et al., 2002; McDonald & Alpert, 2007; Tobbin & Adjei, 2012). Damit diese unabhängig von ihrer zeitlichen Adoption einer Innovation zu identifizieren sind, ist der Kritik von McDonald und Alpert (2007) gefolgt und technologische EA anhand ihrer Persönlichkeitsmerkmale selektiert worden. Da der Fokus innerhalb

der Dissertationsschrift auf dem Bereich der technologischen Innovationen liegt, sind die Ausprägung der drei Persönlichkeitsmerkmale technologische Innovationskraft (Bruner et al., 2007), unabhängige Entscheidungsfindung (Midgley & Dowling, 1978) und Meinungsführerschaft (Goldsmith & Witt, 2003) zur Definierung eines technologischen EA herangezogen worden. Diese Eigenschaften beschleunigen den Diffusionsprozess technologischer Innovationen (Bass, 1969, 2004), weshalb ein EA fortan als ein Verbraucher definiert wird, der ein hohes Potenzial zur Akzeleration der Diffusion technologischer Innovationen aufweist (Bruner & Kumar, 2007).

Gemäß Bass (1969) und Rogers (2003) kommt dem Kommunikationsaspekt für die Adoption neuer Produkte eine entscheidende Bedeutung zu. Deshalb wird weiterführend die Auswirkung negativer Online-Kommunikation auf die Konsumenteneinstellung zu einem technologischen Produkt untersucht. Dies geschieht auf Grundlage der „Search and Alignment Theory“ von Muthukrishnan und Pham (2002) sowie des Primacy-Recency-Effekts. Erstgenannte Theorie beschreibt die Wirkung gegenteiliger Informationen auf die Revision der Einstellung. Sie betrachtet den Prozess der Revision eines ursprünglichen Gedankenbildes durch neu gewonnene Informationen, die der anfänglichen Vorstellung widersprechen. Die „Search and Alignment Theory“ ist für die Untersuchung bestens geeignet, da sie bereits im Kontext negativen eWOMs empirische Anwendung fand, um Effekte auf den konsumentenbasierten Markenwert zu erklären (Bambauer-Sachse & Mangold, 2011). Zur theoretischen Einordnung der Frage nach der Stabilität der neu gewonnenen Einstellung in Anbetracht der anschließenden Konfrontation mit positiven eWOM dient der „Primacy-Recency-Effekt“ als theoretisches Fundament. Demzufolge wird entweder der zuerst (u. a., Gibbons, Velkey, & Partin, 2008) oder der zuletzt eingehenden Information (u. a., Garnefeld & Steinhoff, 2013) mehr Gewicht beigemessen als den dazwischenliegenden. Weiterführend kann das Elaboration Likelihood Model (ELM) von Petty und Cacioppo (1968) als Erklärungsansatz für einen Teil der gewonnenen Ergebnisse herangezogen werden. Das ELM ist eine der wichtigsten Theorien der Informationsverarbeitung und gibt an, inwiefern persuasive Kommunikation Konsumenten beeinflussen kann (Yan et al., 2016; Cheung & Thadani, 2012). Nach Ansicht des ELM bestimmen spezifische Merkmale der erhaltenen Informationen die Motivation der Verbraucher, diese zu verarbeiten. Die Informationsverarbeitung kann hinsichtlich ihrer Wirkung auf eine Einstellungsänderung in zwei antagonistische Arten, entweder die zentrale oder periphere

Route, unterschieden werden (Petty & Cacioppo, 1986).

Wie erwähnt, unterscheiden sich die theoretischen Grundlagen von den ersten beiden Forschungsbeiträgen grundlegend. Die weiteren drei Dissertationsbeiträge fokussieren sich auf die Akzeptanzforschung gegenüber technologischen Finanzdienstleitungsinnovationen. Da die Akzeptanz einer Innovation maßgeblich für eine erfolgreiche Markteinführung ist (Chiesa & Frattini, 2011), widmen sich die Beiträge der Akzeptanz von MP sowie ST. Diese beiden Finanzdienstleistungen können als Beispiele für bisher nicht erfolgreich am Markt eingeführte Innovationen angesehen werden.

Die Forschungsbeiträge 3 und 4 untersuchen das Themenfeld MP. Damit ein umfangreicheres Verständnis zur bisher geringen Akzeptanz dieser Dienstleistung in Deutschland erlangt werden kann, muss der Frage nach den Bestimmungsfaktoren für eine Marktdurchdringung nachgegangen werden. So ist anzunehmen, dass sich neben behavioristischen Determinanten ebenfalls demografische Faktoren, wie das Alter (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014), und kulturell bedingt Unterschiede auf die Nutzungsbereitschaft von MP auswirken (Guhr, Loi, Wiegard, & Breitner, 2013). Da diese Einflussfaktoren zugleich zur Charakterisierung verschiedener Generationen der heutigen Gesellschaft beitragen, lassen sich generationsspezifische Akzeptanzunterschiede im Kontext von MP vermuten. Dieser Fragestellung nachgehend, wird Prenskys (2001) Generationenansatz der Digital Natives und Digital Immigrants (DI) als Moderator innerhalb eines modifizierten "Technology Acceptance Model" (TAM) (Davis, 1989) verwendet. Prensky (2001) berücksichtigt bei der Gruppierung der Generationen im besonderen Maße die zunehmende Integration digitaler Technologie in den Alltag. Dementsprechend unterscheiden sich Individuen, die vor (DI) bzw. nach (DN) dem Anbruch des digitalen Zeitaltes aufgewachsen sind, hinsichtlich ihrer Wertevorstellungen, Denkweisen und Lebensgestaltung. Als zeitliche Trenngrenze dieser dichotomen Untergliederung nennt Prensky (2001) den Geburtsjahrgang 1980. Je nachdem, ob ein Individuum mit digitalen Technologien aufgewachsen ist oder nicht, unterscheidet sich seine Einstellung zur Nutzung neuer Technologien (Dahlberg & Öörni, 2007; Gurtner, Reinhardt, & Soyez, 2014). Die sich hieraus ergebenen Erkenntnisse sollen in der Akzeptanzforschung zum MP Berücksichtigung finden. Ein im Zusammenhang mit dem beschriebenen Generationsansatz bewährtes Modell der Technologieakzeptanzforschung stellt das TAM dar (u. a., Metallo & Agrifoglio, 2015).

Das TAM von Davis (1989) basiert auf der Theory of Reasoned Action von Ajzen und Fishbein (1980) und ist ein äußerst übersichtliches und robustes Model zur Bestimmung der Nutzungsakzeptanz technologischer Innovationen. Diese Eigenschaften machen es zu einem der am häufigsten genutzten Modelle zur Erklärung der Kundenakzeptanz gegenüber neuer technologischer Systeme (u. a., Bouwman, Kommers, & van Deursen, 2014; Lai, 2017; Lee, Trimi, & Kim 2013). Es ist nicht nur mit dem Generationsansatz von Prensky (2001) kompatibel, sondern bereits für die Untersuchung der Adoption von MP angewandt worden (Arvidsson, 2014; Bernet, 2014; Dahlberg & Öörni, 2007; Keramati, Taeb, Larijani, & Mojir, 2012; Liébana-Cabanillas et al., 2014). Laut TAM ist die Entscheidung zur Akzeptanz einer neuen Technologie von zwei entscheidenden subjektiven Variablen abhängig: der wahrgenommenen Nützlichkeit sowie der wahrgenommenen Bedienungsfreundlichkeit. Diese beiden Faktoren beeinflussen die Einstellung des Individuums zur Nutzung einer Technologie, welche zusammen mit der wahrgenommenen Nützlichkeit wiederum Einfluss auf die Verhaltensabsicht haben. Schließlich bedingt die Verhaltensabsicht die tatsächliche Nutzung (Park, 2009). Da verschiedene Untersuchungen den positiven Zusammenhang zwischen Einstellung, Verhaltensabsicht und tatsächlicher Nutzung bestätigt haben (u. a., Meharia, 2012; Schierz, Schilke, & Wirtz, 2010) und bisher keine flächendeckende Verbreitung dieser digitalen Bezahlmethode in Deutschland stattgefunden hat, wird in Forschungsbeitrag 3 und 4 davon abgesehen, die tatsächliche Nutzung von MP zu untersuchen. So werden in Beitrag 3 die Nutzungseinstellung und in Artikel 4 die Verhaltensabsicht zur Nutzung als abhängige Variable untersucht.

Das ursprüngliche TAM wurde konzipiert, um eine allgemeingültige Erklärung zu akzeptanzstiftenden Determinanten von Computern zu liefern. Es sollte jedoch in der Lage sein, das Nutzungsverhalten über ein breites Spektrum von endnutzerbezogenen Computertechnologien zu erklären (Davis, Bagozzi, & Warshaw, 1989). Trotz oder gerade wegen dieses breiten Anwendungsspektrums der Theorie ist es unabdingbar, das Modell auf die Zielsetzungen der Artikel und den Untersuchungsgegenstand des MP anzupassen bzw. zu erweitern. Dieser Ansatz folgt der Forderung von Bagozzi (2007), zusätzliche Forschungsmodelle zu implementieren und zu validieren, die das TAM durch Einfügen neuer Variablen erweitern und vertiefen. In Forschungsbeitrag 3 wird, in Anlehnung an Schierz und Wirtz (2009) und aufgrund ihrer großen Relevanz

für den Zahlungsverkehr (Henkel, 2001; Levente & Sandor, 2016), die wahrgenommene Sicherheit ins Forschungsmodell integriert. Für den Kulturvergleich in der Dissertationsschrift 4 werden, auf Grundlage einer umfassenden Literaturanalyse und unterstützt durch die Beobachtung von Mondego und Gide (2018) sowie Dahlberg, Guo und Ondrus (2015), weitere, die Adoption von MP beeinflussende, Faktoren ergänzt. So werden vertrauensbezogene (Vertrauen in MP, wahrgenommene Datensicherheit, wahrgenommenes Betrugsrisiko) und soziale Aspekte (sozialer Einfluss und technologische Innovationsfreudigkeit) hinzugenommen. Die Auswahl der Variablen ist zusätzlich in Abhängigkeit von zu erwartenden kulturellen Unterschieden zwischen den analysierten Ländern getroffen worden. Zur Erforschung solcher kulturellen Unterschiede ist der Einfluss von Hofstedes (1980) Werk "Culture's Consequences" allgegenwärtig. Sein theoretischer Rahmen ist der gängigste und geeignetste Ansatz zur Untersuchung interkultureller Unterschiede im Bereich der Forschung zu Technologie- und Informationssystemen (Dinev, Goo, Hu, & Nam, 2009; Lee et al., 2013; Taras, Rowney, & Steel, 2009). Hofstede unterscheidet sechs bipolare Dimensionen, die zur Grundlage der Charakterisierung einer Kultur herangezogen werden können (Hofstede, 2011) und bereits oftmals als Moderatoren innerhalb des TAM Anwendung fanden (u. a., Straub, Keil, & Brenner, 1997; Zakour, 2004). Für den vorgenommenen Vergleich zwischen Deutschland und den USA werden nur die Kulturdimensionen als Moderatoren verwendet, in denen sich die zu analysierenden Nationen deutlich voneinander unterscheiden (Individualismus vs. Kollektivismus; Unsicherheitsvermeidung; Lang- vs. Kurzzeitorientierung) (Hofstede, 2011).

Zur empirischen Auseinandersetzung mit dem Themenfeld Social Trading (Forschungsbeitrag 5) wird vom ursprünglichen TAM Abstand genommen. Dazu wird die von Venkatesh et al. (2003) implementierte und empirisch validierte Vereinheitlichung diverser technologsicher Akzeptanzmodelle, die “Unified Theory of Acceptance and Use of Technology“ (UTAUT), als theoretische Grundlage verwendet. Sie ist das Ergebnis einer Analyse und eines empirischen Vergleichs der “Theory of Reasoned Action” (Fishbein & Ajzen, 1975), “Social Cognitive Theory” (Bandura, 1986), TAM (Davis, 1989), “Theory of Planned Behavior” (Ajzen, 1991), des “Model of PC Utilization” (Thompson, Higgins, & Howell, 1991), “Motivational Model” (Davis, 1989), der “Innovation Diffusion Theory” (Rogers, 1995) und des “C-TAM-TPB Research Model” (Taylor & Todd, 1995). Um die Verhaltensabsicht zur Nutzung einer

bestimmten Technologie vorherzusagen, identifizierten Venkatesh et al. (2003) vier Konstrukte: “performance expectancy”, “effort expectancy”, “social influence” und “facilitating conditions”. Im Forschungsbeitrag 5 wird die Grundstruktur der UTAUT verwendet und auf den spezifischen Untersuchungsgegenstand des ST angepasst. Dabei wird sich auf die Plattformkategorisierung von Kane et al. (2014) sowie auf die bisherige Literatur zur finanziellen Entscheidungsfindung im Kontext von Informationssystemen gestützt. Auf dieser Grundlage wird die ursprüngliche Variable „social influence“ durch „advice suitability“ und „facilitating conditions“ durch „perceived security“ ersetzt. Damit die Nutzungsabsicht zum ST adäquat untersucht werden kann, wird das UTAUT zusätzlich mit einer entscheidenden Variable aus der Literatur zur finanziellen Entscheidungsfindung erweitert. So wird der individuellen „risk aversion“, insbesondere auf ST-Plattformen, eine große Relevanz beigemessen (Berger, Wenzel, & Wohlgemuth, 2018; Pelster & Breitmayer, 2019).

Da ST-Anbieter versuchen, ihren Service einer möglichst breiten Kundenbasis anzubieten, zu denen insbesondere auch weniger wohlhabende und unerfahrene Kunden gehören, werden zudem potenzielle Kunden mit und ohne vorherige Erfahrungen im Wertpapierhandel verglichen. Bisherige Erkenntnisse, die zeigen, dass sich die Vorstellungsmuster unerfahrener Nutzer von denen der erfahrenen Nutzer unterscheiden, stützen dieses Vorgehen (Karahanna, Straub, & Chervany, 1999; Venkatesh et al., 2003).

1.3.2 Methodik

Ein besonderes Merkmal der vorliegenden kumulativen Dissertationsschrift ist die Verwendung eines breiten Methodenspektrums. Es wird großen Wert darauf gelegt, verschiedenartige empirische Verfahren anzuwenden, um der Komplexität der Zielsetzungen vorliegender Ausarbeitungen gerecht zu werden. Der Fokus liegt auf einem quantitativ-deskriptiven Forschungsansatz. Daneben wird zusätzlich ein experimentelles Design als Untersuchungsmethode herangezogen. Auch die Bandbreite der Auswertungsverfahren ist vielfältig. So werden univariate sowie multivariate Datenanalysen vorgenommen. Neben einem t-Test, als univariates Testverfahren, werden zudem Varianz- und Regressionsanalysen sowie Strukturgleichungsmodellierungen, als multivariate Analysemethoden, berechnet.

Forschungsbeitrag 1 basiert auf einer sehr großen Stichprobe von 119.829 quantitativ

erhobener Befragungseinheiten eines bekannten deutschen Meinungsforschungsinstituts. Zur Vorbereitung auf die Hypothesentests werden die verschiedenen Internetkanäle, dessen Nutzungsintensität erfragt werden, in Anlehnung an Blank und Groselj (2014), in drei Kategorien geclustert. Da die Nutzungsintensität auf ordinären Messskalen abgefragt wird, kommen für den Vergleich der EA mit der Mehrheit der deutschen Bevölkerung die nichtparametrischen Tests Mann-Whitney-U-Test und Welch-Test (Welch, 1938) zur Anwendung. Der Empfehlung von Rasch et al. (2011) folgend, wird der Welch-Test anstelle eines Student`s t-Test verwendet. Dieses Verfahren weist mehr Kontrolle über den Fehler 1. Art aus als ein flexibler Ansatz, der zwischen dem Student's t-Test und dem Welch-Test entsprechend der Gleichheit oder Ungleichheit der Varianzen wechselt (Ruxton, 2006).

Um die Fragestellungen des Forschungsbeitrags 2 bezüglich der Auswirkungen unterschiedlicher Arten negativen eWOMs zu ergründen, wird ein experimentelles Setting in Form einer quantitativen Online-Befragung umgesetzt. Die verwendete Form zeichnet sich durch eine randomisierte Vorher-Nachher-Messung dreier Experimentalgruppen unter Einbezug einer Kontrollgruppe aus. Die drei Experimentgruppen werden jeweils einem der drei manipulierten Stimuli (verschiedenen Arten negativer Kundenrezensionen) ausgesetzt, während die Kontrollgruppe ohne diese Manipulation auskommt. Zusammenfassend kommt ein randomisiertes faktorielles Design mit wiederholten Messungen und drei unabhängigen Variablen (konstruktive, ethische und destruktive Kritik) sowie einer abhängigen Variable (Produkteinstellung) zur Anwendung. Auf Grundlage dieses between-subjects Design können die unterschiedlichen Gruppen hinsichtlich ihrer Einstellung zum Untersuchungsgegenstand (Laptop) untersucht werden. Um die Konsistenz der Einstellungsänderung zu prüfen und eine Aussage darüber treffen zu können, welche Art im Internet geäußerter Kritik am schwierigsten zu revidieren ist, wird im zweiten Teil der Erhebung auf ein mixed between-within subjects Design zurückgegriffen. An dieser Stelle werden nicht nur die einzelnen Gruppen miteinander verglichen, sondern auch Veränderungen innerhalb der Gruppen betrachtet.

Multivariate Analysemethoden bestimmen das Vorgehen der Forschungsbeiträge 3 bis 5. Die dazu modellierten Forschungsmodelle werden hinsichtlich ihrer korrelativen Zusammenhänge zwischen abhängigen und unabhängigen Variablen überprüft. Da die

Untersuchungsschwerpunkte darauf fixiert sind zu bestimmen, ob eine bestimmte Variable (Moderatorvariable) die Größe der Wirkung einer Prädiktorvariable (unabhängige Variable) auf eine Kriteriumsvariable (abhängige Variable) beeinflusst, gelten Moderationsanalysen als geeignete Analyseform (Baron & Kenny, 1986; Hayes, 2013). Im Fall des Forschungsbeitrags 3 wird hypothetisiert, dass die Zugehörigkeit zu einer Generation als Moderator anzusehen ist. Die statistische Analyse muss demnach den differentiellen Effekt der unabhängigen auf die abhängige Variable als Funktion des Moderators messen (Baron & Kenny, 1986). Zu diesem Zweck wird ein Interaktionsterm als multiplikative Verbindung zwischen der jeweiligen unabhängigen Variablen und der Generationszugehörigkeit – operationalisiert als dichotome Dummy-Variable 0/1 – gebildet und in das Regressionsmodell integriert (Aiken & West, 1991; Cohen & Cohen, 2003). Ein Moderatoreffekt tritt auf, wenn der Interaktionsterm innerhalb der Regressionsanalyse sowie die Veränderung der Menge der erklärten Varianz der abhängigen Variable signifikant sind (Aiken & West, 1991; Cohen & Cohen, 2003; Hayes, 2013).

Da in den Forschungsbeiträgen 4 und 5 nicht nur Moderationseffekte, sondern auch auf bestehenden Theorien basierte komplexe Zusammenhänge zwischen Variablen in einem linearen Gleichungssystem untersucht werden, werden zur Validierung der Beziehungsverflechtungen kovarianz-basierte Strukturgleichungsmodelle verwendet. Dies führt im Vergleich zum Forschungsbeitrag 3 zu einem divergierenden Vorgehen bei den Moderatoranalysen.

Die Untersuchung des Kulturvergleichs im Forschungsbeitrag 4 orientiert sich an einem von Chin (2000) vorgeschlagenen Verfahren zur Berechnung eines Moderatoreffektes. Nach diesem kann ein eben solcher Effekt durch den Vergleich der Pfadkoeffizienten jeder Gruppe analysiert und paarweise t-Tests zur Überprüfung der Signifikanz berechnet werden. Hierzu wird in einem ersten Schritt ein Test auf Invarianz, durch einen χ^2 Wertevergleich (und die Freiheitsgrade) für das unrestringierte Modell und das vollständig restringiertes Modell, durchgeführt. Da die Standardfehler in beiden Gruppen ungleich waren, schlägt Chin (2000) zur Berechnung der Moderation die Verwendung eines t-Test auf Grundlage der nicht standardisierten Pfadkoeffizienten und der entsprechenden Standardfehler vor.

Um den moderierenden Einfluss der Erfahrungen im Wertpapierhandel auf die Nut-

zungsabsicht von Social Trading zu untersuchen, wird auf eine Mehrgruppen-Kausalanalyse innerhalb eines Strukturgleichungsmodells zurückgegriffen. Dieses Vorgehen berücksichtigt im Vergleich zu einer moderierten Regressionsanalyse die Beziehung zwischen latenten Konstrukten (Homburg & Giering, 2001). Äquivalent zum oben bereits beschriebenen Vorgehen müssen die Modelle hinsichtlich ihres χ^2 Unterschiedes, der als Indikator für Unterschiede der Modelanpassung dient, verglichen werden. Dazu wird ein unrestringiertes Modell mit einem Modell verglichen, in dem der Parameter dessen Nicht-Invarianz getestet werden soll restringiert wird. Um zu analysieren, wie sich der χ^2 Wert verändert, wird demnach ein Modell als Basismodell festgelegt und der jeweilige Beta-Koeffizient dieses Modells durch den entsprechenden Beta-Schätzer des Referenzmodells restringiert. Die Signifikanz der Differenz des χ^2 zwischen dem vorher frei geschätzten und des restringierten Modells gibt Aufschluss über einen Moderationseffekt.

1.4 Ergebnisse der konstitutiven Beiträge der Dissertationsschrift

Die Bedeutung der EA für den Prozess der Innovationsentscheidung ist im Rahmen dieser Synopsis hinlänglich erläutert worden. Für den Diffusionsprozess innovativer Technologien ergibt sich daraus eine besondere Relevanz der von dieser Gruppe genutzten Medien. Deshalb ist es so wichtig, EA möglichst präzise identifizieren zu können. Im Forschungsbeitrag 1 wird hierzu eine Klassifizierung nach dem Grad der technologischen Innovationsfähigkeit (Bruner et al., 2007), dem Treffen unabhängiger Entscheidungen (Midgley & Dowling, 1978) sowie der Meinungsführerschaft (Goldsmith & Witt, 2003) geprüft. Zur Verifizierung dieses Selektionsansatzes wurden die demografischen Merkmale der ausgewählten potenziellen EA mit den Resultaten bestehender internationaler Studien (Frank et al., 2015; Tellis et al., 2009) verglichen und beträchtliche Übereinstimmung festgestellt. Zusätzlich wird der gewählte Klassifizierungsansatz durch den Umstand bekräftigt, dass ausgemachte EA eine größere Anzahl an digitalen Endgeräten nutzen. Dass die genannten Ausprägungen der Persönlichkeitsmerkmale auch zu Unterschieden in der Internetnutzung führen, kann im weiteren Verlauf der Auswertung bestätigt werden. So wird festgestellt, dass die Gruppe der EA das Internet häufiger für Informations- und Kommunikationszwecke, aber auch für spezifische Dienstleistungen wie Online-Banking und Online-Shopping nutzen. Darüber hinaus nutzen die EA das mobile Internet häufiger im Vergleich zur

Allgemeinheit. Insbesondere weibliche EA lassen sich in Deutschland über Kommunikationswebseiten im Internet erreichen.

Für die folgende Analyse des Forschungsbeitrags 2 ist die Nutzung des Internets als Informations- und Kommunikationstool von übergeordnetem Interesse. Aufgrund der bedeutenden Rolle dieser Anwendungsfelder für die Kaufentscheidung der Konsumenten stellt sich die Frage nach den unterschiedlichen negativen Einflüssen verschiedener Arten negativer Online-Kommunikation. Die Ergebnisse zeigen, dass funktionale Kritik die Verbrauchereinstellung deutlich stärker als ethische und destruktive emotionale Kritik beeinflusst. Die beiden letztgenannten Kritikarten bewirken überraschenderweise ähnlich große Veränderungen auf die Produkteinstellung. Weiterführend ist es für Unternehmen relevant zu wissen, inwieweit der Einstellungswandel durch den Einfluss einer nachträglich wahrgenommenen positiven Online-Kommunikation wieder in Richtung der anfänglich positiven Wahrnehmung angepasst werden kann. Die Ergebnisse verdeutlichen, dass nach der Exposition mit positiven Online-Bewertungen in allen Versuchsgruppen eine signifikante Verbesserung der Produkteinstellung eintritt.

Da es für die Evaluierung des Prozesses der Innovationsentscheidung wichtig ist, Aussagen über Innovationscharakteristika sowie das individuelle Entscheidungsverhalten eines potenziellen Konsumenten zu treffen, wird zur Ergründung der hemmenden Diffusion des MP auf die Analyse akzeptanzstiftender Faktoren zurückgegriffen. Damit MP Provider diverse Anspruchsgruppen ihren Bedürfnissen entsprechend erreichen können, wird in Forschungsbeitrag 3 der moderierende Einfluss generationsspezifischer Unterschiede auf die Wirkung relevanter Faktoren der Einstellung zur Nutzung gegenüber MP untersucht. Es lässt sich feststellen, dass die jüngere Generation der DN MP für nützlicher, bedienungsfreundlicher und sicherer hält. Zudem haben sie eine positivere Einstellung gegenüber MP als die ältere Gruppe der DI. Lediglich der negative Einfluss der wahrgenommenen Sicherheit hat einen signifikant stärkeren Einfluss auf die Einstellung von DI als auf DN. Mögliche Sicherheitsrisiken sind demnach, aus Sicht der älteren Verbraucher, mit größeren Konsequenzen verbunden.

Um ein noch tieferes Verständnis für die Adoption und den Diffusionsprozess des MP zu erlangen und die Systeme für eine möglichst große Anzahl an Verbrauchern zu optimieren, wird in Forschungsbeitrag 4 ein etablierter mit einem MP-Entwicklungsmarkt verglichen. Es lässt sich feststellen, dass die Beziehung des sozialen Einflusses

auf die Verhaltensabsicht zur MP-Nutzung durch Hofstedes Kulturdimension Individualismus vs. Kollektivismus moderiert wird. Die positive Wirkung des sozialen Einflusses auf die Nutzungsintention von MP ist demnach in dem Land mit einem geringeren Grad an Individualismus signifikant stärker. Deshalb ist der beschriebene Einfluss in Deutschland größer als in den USA. Des Weiteren lässt sich beobachten, dass sowohl in Deutschland als auch in den USA die Faktoren Vertrauen, erwartete Nützlichkeit sowie der soziale Einfluss als besonders relevante Einflussgrößen auf die Nutzungsabsicht angesehen werden können. Das Betrugsrisiko sowie die Einfachheit der Nutzung von MP wirken sich in beiden Ländern hingegen nicht prägend auf die Nutzungsabsicht aus.

Auf Basis des UTAUT wird im Forschungsbeitrag 5 das ST untersucht. Die angestellte Forschung soll Aufschluss darüber geben, welche Faktoren die Verhaltensabsicht zur Nutzung von ST-Plattformen vorhersagen und ob sich diese Faktoren zwischen handelserfahrenen und unerfahrenen potenziellen ST-Kunden unterscheiden. Die Ergebnisse zeigen signifikante Unterschiede zwischen den beiden Gruppen. Während die Performance bezogenen Faktoren die Vorhersage zur Nutzungsabsicht von ST für erfahrene Händler bestimmt, sagen die individuelle Risikoaversion, die Aufwandserwartung und die wahrgenommene Sicherheit vorrangig die Nutzungsabsicht der unerfahrenen Gruppe voraus. Die Beratungsempfänglichkeit beeinflusst die Nutzungsintention beider Gruppen in einem vergleichbaren Ausmaß.

1.5 Diskussion und Implikationen der vorgestellten Beiträge

Die übergeordnete Forschungsfrage beschäftigt sich mit der Diffusion, Adoption und Akzeptanz innovativer Technologien. Hierzu war es elementar, die Kundengruppe der EA näher zu untersuchen, da ihnen eine bedeutende Rolle innerhalb des Diffusionsprozesses von Innovationen zukommt. Damit Unternehmen das enorme Kommunikationspotenzial der EA für ihre Zwecke nutzen können, ist es entscheidend, diese zuerst identifizieren zu können (Frank et al., 2015). Dazu wurde, ausgehend von der Kritik an Rogers‘ (2003) zeitabhängiger Klassifizierung von EA, eine neuartige Methodik zur Kategorisierung technologischer EA geprüft. So wurden in einem ersten Schritt persönliche Merkmale berücksichtigt und danach die demographischen Daten kontrolliert. Die gewählten Persönlichkeitsausprägungen sind entscheidende Elemente des Diffusionsprozesses von technologischen Innovationen (Bass, 1969, 2004). Die auf

dieser Grundlage durchgeführte Selektion potentieller EA führt zu vergleichbaren demografischen Ausprägungen dieser Zielgruppe wie in internationalen Referenzuntersuchungen (Frank et al., 2015; Tellis et al. 2009).

Somit konnte zielgerichtet das Online-Nutzungsverhalten der technologischen EA mit dem der Mehrheit der deutschen Bevölkerung verglichen werden. Dies ist ein wichtiger Beitrag zur bestehenden Forschung, da Rogers (2003) Theorie der Diffusion von Innovationen keinen Aufschluss darüber bietet, wie sich das Nutzungsverhalten nach Etablierung einer Technologie zwischen den Nutzergruppen unterscheidet. Es kann resultiert werden, dass die gebildeten Gruppen sich signifikant im Nutzungsverhalten des Internets unterscheiden und das Internet besonders für die potentiellen EA neuer Technologien einen zusätzlichen Wert darstellt. Im Hinblick auf den Diffusionsprozess ist die Kommunikationstätigkeit der EA im Internet von besonderem Interesse. Sie nutzen das Internet regelmäßiger zu Kommunikationszwecken als die überwiegende Mehrheit. Die häufige Nutzung von sozialen Netzwerken und Messenger-Diensten untermauert die von Bass (1969) postulierte große Bedeutung der EA im Diffusionsprozess. Angesichts des wachsenden Einflusses der elektronischen Mund-zu-Mund-Kommunikation auf die Einstellung der Verbraucher und ihre Kaufentscheidungen gewinnt diese Erkenntnis an Bedeutung (u. a., Brown et al., 2007; Tang, 2017). So ist es für Anbieter innovativer Produkte oder Dienstleitungen unabdingbar, EA über das Internet anzusprechen, da sie dort zielgerichtet erreicht werden können. Es sollte deshalb ein angemessenes Budget für Online-Werbung bereitgestellt werden, um EA gezielt kontaktieren und von dessen auslösen viraler Effekte im Internet profitieren zu können.

Durch die Möglichkeiten der kommunikativen Teilhabe finden Informationen über Netzwerkeffekte im Internet schneller Verbreitung als offline (Aggarwal & Yu, 2012; Bohl, 2007). Die dadurch zu implizierende größere Reichweite der Informationsdiffusion verbessert die Möglichkeiten der Verbraucher, sich über Produkte zu informieren oder aber eigene konsumbezogene Ratschläge zu erteilen (Hennig-Thurau et al., 2004). Insbesondere die Relevanz negativer Online-Informationen wird in der Literatur hervorgehoben (Kumar & Purbey, 2018; Rozin & Royzman, 2001). Nachdem Erkenntnisse darüber erlangt werden konnten, wer das Internet verstärkt zur Informationsweitergabe nutzt, ist ein vertieftes Verständnis über die Auswirkung dieser Kom-

munikation auf die Produkteinstellung bedeutend. Die Ergebnisse der dazu durchgeführten Studie 2 belegen, dass negative Online-Beiträge hinsichtlich ihrer Auswirkungen auf die Produkteinstellung nicht verallgemeinert werden dürfen. Des Weiteren ist auch die Nachhaltigkeit der evozierten Einstellungsänderung fallweise zu betrachten. Indem herausgestellt wird, dass durch negativen eWOM nicht automatisch von einer allgemeinen Gefahr ausgegangen werden kann, trägt diese Studie einen erheblichen Beitrag zur anhaltenden Diskussion bezüglich des gefährlichen Charakters negativen eWOMs bei. Der vorgenommenen Differenzierung unterschiedlicher Inhaltstypen negativer Online-Kommunikation kommt eine übergeordnete Bedeutung zu. Einerseits, um den wissenschaftlichen Diskurs zur Einordnung negativer Information zu bereichern, und andererseits, um von negativen Kommentaren betroffenen Unternehmen eine Hilfestellung zu geben, ihre Ressourcenallokation nur auf die Bearbeitung bestimmter Kommentare zu fokussieren. Zusätzlich kann die Feststellung, dass die negativen Auswirkungen auf die Einstellung zu einem Produkt durch positive Information teilweise umgewandelt werden können, die Angst vor einer dauerhaften Schädigung des Rufs durch negative Online-Rezensionen beseitigen. Dem Umgang mit negativen ethischen Informationen kommt jedoch besonders in Zeiten eines stärker werdenden öffentlichen Diskurses zum Thema Nachhaltigkeit (Bansal & Clelland, 2004) ein übergeordneter Stellenwert zu. Ist ein Produkt ethischer Kritik ausgesetzt, so ist die daraus resultierende Negativität diesem gegenüber nicht so leicht wieder rückgängig zu machen. Diese Feststellung ist von zentraler Bedeutung, da besonders ethisches Verhalten zu einer höheren Kundenbindung führt (Lin et al., 2017). Unternehmen ist daher zu empfehlen, aktive Maßnahmen zu ergreifen, um ethische Vorwürfe zu vermeiden (Vanhamme & Grobben, 2009). Die Entwicklung und Umsetzung einer effektiven CSR-Strategie sowie eines Reputations- oder Risikomanagements sind Möglichkeiten, ethischer Kritik zu begegnen und die Unternehmensidentifikation der Konsumenten zu stärken (u. a., Du et al., 2010; Huang et al., 2017).

Zielgerichtete CSR-Kampagnen oder die bewusste Ansprache von EA können demnach Möglichkeiten für eine Einstellungsänderung und eine schnellere Diffusion innovativer Lösungen sein. Trotz dahingehender großer Bemühungen in der Vergangenheit, MP-Angebote im stationären Handel zu etablieren, verläuft die Adoption der Dienstleistung in Deutschland bisher äußerst schleppend. Eine Untersuchungsgrundlage für mögliche Ursachen dieser ausbleibenden Verbreitung wurde innerhalb dieser

Dissertationsschrift in der klassischen Akzeptanzforschung gesucht. Zu diesem Zweck ist auf Basis des TAM ein Generationen- sowie ein Kulturvergleich im Hinblick auf die Nutzungsakzeptanz von MP-Angeboten durchgeführt worden. Die Ergebnisse der Untersuchung belegen, dass sich die Einstellung zur Nutzung von MP zwischen den Generationen unterscheidet. Obgleich das wahrgenommene Risiko für beide untersuchten Generationen einen entscheidenden Faktor darstellt, betrachten ältere Konsumenten MP als risikoreich und werden daher in ihrer Einstellung stärker beeinflusst. Es ist für MP-Anbieter daher unumgänglich, die Systeme nicht nur mit hohen Sicherheitsstandards zu konzipieren, sondern die Sicherheit dieser Systeme, insbesondere gegenüber den älteren Konsumenten, generationsspezifisch zu kommunizieren. Wie bereits dargelegt, sind EA aufgrund ihrer definierenden Eigenschaften für den Diffusionsprozess von Innovationen von entscheidender Bedeutung (Rogers, 2003). Zu vergleichen mit den technologischen EA definiert sich auch die Generation der DN über eine hohe Technologieaffinität (Prensky, 2001) sowie über eine verstärkte Nutzung des Internets zur Kommunikationsabwicklung und Informationsbeschaffung (McCormack & Poole, 2009). Sollte es daher MP-Anbieter gelingen, die grundlegend höhere Akzeptanz der DN zu nutzen und in die tatsächliche Nutzung von MP umzuwandeln, könnte, durch virale Effekte der Online-Kommunikation, die Diffusion unter den älteren Konsumenten gefördert werden (Bass, 1969, 2004).

Bezüglich der kulturellen Unterschiede zwischen Deutschland und den USA kann festgestellt werden, dass die positive Wirkung des sozialen Einflusses auf die Verhaltensabsicht zur Nutzung von MP in dem Land mit einem geringeren Grad an Individualismus signifikant stärker ist. Da insbesondere in der deutschen Stichprobe der soziale Einfluss als ein wesentlicher Treiber der Verhaltensabsicht zur Nutzung mobiler Bezahlsysteme zu erkennen ist, kann durch die Ergebnisse des Forschungsbeitrags 4 die Relevanz der sozialen Beeinflussung hervorgehoben werden. Zusätzlich unterstreichen diese Erkenntnisse die Empfehlung, EA oder DN in den kommunikativ gesteuerten Diffusionsprozess einzubeziehen. Die hervorzuhebende Bedeutung des sozialen Einflusses lässt sich äquivalent auch beim ST feststellen. Die Beratungsempfänglichkeit, als Kriterium für den sozialen Einfluss, weist für die gesamte Stichprobe einen maßgeblichen Effekt auf die Verhaltensabsicht zur Nutzung von ST auf. Aus diesem Grund ist die Implementierung plattformeigener, personalisierter Empfehlungs- und

Kommunikationssysteme sowohl für erfahrene als auch unerfahrene Händler eine adäquate Maßnahme.

Insbesondere im Forschungsbeitrag 3 und 5 werden die sicherheitsrelevanten Faktoren im Umgang mit digitalen Finanzdienstleistungen als bedeutend herausgestellt. Somit ist es an den anbietenden Unternehmen, das Vertrauen in ihre Angebote zu erhöhen. Durch die ausdrückliche Einhaltung und Besicherung der Datenschutzrechtlinien (Xu et al., 2008) sowie die Implementierung geeigneter Cyber-Sicherheitssysteme, die von unabhängigen Institutionen zertifiziert werden (Liu et al., 2012), können Transparenz und Vertrauen in die Anwendung der Technologien hergestellt werden. Es zeigt sich also, dass Unternehmen in der Ansprache neuer Kunden den Fokus nicht mehr zwangsläufig auf die Betonung der Einfachheit der Nutzung der Systeme legen sollten, sondern der Aspekt der Sicherheit von Systemen hervorgehoben werden muss. Unter anderem durch die Abfrage der sicherheitsrelevanten Faktoren sind die verwendeten Akzeptanzmodelle der UTAUT sowie des TAM erweitert bzw. konkretisiert worden. Die vollzogenen Anpassungen haben sich über alle Forschungsbeiträge hinweg als zielführend erwiesen, da der Erklärungsgehalt des jeweiligen Forschungsmodells als äußert hoch zu verifizieren ist. Insbesondere durch die speziellen Charaktere des ST, das grundlegende Eigenschaften von Social-Media-Plattformen aufweist, können die Annahmen traditioneller Theorien verletzt werden (Kane et al., 2014). Der Forschungsbeitrag 5 liefert durch die erfolgreiche theoriegeleitete Integration der beschriebenen Variablen in die nomologische Struktur des ursprünglichen UTAUT-Modells einen wichtigen Beitrag und eine zielführende Grundlage für folgende Untersuchungen zum ST. Darüber hinaus kann dieses konzipierte Forschungsmodell als Ausgangspunkt für die Analyse weiterer Social-Media basierter Investitionsplattformen, wie beispielsweise dem Crowdfunding, verwendet werden.

Resümierend lässt sich festhalten, dass die vorliegende Dissertationsschrift einen wertvollen Beitrag für die Theoriebildung im Bereich der technologischen Finanzdienstleistungsinnovationen wie auch zur Identifizierung von EA liefert. Besonders die präzise Identifizierung und Analyse dieser Kundengruppe ermöglicht einen, über bisherige Theorien hinausgehenden, Einblick in die Nutzungsunterschiede einer bereits etablierten Technologie, verglichen mit der Mehrheit der Bevölkerung. Der wesentlichen Bedeutung der internetgestützten Kommunikation für die EA, aber auch für die

Verbreitung von Innovation, ist zusätzlich durch Erkenntnisse zu divergierenden Auswirkungen unterschiedlichen eWOMs Rechnung getragen worden. Auf dieser Grundlage ermöglichen die erzielten Ergebnisse der Akzeptanzforschungen das Ableiten präziser Empfehlungen zur zielgerichteten Steuerung kommunikativer Maßnahmen, die dazu beitragen, die Adoption von MP und ST zur fördern und den Diffusionsprozess zu beschleunigen. Dies gelingt durch eine umfangreiche Untersuchung der verschiedenen Elemente des Prozesses der Innovationsentscheidung. So erlaubt die angefertigte Dissertationsschrift, phasenübergreifende Aussagen zum individuellen Entscheidungsverhalten der Konsumenten in digitalen Medien zu treffen, ohne dabei die besondere Wirkung des Kommunikationsaspekts unberücksichtigt zu lassen. Folglich verbessern die gemachten Ausarbeitungen das Verständnis des Konsumentenverhaltens in digitalen Medien, welches insbesondere im heutigen dynamischen und komplexen Marktumfeld stetigen Veränderungen unterworfen ist.

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2 Research Paper 1: "How to Reach Technological Early Adopters? An Empirical Analysis of Early Adopters' Internet Usage Behavior in Germany"

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Abstract: Early adopters (EAs) represent a crucial group of consumers in the diffusion of innovations. Therefore, reaching potential technological EAs for up and coming innovations is of vital importance. However, little is known as to how potential EAs for new technologies use the Internet. Our study examines the Internet usage of EAs in comparison to the general public and gives an overview of 15 different channels. Consequently, we classified EAs and analyzed a vast set of data containing 119,829 subjects. The results demonstrate significant differences between EAs and the remaining population and offer marketers new insights into EAs' Internet usage behavior.

2.1 Introduction

Digitalization has led to an increasing number of technological innovations in the past few years, such as virtual reality, autonomous driving or mobile payment. Funding and generating revenues is difficult at the beginning, particularly for innovative start-ups, forcing many new companies to shut down operations prematurely. Hence, the diffusion of innovations has been an essential issue for researchers in the field of consumer behavior (e.g., Goldsmith & Witt, 2003; Hirschman, 1980; Lynn, Muzellec, Coemmerer, & Turley, 2017; Midgley & Dowling, 1978; Reinhardt & Gurtner, 2015; Rogers, 2003).

The first users adopting innovations play a decisive role in the process of dissemination as every new product carries uncertainty and therefore hampers its own diffusion. They are therefore not only the first users to create revenues, but also the ones who accelerate the process of diffusion through word-of-mouth communication (Arnould, Price, & Zinkhan, 2002; McDonald & Alpert, 2007; Tobbin & Adjei, 2012). Consequently, identifying these consumers and providing them with target-orientated advertising is an important challenge for innovative technology companies.

Rogers (2003) describes the first 2.5 percent of all users of a new technology as innovators, followed by early adopters (EAs), who make up the next 13.5 percent. A plethora of authors referred to the definition of Rogers (2003) (e.g., Laukkanen & Pasanen, 2008; Lynn et al., 2017; Moldovan, Steinhart, & Ofen, 2015; Reinhardt & Gurtner, 2015). Lynn et al. (2017), for example, applied his approach to classify the first users of Twitter and Google+ as EAs and investigated their social network site influence. However, this time-dependent and therefore one-dimensional aspect of Roger's definition has been doubted (e.g., Midgley & Dowling, 1978) and even been called 'a purely statistical artefact' (McDonald & Alpert, 2007). Instead, categorizing EAs based on their characteristics and personalities provides much more predictive ability and could offer new insights into what is behind the action of adoption (McDonald & Alpert, 2007). The reason why many researchers still examine EAs according to Roger's (2003) definition, is the difficulty of identifying this group within the general population. Consequently, authors only considered EAs of new domain-specific technologies, such as mobile banking (Laukkanen & Pasanen, 2008), mobile money (Tobbin & Adjei, 2012) or social network sites (Lynn et al., 2017) and investigated their usage behavior at the beginning of the diffusion process of new technologies.

These studies are based on the diffusion of innovation (DOI) by Rogers (2003), which focuses on the comparison of various groups of adopters. However, this theory stays quiet when it comes to differences in usage behavior once a broad audience starts using mentioned technologies. Consequently, no empirical evidence regarding the current usage of the Internet of potential EAs for upcoming innovations could be identified. Knowledge of their usage of established media is of particular importance, as those media channels serve as communication networks between companies and potential EAs, who are vital elements in the diffusion process of innovations. Therefore, identifying their usage patterns and reaching EAs through the Internet is a promising strategy. As the Internet is a widely used media in Germany and serves as a crucial marketing channel, the aim and motivation of our investigation is to compare the Internet usage of potential Innovators and EAs for new technologies with the majority of the population, allowing for user-specific marketing and communication.

To widen the scope of current research, we had to differ our study from previous investigations in several aspects. Firstly, we reflected on the criticism of McDonald and Alpert (2007) and identified potential technological EAs depending on their personal traits, which we derived from the literature, rather than a certain percentage of new users of a technology. Previous research indicates, that EAs' interests and behaviors differ depending on the specific domain or type of innovation (e.g., Bruner, Kumar, & Heppner, 2007; Goldsmith & Hofacker, 1991). Therefore, a specific classification of EAs for the context of this study is essential. As the aim of our research is to investigate the Internet usage behavior of technological EAs for up and coming high-tech gadget products, we identified three decisive personal traits regarding their leading role in the diffusion process of new technologies postulated by Bass (1969). Herein, we combined technological innovativeness (Bruner et al., 2007), independent decision-making (Midgley & Dowling, 1978) and opinion leadership (Goldsmith & Witt, 2003) to define a technological EAs in this study. Accordingly, a technological EA in this study is defined as a consumer, who shows a high potential to accelerate the diffusion of technological innovations, such as technological gadgets (Bruner & Kumar, 2007).

We categorized only those as technological EAs, who answered 'completely agree' as well as 'mostly agree' in all considered personal traits. We used a sample of 119,829 German citizens to categorize 8,329 EAs, which account for 6.95 % of the evaluated

subjects. Therefore, our evaluation identified those as EAs whom Rogers (2003) described as innovators as well as a small subgroup of opinion-leadership-oriented EAs, who show a high potential for the adoption of high-tech gadget products. As mentioned above, current literature about the media use of EAs focuses on domain-specific technologies. However, we aim to provide a general overview of the Internet channels used by technological EAs in comparison to the majority of the population in Germany. Furthermore, we focus on the communication channels, which serve as a decisive advertising platform as the influence of electronic word-of-mouth communication on consumer attitude and purchase decisions is growing (e.g., Brown, Broderick, & Lee, 2007; Tang, 2017). In this context, we analyzed gender specific variations among EAs more precisely, which can be used to give more target-oriented practical recommendations. Consequently, our study also offers a deeper understanding of group differences among EAs. Knowledge concerning the Internet usage of EAs is an essential condition for practitioners, as the Internet is one of the most influential media channels used by Germans and the most important for youngsters (Breunig, Hofsümmer, & Schröter, 2014). Marketers can apply the results to improve their relationship management and therefore try to reach a higher level of satisfaction for EAs.

The remainder of our study is organized as follows: We start by reviewing the current research in the field of EAs and their media usage. Based on this literature, we develop our hypotheses followed by an explanation of the research methodology and the presentation of our results. Finally, we discuss our research findings and create theoretical and practical implications.

2.2 Theoretical framework

2.2.1 Relevant work

The theory of EAs and innovations has long been an essential topic within academic research since Rogers' pioneering work in 1962. According to Rogers and Shoemaker (1971), innovativeness is defined as 'the degree to which an individual is relatively earlier in adopting an innovation than other members of his system.' Herein, Rogers (2003) classified five different adopter categories based on his time-dependent concept of innovativeness: (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards. He applied the mean time of adoption and the standard deviation

to distinguish between the adopter groups (Rogers, 2003). Consequently, innovators adopt a new technology two standard deviations before the mean time of the entire sample (McDonald & Alpert, 2007). Although innovators and early adopters can be seen as different groups, many authors do not distinguish between those two (e.g., Laukkanen & Pasanen, 2008; Lynn et al., 2017; Moldovan et al., 2015; Reinhardt & Gurtner, 2015). As there is no commonly accepted threshold, we combine innovators and early adopters when using the term EAs.

Bass (1969) referred to the concept of Rogers (1962) from a mathematical perspective and developed 'The Bass Model' (Bass, 2004). He postulated that innovators 'decide to adopt an innovation independently of the decision of other individuals in a social system' (Bass, 1969). Other adopters, whom he called 'imitators', succumb to social pressure and the influence of word-of-mouth regarding new technologies (Bass, 1969). Therefore, his characterization is more trait-specific than the one-dimensional definition of Rogers and Shoemaker (1971) as it includes the communication aspect. Midgley and Dowling (1978) differentiated between innate and actualized innovativeness, describing the first as 'the degree to which an individual is receptive to new ideas and makes innovation decisions independently of communicated experience of others.' Consequently, it is advisable to classify EAs by considering their technological affiliation as well as their capability to decide independently. Hirschman (1980) suggested another concept of innovation: 'novelty seeking.' He distinguished between inherent novelty seeking, which he described as 'the desire of the individual to seek out novel stimuli' and actualized novelty seeking, which refers to one's actual usage behavior (Hirschman, 1980). McDonald and Alpert (2007) criticized his conceptualization because it 'does not seem to offer any new, practical direction' and has not been regarded by many researchers.

A more important personal trait than the novelty-seeking behavior of EAs is their role of being 'opinion leaders', as the communication through electronic word-of-mouth is essential to the acceleration of diffusion processes (Bass, 1969; Rogers, 2003). Goldsmith and De Witt (2003) defined opinion leadership as the degree of influence a person has on others as a result of superior knowledge. Studies regarding opinion leadership have led to inconsistent results (McDonald & Alpert, 2007) but succeeding studies did confirm a relationship between innovativeness and opinion leadership (e.g.,

Ruvio & Shoham, 2007; Thakur, Angriawan, & Summey, 2016). Numerous researchers have examined the effect of innovativeness on the use of Internet services, such as electronic banking (e.g., Lassar, Manolis, & Lassar, 2005; Laukkanen & Pasanen, 2008), Internet shopping (e.g., Citrin, Sprott, Silverman, & Stem, 2000; Lee, Temel, & Uzkurt, 2016) or communication channels, for example social network sites (e.g., Lynn et al., 2017; Pagani, Hofacker, & Goldsmith, 2011).

Laukkanen and Pasanen (2008) referred to Rogers' time-based selection when comparing the personal characteristics of 'non-mobile banking adopters' with 'mobile banking adopters', the latter which they categorized as EAs. They concluded that gender and age differ significantly between these two groups as EAs were predominantly male and younger by comparison. This relationship was confirmed in a general innovativeness context by Tellis, Yin and Bell (2009). In regard to the use of Internet shopping, Citrin et al. (2000) and Lee et al. (2016) confirmed a positive relationship between domain-specific innovativeness and the adoption of Internet shopping. With the increasing importance of electronic word-of-mouth communication (Tang, 2017) the use of communication sites is of particular interest. Pagani et al. (2011) showed a positive impact of innovativeness on the active use of social network sites. Lynn et al. (2017) followed Rogers (2003) by classifying EAs as the first 2,000 users of Twitter and the Google+ service. The authors examined the three characteristics 'extraversion', 'openness' and 'conscientiousness on information and rumor sharing'. Significant effects of all three personal traits on information sharing were illustrated, although openness did not show a significant impact on rumor sharing (Lynn et al., 2017).

In a related study regarding Internet usage, Park and Yoon (2005) developed a framework for the diffusion of the Internet for the Korean market. They concluded that market factors, the government, the technology as well as cultural and social factors played a vital role for a successful diffusion. As our study focuses on EAs, particularly social and cultural factors are of interest. Herein, Park and Yoon (2005) recommend different strategies to initiate the diffusion process for EAs as well as for the majority. Therefore, it is necessary to identify potential EAs for the respective technology as early as possible.

Although there are indications that EAs from different countries and with different areas of interest share some demographic and personal similarities (Tellis et al., 2009), researchers investigating the diffusion of innovations need to specify the type of EAs

they refer to, for instance EAs in the domain of agriculture (e.g., Cavallo, Ferrari, Bollani, & Coccia, 2014), EAs of social network sites (e.g., Lynn et al., 2017) or EAs for electric vehicles (Namdeo, Tiwary, & Dziurla, 2014). Additionally, innovative behavior is moderated by cultural and economic factors (e.g., Frank, Enkawa, Schvaneveldt, & Herbas Torrico, 2015; Yaveroglu & Donthu, 2002) and can therefore differ across countries.

In this study, we investigate the Internet usage behavior of technological EAs for potential high-tech products and services in Germany. We classify this vital consumer groups by combining their level of technological innovativeness (Bruner et al., 2007), independent decision-making (Midgley & Dowling, 1978) and opinion leadership (Goldsmith & Witt, 2003), as the combination of these three personal traits is supported by the results of previous investigations, such as the study of Bruner and Kumar (2007).

To summarize, researchers focused on the influence of one's innovativeness on other personal traits as well as the adoption of novel Internet services. Studies compared EAs' usage behavior of innovative technologies with various user groups in the early stages of adoption. However, no studies comparing the usage of established media like the Internet between potential EAs for future technologies and the remaining public could be identified. The fact that the communication process is a two-step flow was already taken into account by Katz and Lazarsfeld in 1955. In a first step, information stemming from the media reaches opinion leaders, who in a second step pass them on other people (Katz & Lazarsfeld, 1955). Therefore, an investigation of the Internet usage behavior of EAs as opinion leaders is essential, as these consumers are essential as communicators in the diffusion of innovations. To fill these research gaps, this paper offers an overview of the services and sources EAs revert to on the Internet and compares their usage to the majority of the population. Furthermore, we investigate scarcely considered gender differences regarding Internet specific communication activity of EAs. The corresponding hypotheses to address these research gaps draw upon relevant literature and are proposed in the following part.

2.2.2 Hypotheses development

The Internet serves as a valuable and convenient service tool to gather information, communicate and provides access to innovative services. Compared to traditional media, such as radio, television or newspapers, it offers several advantages. It is characterized by freedom from censorship, speed, low contribution costs, global reach and interactivity (Duncan, 2000). Therefore, it can provide users with limitless up-to-date information (Chan & Leung, 2005). Johnson and Kaye (2000) showed that the Internet is used for specific in-depth information research. Referring to the personality traits of EAs, Hirschman (1980) proposed his concept of inherent novelty seeking. According to his study, EAs actively seek novel stimuli, particularly for 'potentially discrepant information' (Hirschman, 1980). The Internet enables EAs to satisfy their domain-specific needs for new information by using search engines and online news pages. By doing so, companies are able to analyze their data, Internet patterns and interests to supply them with appropriate personalized information (Tucker, 2014). This information is connected to their technological interests (Lambrecht & Tucker, 2013) and therefore seems more appealing to them (Anand & Shachar, 2009). Besides the simple access to information, websites, such as online newspapers, allow for more 'interactivity' among their readers (Chung, 2008). Although Chung (2008) showed that online audiences are not using interactive features to a great extent, these features might be particularly interesting for EAs, as they are likely to appreciate gadgets (Bruner & Kumar, 2007; Thakur et al., 2016). Regarding the advantages of online information sites and EAs' higher degree of novelty seeking compared to the general population (Hirschman, 1980), we assume hypothesis 1:

H1: Early adopters use the Internet more frequently for information purposes than most people.

EAs are more likely to exert influence on others depending on their technological interests (Lynn et al., 2017). Therefore, they accelerate the dissimilation of information regarding new technologies among friends and acquaintances. The reason is that EAs show a higher degree of extraversion, openness and conscientiousness. These personal traits are significant predictors of information sharing in social network sites (Lynn et al., 2017). Pagani et al. (2011) could demonstrate that the vicarious innovativeness of EAs of social network sites does not only impact the active use of social network sites, but also their passive use. Consequently, EAs are more likely to post comments and

share information, as well as browse social content created by others (Lynn et al., 2017; Pagani et al., 2011). Additionally, Ruvio and Shoham (2007) and Thakur et al. (2016) demonstrated a correlation between innovativeness and opinion leadership. It is probable that technological opinion leaders will use social platforms to share their product experience as they tend to share information with others in their domain of interest (Goldsmith & Witt, 2003; Ruvio & Shoham, 2007; Shoham & Ruvio, 2008). In the communication context, Moldovan et al. (2015) postulated another relevant approach. The authors suggested that EAs with a high need of uniqueness are anxious of losing their exclusive position by communicating their experiences regarding new technologies too openly. However, they solve this dilemma by sharing information regarding technical aspects and the complexity of the innovative product to scare others who do not show a high level of technological affinity (Moldovan et al., 2015). With the emergence of Web 2.0, applications such as chats and messengers, social network sites and blogs started to play a decisive role in the process of communication (Katona, Zubcsek, & Sarvary, 2011). As the Internet facilitates a larger variety of communication processes compared to other media (Dimmick, Chen, & Li, 2004), it has become a preferred channel of information exchange. Against the background of EAs being opinion leaders and showing a strong need to communicate their knowledge and experience with others, as well as the predominant role of the Internet as a communication channel, we assume hypothesis 2:

H2: Early adopters use the Internet more frequently as a communication tool compared to most people.

In addition to information and communication, the Internet also provides a variety of other innovative services to facilitate processes. In our case, these include online banking, online shopping, video streaming and online gaming. Lassar et al. (2005) confirmed their assumption that domain-specific and actualized consumer innovativeness had a significant positive effect on the adoption of online banking. Since EAs show a higher level of innovativeness, they are more likely to take risks (Aldás-Manzano, Lassala-Navarré, Ruiz-Mafé, & Sanz-Blas, 2009), which is one of the key barriers in the adoption of online banking (Lee, 2008). Regarding the adoption of online shopping, similar aspects are important. Citrin et al. (2000) acknowledged a significant influence of domain-specific innovativeness on the adoption of Internet shopping. The authors confirmed that domain-specific innovativeness moderates the

relationship between Internet usage and online shopping. Lee et al. (2016) reconfirmed this effect. Furthermore, their results showed a significant impact of opinion leadership on online shopping (Lee et al., 2016). Concerning the adoption of online games, Liang (2012) examined the effect of personal traits on satisfaction and repurchase intention. Neuroticism, openness, extraversion and conscientiousness significantly affected both dependent variables (Liang, 2012). As EAs show a higher level of extraversion, openness and conscientiousness (Lynn et al., 2017), we assume that they are more likely to play online games than the majority of people. Considering all these indications, we postulate hypothesis 3:

H3: Early adopters use the Internet more frequently for specific services than most people.

Since its introduction in 1991 (Muylle, Moenaert, & Despontin, 1999), the Internet has reached a high level of adoption of nearly 80 percent in Germany (Statista, 2017). Around 70 percent of the population use mobile Internet on their digital devices (Sausen, 2016). A general affinity towards digital technology and also basic digital and technological skills are necessary to make full use of the Internet (van Dijk & Hacker, 2003). EAs show a higher level of these relevant skills, as they are more likely to try new products or services (Tellis et al., 2009). Furthermore, innovativeness is correlated with a higher degree of novelty seeking (Hirschman, 1980) and opinion leadership (Ruvio & Shoham, 2007; Thakur et al., 2016). Particularly EAs are eager to spread news about innovations by word-of-mouth and thus share product evaluations to exercise their leadership position (Moldovan et al., 2015; Rogers, 2003). Thereby, mobile Internet access supports an even better integration into social life (e.g., Chircu & Mahajan, 2009; Napoli & Obar, 2014). Additionally, the higher need of mobility was confirmed as being positively related to consumer innovativeness (Tellis et al., 2009) and, therefore, to EAs. As an affirmation, Lu et al. (2005) showed the impact of personal innovativeness on the intention to adopt Internet services via mobile technology. As EAs show all named personal traits and tend to use mobile technology, we assume hypothesis 4:

H4: Early adopters show a higher adoption rate of the mobile Internet compared to most people.

Besides innovativeness, gender is an important variable influencing the Internet usage

behavior (e.g., Bimber, 2000; Peter & Valkenburg, 2006; Thayer & Ray, 2006). Hargittai (2007) investigated the impact of gender, age, race and ethnicity as well as parental education on the aggregate use of social network sites. The author detected gender to be the only demographic variable that appeared significant with women being more likely to communicate in social networks than their male counterparts. Besides the usage of social network sites, research of Joiner et al. (2012) showed women using e-mails, online telephone services and newsgroups more frequently than men. Kimbrough et al. (2013) confirmed these results and additionally found a higher usage behavior of text messaging and social media among women. The personality traits extraversion and neuroticism also vary across gender (Schmitt, Realo, Voracek, & Allik, 2008; Weisberg, Deyoung, & Hirsh, 2011). Schmitt et al. (2008) illustrated that women in most nations reported a higher level of extraversion and conscientiousness in their analysis across 55 cultures. Their results were confirmed by Weisberg et al. (2011), who found a significant impact of gender on these two personality traits. As these personal characteristics also influence the use of social networks (Lynn et al., 2017), women were found to communicate on the Internet more frequently than their male counterparts (e.g., Hargittai, 2007; Joiner et al., 2012; Kimbrough et al., 2013). Building on former research, we assume hypothesis 5:

H5: Female early adopters use the Internet more frequently as a communication tool compared to male early adopters.

2.3 Methodology

2.3.1 Data

We used data of a renowned German opinion research institution to examine the Internet usage of EAs in comparison to the majority of the population. Thus, an enormous sample of 119,829 German citizens could be examined. The demographic structure with the associated coding is listed in table 1. The codes are important for a later interpretation of the results. The sample reflected the actual German distribution regarding gender, age, education, income as well as the regional structure.

Table 1. Summary of demographic data of the sample.

Variable	Coding	Characteristic	Total number	Percentage
Gender	1	Male	57,563	48.0
	2	Female	62,266	52.0
Age	1	10 - 13 Years – not included	5,578	4.7
	2	14 - 17 Years	5,985	5.0
	3	18 - 19 Years	4,864	4.1
	4	20 - 24 Years	9,981	8.3
	5	25 - 29 Years	11,239	9.4
	6	30 - 34 Years	9,700	8.1
	7	35 - 39 Years	9,534	8.0
	8	40 - 44 Years	8,885	7.4
	9	45 - 49 Years	12,049	10.1
	10	50 - 54 Years	10,097	8.4
	11	55 - 59 Years	8,215	6.9
	12	60 - 64 Years	7,134	6.0
	13	65 - 69 Years	4,766	4.0
	14	70 Years and older	11,802	9.8

Table 1. (Continued) Summary of demographic data of the sample.

Education	1	No general graduation	8.514	7.1
	2	Main school, no response	27.033	22.6
	3	Secondary school	41.144	34.3
	4	A level degree	27.496	22.9
	5	University degree	15.642	13.1
Income (monthly)	0	No own income	13.402	11.2
	1	under Euro 500	15.489	12.9
	2	Euro 500 to 1.000	17.262	14.4
	3	Euro 1.000 to 1.500	20.242	16.9
	4	Euro 1.500 to 2.000	18.327	15.3
	5	Euro 2.000 to 2.500	12.677	10.6
	6	Euro 2.500 to 3.000	8.410	7.0
	7	Euro 3.000 to 3.500	4.610	3.8
	8	Euro 3.500 to 4.000	2.756	2.3
	9	Euro 4.000 to 4.500	1.439	1.2
	10	Euro 4.500 to 5.000	972	0.8
	11	Euro 5.000 to 7.000	1.786	1.5
	12	Euro 7.000 and more	2.457	2.1
Usage of mobile Internet	1	Use via Smartphone during the last three months	73.337	61.2
	2	No use via Smartphone during the last three months	40.914	34.1
	99	Not compiled among children	5.578	4.7

The Internet usage was measured among the following 15 Internet channels, which we clustered into categories. We classified ‘worldwide news’, ‘regional news’, ‘search engines’, ‘sport news’, ‘tv programs’ and ‘weather’ for the Internet usage as an information tool. The communication aspect of the Internet usage was categorized by ‘chats and forums’, ‘weblogs’, ‘chats and messengers’, ‘private email’ and ‘social networks’. We chose ‘online banking’, ‘online shopping’, ‘videos and movies’ and ‘online games’ for specific Internet services. Our categorization is related to the examination of Blank and Groselj (2014), who categorized different types of Internet usage. The different channels of Internet usage were measured on a three-point Likert scale from 1 ‘frequently’ to 3 ‘rarely’. Participants were asked if they used the Internet on their smartphone during the last three months for the measure of the adoption of mobile Internet.

We had to exclude 5,578 10- to 13-year-old children from our original sample of 119,829 because they had not been asked about their Internet usage. We also excluded anybody who had not been using stationary or mobile Internet during the last three months. Finally, we were able analyze a total number of 102,528 participants. The survey also contained the possibility of answering 'not specified'. However, we only analyzed data sets with no missing values. Consequently, one can see different sample sizes in the result section.

2.3.2 Selection of early adopters

As mentioned above, EAs differ depending on the type of innovation. Therefore, it is crucial to define the type of EA this study refers to. In correspondence to the criticism of Rogers' time-dependent concept by McDonald and Alpert (2007), we chose to consider personal traits when identifying EAs. Important characteristics of technological EAs for the diffusion process are their high level of technological innovativeness (Bruner et al., 2007), their ability to decide independently of the communicated experience of others (Midgley & Dowling, 1978) and their opinion leadership (Goldsmith & Witt, 2003). As the classification of EAs in former studies considered either their level of innovativeness (e.g., Reinhardt & Gurtner, 2015) or the moment of adopting a certain technology (e.g., Lynn et al., 2017), our approach was to combine three distinct characteristics to select a technological EA, as it is supported by previous studies (e.g., Bruner & Kumar, 2007). Therefore, we refer to EAs of new technological products, services and high-tech gadgets, such as mobile payment, virtual reality applications or novel types of smart technology. These constructs were evaluated by using single-item scales and self-evaluation. Rossiter (2002) as well as Bergkvist and Rossiter (2007) recommend using single-item scales to prevent biased answers through an excessive questionnaire length.

The first item measured the construct of technological innovativeness, which was postulated by Bruner et al. (2007). Participants were asked whether they were one of the first among his/her acquaintances to use newest technologies. A second decisive personal trait of EAs is their ability to decide independently (Midgley & Dowling, 1978). To test this construct, subjects were asked if they see themselves as an individualist. The communication behavior of EAs was identified by asking whether the person was an opinion leader during discussions (Goldsmith & Witt, 2003). Consequently, we

only categorized those as technological EAs who answered ‘completely agree’ or ‘mostly agree’ to all three constructs. As a result, 8,113 EAs were classified from the sample of 102,258 participants. To confirm this classification, we compared 94,415 people of the majority of the population (MP) to the 8,113 EAs via demographic variables such as age, gender, education and income.

2.4 Results

To empirically confirm our selection approach, a nonparametric Mann-Whitney U test was applied due to the ordinal measurement level of our scales. A frequency analysis of the medians showed that EAs were comparatively younger (Mdn_{age_EA} = 6.00; Mdn_{age_MP} = 8.00), male (Mdn_{gender_EA} = 1.00; Mdn_{gender_MP} = 2.00), higher educated (Mdn_{edu_EA} = 4.00; Mdn_{edu_MP} = 3.00) and had a higher income than most people (Mdn_{inc_EA} = 4.00; Mdn_{inc_MP} = 3.00). Therefore, the median age of EA was in the range 30 to 34, whereas the median age of the majority was in the range 40 to 44. According to the median, there was a higher percentage of men in the group of EAs compared to the group of most people. EAs were also higher educated, as their median reflects “A level degree” and the median of the majority reflects ‘secondary school’. Regarding the financial aspect of the compared groups, EAs show a monthly income of 1500 to 2000 Euro while the majority shows an income of 1000 to 1500 Euro. An applied Mann-Whitney U test confirmed significant results concerning age (U = 321092967.0, N_{EA} = 8.113, N_{MP} = 94415, $p < .001$, two-tailed), gender (U = 306464521.0, N_{EA} = 8.113, N_{MP} = 94415, $p < .001$, two-tailed), education (U = 334680075.5, N_{EA} = 8.113, N_{MP} = 94415, $p < .001$, two-tailed) and income (U = 367423919.5, N_{EA} = 8.113, N_{MP} = 94415, $p < .001$, two-tailed). Our results fully agree with the international study of Tellis et al. (2009) across 15 countries and 13 languages. These authors detected a significant relationship between innovativeness and the demographic variables: gender, age, education and income. According to their research, one can identify a global innovator as a young, highly educated and wealthy male compared to a non-innovator (Tellis et al., 2009).

Additionally, we confirm our categorization by using the ‘cross sectional’ method – a comparison between EAs and the majority of the population of their owned technical equipment in a particular category (Benoy & Shailesh, 1984). Midgley and Dowling (1978) recommend to use the cross-sectional technique to gain a more meaningful

construct of innovativeness. Regarding the digital devices, the surveyees gave information about ‘laptops/notebooks/netbooks’, ‘flat-screen TV’, ‘game consoles’, ‘smartphones’ and ‘tablets’ they own in their households. We calculated the mean of the digital devices mentioned and compared the two groups, whereby a value of 1 means that they own 100 percent of selected devices in their households. Upon comparison of our two groups, we identified EAs owning 74.82 percent (M_{tech_EA} = .75, SD = .21; N = 8,113) against 67.37 percent of the general public (M_{tech_MP} = .67, SD = .21, N = 94,415). The applied Welch test appears statistically significant (Welch t = 30.528, df = 9,431.09, p < .001) and therefore supports our classification.

To confirm our hypotheses, we also applied a Welch test to compare the group of EAs to the majority of the population. We followed the recommendation of Rasch et al. (2011) of applying the Welch test (Welch, 1938) without pretesting the assumptions of the independent t-test. This procedure is also supported by Ruxton (2006) because it offers more control about type I errors than the flexible approach of switching between the Student’s t-test and the Welch test according to the equality or inequality of variances. Additionally, a normal distribution is assumed as the data contained more than 30 people (e.g., Field, 2015; Tavakoli, 2013). Regarding missing values, we could compare 8,081 EAs to 93,412 people representing the majority of the population concerning the Internet usage as an information tool. For the Internet communication, we drew a comparison between 8,073 EAs and 92,740 non-EAs. For the Welch test of the specific services, 8,052 EAs and 91,647 citizens representing the general public were compared. There were no critical outliners in the data set.

We noticed that EAs use the Internet more frequently as an information source (M_{info_EA} = 1.78, SD = .42) compared to most people (M_{info_MP} = 1.83, SD = .45). The Welch test showed that the difference between the two groups was statistically significant (Welch t = -10.575, df = 9,770.15, p < .001), supporting H1. Additionally, EAs used the Internet more often for communication purposes (M_{comm_EA} = 1.66, SD = .46) than the majority of the population (M_{comm_MP} = 1.71, SD = .52). This difference showed statistical significance (Welch t = -10.273, df = 9,950.34, p < .001). We could also confirm (Welch t = -16.640, df = 9,807.97, p < .001) that the usage of specific services on the Internet among EAs (M_{serv_EA} = 1.75, SD = .49) was more frequent than among the general public (M_{serv_MP} = 1.85, SD = .54). Thus, all three hypotheses H1, H2 and H3 concerning the different Internet channels could be confirmed.

Regarding the mobile usage of the Internet (mI), we identified 87 percent of EAs (M_{mI_EA} = .87, SD = .34, N = 8,113) using the Internet on their smartphone during the last three months compared to 70 percent of the majority of the population (M_{mI_MP} = .70, SD = .46, N = 94,415). The Welch test applied showed statistical significance (Welch t = 40.507, df = 10,807.18, p < .001), confirming H4 (Table 2).

Upon further examination of EAs, we analyzed gender differences concerning their Internet-based communication behavior. We found significant differences between female and male EAs concerning the frequencies of using the Internet for communication purposes ($M_{comm\_femaleEA}$ = 1.60, SD = .436, N = 2,559; M_{comm_maleEA} = 1.68, SD = .46, N = 5,514). Thereby, women use the Internet more often for communicating (Welch t = 7.73, df = 5,276.46, p < .001).

Table 2. Summary of the results.

Hypothesis	Internet Usage	Consumer Group	Mean	Welch T	df
H1	Internet as an information source	Early adopter majority	1.79 1.83	-10.58***	9,770.15
H2	Internet as a communication tool	Early adopter majority	1.66 1.71	-10.27***	9,950.34
H3	Usage of specific Internet service offers	Early adopter majority	1.75 1.85	-16.64***	9,807.96
H4	Mobile Internet usage	Early adopter majority	.87 .70	40.51***	10,807.18
H5	Gender differences communication	Female Early Adopter Male Early Adopter	1.60 1.68	7.73***	5,279.09

Note: * p < .05 ** p < .01 *** p < .001.

To conclude, all our hypotheses H1 to H5 could be confirmed. The results show that EAs use the Internet more frequently than the majority of the population regarding information, communication and specific services. Additionally, they show a higher adoption of mobile Internet compared to the rest of the German population. Concerning the communication channels, particularly female EAs show the highest usage behavior among all investigated groups.

2.5 Discussion

As EAs play a decisive role in the diffusion of innovations (Rogers, 2003), a better understanding regarding their current usage of established media is of high theoretical

relevance. Research indicates, that these consumers differ from the general public concerning personal traits, such as innovativeness (e.g., Bruner & Kumar, 2007; Im, Bayus, & Mason, 2003), opinion leadership (e.g., Goldsmith & Witt, 2003) and their demographics (e.g., Tellis et al., 2009). Therefore, a classification according to these traits was the first step of this study. In correspondence with former literature (Bruner & Kumar, 2007), our approach was to combine the level of technological innovativeness (Bruner et al., 2007), independent decision-making (Midgley & Dowling, 1978) and opinion leadership (Goldsmith & Witt, 2003) to profile a technological EA, as these elements accelerate the process of diffusion of technological innovations (Bass, 1969, 2004). Herein, this study additionally endeavors to provide a sufficient answer on the criticism of Rogers' (2003) time-dependent classification of EAs. To verify our selection approach, we compared the demographic characteristics of the selected potential EAs with the outcomes of previous literature and reached similar results to the international studies of Tellis et al. (2009) and Frank, Enkawa, Schvaneveldt, and Herbas Torrico (2015). Secondly, we used the cross-sectional technique and compared the ownership of digital devices between the selected technological EAs and the majority. The results indicated that EAs own a greater variety of digital devices and strengthened our classification approach.

Previous research has often selected potential EAs by using demographic data instead of referring to their personality traits (e.g., Frank et al., 2015; Namdeo et al., 2014). Although this approach seems to be reasonable, EAs of new technologies represent only a small subgroup within the group, which is classified by demographic characteristics such as income, education, age or gender, as these demographic variables predict innovativeness (Tellis et al., 2009). Therefore, this study offers a novel methodology concerning the classification and clusters technological EAs by considering their personal traits in a first step and controlling their demographic data afterwards.

The second goal of our study was to confirm that the chosen personality differences of technological EAs affect their Internet usage behavior. The established theory of the diffusion of innovations (Rogers, 2003) does not offer insights into the subsequent usage differences between technological EAs and the majority of the population, once a broad audience has started to use a technology, such as the Internet. Therefore, we compared the Internet usage behavior of potential EAs for new technologies against

the usage behavior of the majority of the population. While previous academic research focused on EAs of domain-specific technologies or products, our study widens the scope of research by providing a general overview about the usage of 15 different Internet channels and therefore illustrates several ways in which this crucial consumer group can be reached on the Internet.

To analyze the Internet usage behavior, we made use of a vast sample of 119,829 participants, which fully reflects the entirety of the German population. The results of the applied Welch tests confirmed our assumptions and illustrated that EAs use the Internet more frequently for information and communication purposes, but also for specific services, such as online banking and online shopping. Additionally, EAs show a higher adoption of mobile Internet compared to the general public. Particularly female EAs can be reached through communication websites on the Internet in Germany.

We showed that personal traits affect the usage of the Internet and that the usage behavior of the Internet differs significantly between technological EAs and the majority of the population in Germany. Consequently, the Internet offers an additional value for potential EAs of new technologies (Rogers, 2003). Compared to other media, the Internet is of particular value as it can be used for specific in-depth information research (Johnson & Kaye, 2000). Other possible reasons for the high usage-frequency might be interactive features (Chung, 2008), which could be particularly interesting for the gadget loving EAs (Thakur et al., 2016). Another aspect may be personalized applications and proposals. Moldovan et al. (2015) emphasized the high need on uniqueness of EAs. According to Clark and Goldsmith (Clark & Goldsmith, 2006), EAs ‘may be less responsive to certain types of advertising, such as testimonials, celebrity endorsement, or expert opinions’, which are often part of the traditional media. Therefore, personalized offers through the Internet seem to be an efficient way to gain the attention of technological EAs and should be used by marketers to draw attention to their products and services.

In addition to these theoretical implications, the current study provides important practical implications for marketers. One of the key challenges for managers and new companies is to identify potential EAs for new products and services (Frank et al., 2015). Therefore, this study illustrates ways how to identify potential EAs for new technologies by regarding their Internet usage behavior. Herein, the Internet serves as not only a means of identifying but also of reaching EAs. The fact that EAs can be reached

more frequently on the Internet should be taken into consideration by marketing managers. Consequently, an appropriate budget for online advertising should be of the highest priority. Additionally, the high activity among several Internet channels should be considered when analyzing user profiles to detect and reach EAs.

With regard to the diffusion process, the communication activity of EAs is of particular interest. They use the Internet for communication purposes more regularly than others. This frequent usage of social network sites and messengers illustrates the high importance of EAs in the diffusion process postulated by Bass (1969). This gains in importance considering the growing influence of electronic word-of-mouth communication on consumer attitude and purchasing decisions (e.g., Brown et al., 2007; Tang, 2017). Burt (1999) identified opinion leaders and therefore our selected group of EAs to be vital elements in the diffusion of information, as these individuals spread news within and between their social clusters and are consequently able to extend the range of the information's distribution. Within the Internet, opinion leaders spread information through earned social media (Stephen & Galak, 2012), which, contrary to owned or paid social media, is perceived as trustworthy and helpful among followers (Vries, Gensler, & Leeflang, 2017). As opinion leaders exert influence on other consumers (e.g., Gilly, Graham, Wolfinbarger, & Yale, 1998; Sun, Youn, Wu, & Kuntaraporn, 2006) and are viewed as experts due to their product involvement (Jacoby & Hoyer, 1981), a product recommendation by electronic word of mouth can significantly accelerate the diffusion process and therefore increase revenues.

Regarding the role of gender among the group of technological EAs in Germany, particularly the influence of female EAs is noteworthy. We were able to show, that they use communication channels more frequently than their male counterparts and indicate the highest need of communication among all examined consumer groups. Consequently, channels such as social network sites should be used to target them, for example with fashion innovations (Beaudoin, Lachance, & Robitaille, 2003).

Another implication can be given considering the approach of the 'Stage-Gate' framework proposed by Cooper (2001). According to Cooper (2001), the development process of a new product from idea to launch is characterized as a series of five stages and five gates. Herein, each stage is designed to reduce uncertainties and risks by gathering useful information (Cooper, 2008), for instance regarding the consumers' needs. As

technological innovations aim to satisfy needs of the consumers (Coccia, 2017), understanding those of technological EAs and considering their crucial role in the 'Stage-Gate' systems is of vital importance. The stages of scoping, development and testing of new technological innovations (Cooper, 2008) offer opportunities to integrate technological EAs and therefore reduce the risk of failure. Particularly for high-tech products, technological EAs can be integrated through 'user toolkits' (Hippel, 2001), as these will satisfy their need for communication as well as assist firms in understanding EAs' needs. The results of our study indicate that EAs can be reached predominantly by using information and communication channels in the Internet and therefore show ways to integrate them into the process of innovation development. Additionally, they use the newest services, such as online payment or online shopping. An integration of their opinion and skills will not only enhance the product's technological performance, but also act as an early marketing instrument, thereby increasing the likelihood of a successful market penetration.

Although our study provides essential insights and deepens the understanding of customers' behavior, we had to face some limitations, which offer opportunities for further research. Due to the enormous sample size, all formulated hypotheses show significant results, despite low respective effect sizes. Additionally, the questionnaire could have been enhanced via several objective questions. Instead of applying a scale from frequently to rarely, a more precise specification of the time one visits the different types of websites would be advisable. This would enable a more detailed analysis of EAs' Internet usage behavior. Moreover, we were not able to consider cultural differences as the sample only consists of German surveyees. As cultural and economic factors moderate the relationship between antecedents of innovative behavior and the consumers' actual behavior (Frank et al., 2015), an international investigation of technological EAs' Internet usage behavior could be a promising approach. Particularly the diffusion speed of the Internet differs between countries and cultures (Park & Yoon, 2005) and hence so does the usage behavior. However, the applied data set of 119,829 Germans considered the regional distribution of Germany as well as the actual dissemination of gender, age and income. Therefore, our results are highly representative for the German population and can be used to identify technological EAs. Similar outcomes could be possible for other highly developed European countries and should be investigated by future research.

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3 Research Paper 2: "Analyzing Different Types of Negative Online Consumer Reviews"

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Abstract

Purpose – This study aims to investigate if different types of negative electronic word-of-mouth (eWOM) have various negative effects on the attitude of the consumer toward a product (Laptop) and whether this newfound attitude remains unaffected by the subsequent influence of positive eWOM.

Design/methodology/approach – A quantitative study in Germany was conducted. In the two-part experimental setting, first, a factorial repeated measures between-subjects design was used in which the types of negative eWOM have been manipulated. The second part is characterized by a mixed between–within subjects design to test the durability of attitudinal changes.

Findings – The results demonstrate that destructive and ethical eWOM only provoke a small decline in consumer attitude compared to functional product criticism. Furthermore, the examination shows that renewed positive eWOM can improve the attitude, whereas ethical criticism is the most difficult to correct.

Research limitations/implications – The study views negative eWOM differentiated. Researchers could adopt this approach by analyzing online communication more precisely. Ambivalent relationships between negative eWOM and their outcomes can be explained.

Practical implications – The findings lessen the fear of permanent loss of brand reputation caused by negative reviews. The harmful effects on the attitude can be compensated through targeted marketing management actions. The study shows which content companies need to focus on.

Originality/value – Previous literature has predominantly overlooked the complex nature of negative eWOM. Therefore, the study provides first empirical results about the divergent effect of different content types of negative eWOM on consumer attitude toward a product. Additionally, the durability of consumer negativity could be measured over time.

3.1 Introduction

Due to growing internet usage, the consumer's options for gathering product information about other users and to provide own consumption related advice has extended by engaging in electronic word-of-mouth (eWOM) (Hennig-Thurau et al., 2004). These days, consumers make purchase decisions based on online information (Kim et al., 2017). Thus, managers need to understand the influence of eWOM on behavioral outcomes (Kumar et al., 2017) and react by allocating larger portions of their marketing budget to manage online communication (You et al., 2015; Rosario et al., 2016).

However, not every eWOM has comparable impacts on consumer behavior. The dangerous character of negative eWOM and its harmful consequences regarding consumer attitude (e.g., Bambauer-Sachse & Mangold, 2011) has been discussed extensively as several studies verify that individuals weight negative cues higher than positive ones during the decision-making process (negativity bias theory) (e.g., Rozin & Royzman, 2001). Thus, negative eWOM has generated significant attention in current research and corporate practice (Kumar & Purbey, 2018). However, some studies find differences in the effects of negative reviews (e.g., Doh & Hwang, 2008). Therefore, the eWOM quality was identified to determine whether reviews are a valuable reference source for consumers' decisions making (Hung, 2017). To distinguish between high- and low-quality online reviews (Bambauer-Sachse & Mangold, 2011; Shihab & Putri, 2019) the quality of arguments was evaluated through different variables (e.g., relevance, timeliness, accuracy and understandability) and focuses on effective persuasion (Cheung & Thadani, 2012; Lee et al., 2008). Nonetheless, as the content's relevance of negative WOM has been insufficiently explored, Kim et al. (2017) and Sipilä et al. (2017) encourage to conduct in-depth analyses of review content. Therefore, different types of arguments in reviews might be categorized (Kim et al., 2017). To the best of our knowledge, the differentiation among various content types of negative eWOM has not been considered so far. The present study aims to fill this research gap and extends existing literature regarding how negativity towards a brand relates to negative eWOM (Cambefort & Roux, 2019) by analyzing the effects of various kinds of expressed negativity on the attitude toward a product.

This examination followed Wetzer et al. (2007), whose study reveal that the goals which talk about emotions are associated with destructive versus constructive types of content. Taking this into consideration, negative eWOM was divided into the content

types of constructive and destructive emotional criticism. According to Liu et al. (2018) and Baghi and Gabrielli's (2019) classification of negative brand publicity, constructive criticism was further separated into performance-based (functional) and values-based (ethical) criticism. Thus, this experimental investigation goes beyond previous research approaches, which concentered on what emotions lead to different kinds of negative eWOM. Instead, the present study analyzes if various types of negative eWOM differ in their effects on the initial positive attitudes of consumers towards a technological product (laptop). Accordingly, this research aims to investigate if direct product-related negative eWOM has, in principle, such a negative influence on customer product attitude. The results are discussed, considering the search and alignment theory of Muthukrishnan and Pham (2002).

In reality, consumers read eight or more reviews before making a decision (Jimenez & Mendoza, 2013) and thereby come across both negative and positive eWOM (Purnawirawan et al., 2015). If the various content types of negative eWOM cause different adverse effects, the question arises whether these effects remain consistent in the course of subsequent positive information. Communication research has previously examined the problem regarding the effects of the order of information presentation (Hovland et al., 1953; Belkaoui, 1977), highlighting the relevance of either the first (Gibbons et al., 2008) or the last received information (Garnefeld & Steinhoff, 2013). However, no studies to date have investigated the relationship among different types of negative eWOM and the durability of evoked consumer attitude. Consequently, in the second step of the investigation, this research gap was closed by analyzing to what extent the level of attitude, based on different types of negative eWOM, will increase again after being exposed to newly received positive eWOM. No further distinction has been made for positive eWOM as only its general impact on the durability of attitudinal changes caused by negative eWOM is relevant.

Considering the growing importance of eWOM (Carr & Hayes, 2014) and the lack of analysis of different content types of negative eWOM in current research, an investigation is of significant interest for practitioners and theorists. This study provides clear insights into what type of criticism most strongly provokes a decline in consumer attitude and what type is most difficult to reverse. Therefore, one theoretical contribution is to specify the inconsistent understanding of "argument quality" (Zhang et al., 2014). Practitioners benefit from the results as they illustrate that negative eWOM does not

necessarily mean an automatic loss of consumer attitude and buying intention. Thus, implementing systematic social media monitoring rises in importance to detect and react to harmful eWOM. As primarily the younger generation (digital natives) shows the highest level of trust and is actively engaged in eWOM regarding products (Bailey, 2005; Nielsen, 2015), the subsequent investigation focuses on this group.

The remainder of the article is organized as follows. First, the literature was reviewed related to the relevant eWOM investigation. Afterward, the theoretical background, as well as the hypotheses, are described. Next, the research design and the method used to test the hypotheses are revealed before the results are presented and discussed. Finally, theoretical as well as practical implications are derived and avenues for future research are identified.

3.2 Relevant Work and Theoretical Background

Following the call of Veloutsou and Guzmán (2017) to investigate negativity towards a brand more comprehensively, Osuna Ramirez et al. (2019) verified that having brand haters can help companies to improve their strategies by providing fruitful hints to make appropriate adjustments. To recognize such brand haters, they have to engage in WOM communication. The reasons why people engage in negative eWOM about a brand were identified to be diverse and either related to the kind of risk they are exposed to (Cambefort & Roux, 2019) or on the evaluation of brand hypocrisy (Guèvremont, 2019). An additional factor is the level of arousal of negative emotions. The higher the customers' arousal of negative emotions, the higher their intention to spread negative eWOM and the lower their intention to purchase the brand product (Baghi & Gabrielli, 2019). Further research raises the question of how to manage negative eWOM (Cooper et al., 2019). Therefore, it is essential to analyze negative eWOM more detailed.

Compared to positive content, negative reviews are perceived as more helpful regarding the localization and assessment of risks, increasing perceived usefulness (Yin et al., 2012). Furthermore, they were assessed as more sustainable than positive ones concerning the effect on the attitude towards a brand (Lee et al. 2009). However, current research emphasizes to differentiate negative eWOM, as some studies found differences in the effects of negative reviews (e.g. Doh & Hwang, 2008). While Lee et

al. (2009) only considered constructive product reviews in their analysis, other research distinguished between high- and low-quality negative online reviews to investigate the effect on product attitude (Shihab & Putri, 2019; Zhang et al., 2014). The quality of eWOM content was examined more detailed considering variables such as "richness of content or argument quality" and "strength of advocacy" of consumer reviews (e.g., Sweeney et al., 2012; Cheung & Thadani, 2012). According to Ruiz-Mafe et al. (2018), the quality of information is related to the credibility and usefulness of eWOM, which are central aspects of its adoption (Hajli, 2018; Lis, 2013) Thus, high-quality reviews were identified to be more persuasive compared to low-quality reviews (Zhang et al., 2014).

Explanations for these findings are provided by the elaboration likelihood model (ELM) of Petty and Cacioppo (1986), which is one of the most common and essential information processing theory indicating how persuasive messages impact consumers (Yan et al., 2016; Cheung & Thadani, 2012). Another analytical approach is given through the search and alignment theory of Muthukrishnan and Pham (2002). The theory describes the effect of opposite information on the revision of attitude and considers the process of the revision of an original mental image by newly gained information that contradicts the original setting. This approach seems to be most suitable for the experimental design of the present study as Bambauer-Sachse and Mangold (2011) have already empirically proven the search and alignment theory in the context of negative eWOM to explain effects on consumer-based brand equity. Through confrontation with the conflicting information, the consistency of the original information pool is disturbed and a new evaluation appears necessary. Depending on the evaluation of the incompatible facts, the original mental image may be retained or disturbed. If it is disturbed, a revision of the initial position is caused (Muthukrishnan & Pham, 2002). When new information becomes available, an active search for existing target information on the same topic begins. If no target information is accessible, an immediate revised judgment occurs towards the challenging content. However, if original data draws a different picture than the challenging input, the cognitive memory systematically searches for data supporting the original attitude. In this case, all pro-arguments that aim to defend the original image are retrieved (McGuire, 1964). The retrieval of the pro-arguments not only causes a defense of the original attitude but also allows simultaneous diagnostic evaluation of the conflicting information to what extent the

new data violate the old constitution of attitude (Markman & Zhang, 1998). If the challenging information is not evaluated as diagnostic, a defense mechanism is triggered. In the case of a diagnostic evaluation, a revised judgment is made regarding the challenge (Mungalé et al., 1999). In this context, Muthukrishnan and Pham (2002) note the importance of attribute-specific and abstract information. They understand attribute-specific information as data based on facts that highlight the certain specifics and characteristics of an object, whereas abstract information implies the summary of vast statements, which are characterized by their indeterminate nature. Fabrigar and Petty (1999) provided evidence that receiving attribute-specific information is more likely to cause a revision of attitude as this type of information is valued more diagnostically. To conclude, a revision of the attitude seems to occur only when the conflicting information is evaluated as diagnostic, making a consideration necessary whether information is attribute-specific or abstract. Therefore, the relevance of the negative eWOM content is of great interest and, according to Kim et al. (2017), has insufficiently been explored concerning an in-depth analysis of review content. No studies to date have differentiated among various content types of negative eWOM and analyzed the effects on consumer attitude. By comparing constructive functional criticism and constructive ethical criticism as predominantly attribute-specific with destructive criticism as abstract counter-information, this study aims to tribute to this lack of research.

According to Hennig-Thurau et al. (2004) and Martin (2017), differences in receivers' evaluation of the sender's motivation influence the assessment of a message. That might be caused as motivation affects the characteristics of eWOM communication (Yap et al., 2013). Thus, knowing about the emotions and the goals, regarding why people get engaged in negative eWOM is essential to understand the adoption of WOM. Wetzer et al. (2007) comprehensively reviewed WOM literature to identify primary goals for negative WOM and emotions that are relevant in situations that elicit negative WOM. In a second step, they examined the relationship between these emotions and the different goals. Deducing from the goals of selected emotions, they classified negative WOM according to their intention in two dimensions: constructive and destructive. What differentiates the following approach from previous examinations is, that it does not focus on negative eWOM-generating factors, such as emotions or goals of emotions, but concentrates on the impact of the different contextual types of

negative eWOM on consumer's attitude towards a technological product. As technologies are primarily produced to function (Verbeek, 2006) and the sales of environmentally friendly brands increase continuously (Lin et al., 2017; Leonidou & Skarmeas, 2017), current research intensively deals with the behavior towards ethical (e.g., Papista & Dimitriadis, 2019) and functional product characteristics (e.g., Auger et al., 2008). Therefore, this study distinguished between the impact of constructive functional, constructive ethical and destructive emotional criticism on product attitude.

Ullrich and Brunner (2015) detected that a positive consumer review could effectively counteract a negative review. Therefore, also the sequence of receiving online consumer reviews impacts how recipients process the information (Huang & Korfiatis, 2015). Former research is offering a first insight into the consistency of an attitudinal change as a result of WOM. Wang (2011) investigated the inconsistency of the WOM effect for the attitude towards a service and the intent to use the service. Thereby, he called attention to the importance of the primacy-recency effect in this research field. Several studies had highlighted the relevance of the first incoming information (e.g., Gibbons et al., 2008; Sparks & Browning, 2011), whereas others suggest that the last received information has more importance (e.g., Garnefeld & Steinhoff, 2013). Ruiz-Mafe et al. (2018) investigated interactions between systematic and heuristic information processing routes of online reviews influencing consumers' purchase decision making. Depending on different online review' sequences, either the heuristic or the systematic processing route dominates, leading to differences in decision making. None of the current studies has investigated the relationship between different types of negative eWOM and the durability of evoked consumer attitudes if the consumer is confronted with positive eWOM most recently. Crucial for companies is determining which type of criticism is most challenging to correct.

Table I below presents a summary of selected influential past research to provide an overview of previous eWOM investigation.

Table 1. Selection of influential past eWOM research.

Author(s)	Tested Construct	Key Finding(s)
Yin et al., 2012	Valence (positive vs. negative)	Negative reviews are more helpful regarding the localization and assessment of risks and therefore more useful.
Martin, 2017	Valence (positive vs. negative)	Differences in receivers' evaluation of the sender's motivation influence the assessment of a message.
Bambauer-Sachse and Mangold, 2011	High- quality negative online reviews	Detrimental effect of high-quality negative online reviews on consumer based brand equity
Zhang et al., 2014	Argument quality, informativeness, persuasiveness, source credibility and perceived quantity of online reviews	All constructs have a significant effect on consumers' purchase intention
Sweeney et al., 2012	Valence, cognitive content, richness of content and strength of delivery	Cognitive content and richness of content reflect the composition of the message, while strength of delivery, reflects the manner of delivery.
Wetzer et al., 2007	Specific goals when engaging in nWOM	Consumers various goals differ between the specific negative emotions that are experienced and are associated with destructive versus constructive outcomes.
Baghi and Gabrielli, 2019	The role of crisis typology in influencing consumers' negative response	The higher the customers' arousal of negative emotions, the higher their intention to spread negative eWOM
Wang, 2011	Sequence of WOM	Service quality perception and purchase intention were influenced more by the final WOM event than by the initial one.

3.3 Hypotheses

3.3.1 Differences in Various Types of Content

Although the relevance of ethical factors in the process of product purchase is considered increasingly important (e.g., Rokka & Uusitalo, 2008), an inconsistency between purchase intention and real action can be perceived (e.g., Luchs et al., 2010; White et al., 2012). This effect is especially observable during a trade-off between ethical factors and functional facts such as product-based aspects or price. Ethical factors are often subordinated to functional ones during the actual purchase situation (Luchs et

al., 2012; Auger et al., 2008). Thus, consumers look for functional benefits before deciding for an environmentally friendly product (Lin et al., 2017). Ehrich and Irwin (2005) even showed that consumers have an intended ignorance of ethical product information in order to avoid dealing with negative emotions and additional stress. This influence is stronger when the purchase decision has already been considered based on other product information available (Ehrich & Irwin, 2005).

To explain differences of constructive functional and constructive ethical criticism on changes in consumer attitude, the search and alignment theory can provide further explanations. According to this theory, attribute-specific compared to abstract information is evaluated as more diagnostic and thus has a greater influence on consumer attitude. While constructive functional WOM can be allocated to attribute-specific information (Bambauer-Sachse & Mangold, 2011), it is to discuss whether ethical reviews can be classified as attribute-specific or abstract information. According to Liu et al. (2018), negative ethical brand publicity was identified as highly diagnostic. However, consulting the means-end theory can provide a different perspective. This theory states that consumers see products as a means to important ends and try to evaluate how the selection of a product helps to achieve the desired end-state (e.g., Gutman, 1982). Thereby, the consumer hierarchizes the content of associations based on the level of abstraction, ranging from product characteristics on a low level to personal values on a high hierarchical level of abstraction (Reynolds & Gutman, 1984; Woodruff & Gardial, 1996). As complex personal values are assessed on a high level of abstraction (Zeithaml, 1988) and ethical beliefs and personal values strongly correlate (Steenhaut & van Kenhove, 2006), ethical reviews might be evaluated as rather abstract and thus as less diagnostic.

Finally, the signaling theory provides further clarifications postulating that consumers seek to decrease the degree of expected loss and thus minimize their risk before purchase by identifying cues signalizing a low probability of a flawed product (e.g., Zeithaml & Bitner, 2003). Minimizing this risk consumers put high trust in the senders' evaluation if their reviews are based on first-hand experience with a product. Consequently, the effect on the WOM adoption of the receiver will be positively influenced (Martin & Lueg, 2013). In contrast, if negative WOM is based on what reviewers have heard from others rather than their own experience with the product, the impact of WOM on the consumer may be lower (Martin, 2017). Ethical points of criticism do

not necessarily result from a first-hand experience with a product wherefore a lower influence can be expected.

As each group either received functional or ethical criticism in this investigation, the participants were not in a trade-off scenario and not exposed to real stress. Furthermore, they are not in an actual purchase situation but were asked about their product attitude. Nevertheless, the following hypothesis was assumed:

H1: Functional product criticism causes a greater negative effect on consumer attitude than ethical criticism.

While H1 compares two variants of criticism assessed as constructive, further constructive functional criticism and destructive emotional criticism were investigated. Even though there are some hints about different effects considering the two content types in current research, this study follows the theoretical approach of Wetzer et al. (2007) and analyzes differences of constructive and destructive written reviews on attitudinal changes. According to the search and alignment theory, constructive information is evaluated as attribute-specific and, thus, highly diagnostic. In contrast, destructive criticism is often based on anger and frustration (Wetzer et al., 2007). As self-focused anger fosters vindictive negative WOM (Grégoire & Fisher, 2008) and leads to attacking another party (Frijda, 1987), the applied manipulation of destructive criticism is based on unspecific expressions that create an unrelated statement without any deep content. These verbalized impressions are neither based on facts nor on elaborated justified findings and therefore fit well as abstract counter-information. Consumers exposed to such subjective content, which is based on no specific reason except taking revenge, were found to be less persuaded compared to those exposed to objective content (Park et al., 2007; Martin, 2017). Therefore, abstract information, presented in a destructive emotional style, should have a weaker influence on attitudinal change compared to constructive information (Muthukrishnan & Pham, 2002).

Additionally, successful eWOM communication is based on eWOM adoption, which describes the specific acceptance of the posted recommendation (Sussman & Siegal, 2003). Several studies verify that credibility is an elementary requirement for eWOM adoption (Yan et al., 2016; Lis, 2013). Thus, numerous studies have verified that an increase in source credibility leads to better attitude, acceptance (Petty et al., 1983; Ohanian, 1990) and purchase intention towards the described object (Hu et al., 2008).

Therefore, it can be assumed that credible negative eWOM has a greater negative impact on attitude and purchase intention than less credible eWOM. To identify information as credible, the arguments should be reasonable and have an internal consistency (Wathen & Burkell, 2002; Ali Shah et al., 2015). Furthermore, they should be phrased in a logical structure and be valid (Cheung et al., 2009; O'Reilly & Marx, 2011). Constructive reviews can be assessed to be credible as the argumentation follows a logical structure based on objective experiences, while destructive criticism is based on unspecific expressions to take revenge. Consequently, we propose:

H2: Functional criticism causes a greater negative effect on consumer attitude than destructive emotional criticism.

Explaining the differences between constructive ethical and destructive criticism regarding their influence on consumer attitude towards a product, the ELM can be used. According to the ELM, specific characteristics of received information determine consumers' motivation to process this information and influence their attitudes either centrally or peripherally (Petty & Cacioppo, 1986). Since ethical concerns regarding product offers are rising (Román & Cuestas, 2008; Stoeckl & Luedicke, 2015), the relevance of ethical product reviews can be assessed as high for consumers. Thus, they are involved in the review topic. Furthermore, this content type is based on stringent and logical arguments. According to the ELM, those factors lead to a high level of elaboration and an engagement in central-route processing. Destructive criticism, based on unspecific expressions without any deep content, makes one unable to engage in much thought about a review leading to process the information on the peripheral route (Petty & Cacioppo, 1986). This type of criticism is neither based on facts nor on elaborated justified findings and valid arguments. Hence, the information can be evaluated as low quality and less severe compared to ethical negative WOM that is grounded on elaborated justified findings. Such information involves a high level of harm severity (e.g., likely to cause health consequences), which leads to a greater motivation to process the information conscientiously and to retaliate against a company (Chiou et al., 2013; Grégoire et al., 2010). As both review types are comparable in the credibility of their sources (fictional online-forum), the level of online information severity and argumentation quality determine the degree of perceived negative change in brand evaluation (Chiou et al., 2013; Hung, 2017). This results in an expected greater influence of ethical criticism. Consequently, an information adoption caused by the engagement

in the central-route processing of information is more likely and stable compared to the peripheral route (Cheung et al., 2008; Petty & Cacioppo, 1986). Additionally, ethical based problems were identified to induce high negative emotional arousal (e.g., fear and anger). Considering that the level of arousal of negative emotions harmfully influences purchase intention (Baghi & Gabrielli, 2019), the following hypothesis was assumed:

H3: Ethical criticism causes a greater negative effect on consumer attitude than destructive emotional criticism.

3.3.2 Consistency of Attitude Change

Consumers are rarely confronted with only one-sided information about a product in the real world (Wang, 2011). Therefore, it is highly relevant to investigate the consistency of the adopted opinion. In particular, the resilience of consumers' opinions who revised their original attitude of a product and adopting the challenging information is of interest.

The discussion in current research concerning the status of input and output information is evaluated as inconclusive. Several researchers of associative theories assume that greater importance should be given to the recency effect (e.g., Garnefeld & Steinhoff, 2013), whereas others note the dominance of the primacy effect (e.g., Gibbons et al., 2008). Despite heterogeneous opinions, an essential insight can be deduced from these contrarian opinions: both the input information and the information last received appear to play a more significant role than the intermediate information (Danaher & Hansen, 1999; Wang, 2011). Applied to the present research design specified below, a positive-negative-positive information chronology suggests that the negative reviews becomes less important regarding the influence on product attitude. According to the search and alignment theory, only people who had a positive attitude towards the stimulus before the contact with the negative contents could be included in the analysis. Considering the confirmation bias first discussed by Watson (1968), people put more emphasis on information that is consistent with their beliefs, when they form an evaluation or buying decision (Edwards et al., 2009; Nickerson 1998). Thus, it is very likely that they give more weight to positive reviews that confirm their original attitude because these reviews are more consistent with their conviction. Thus, the following hypothesis H4 can be deduced:

H4: The positive product recommendations last read have a revised, positive effect on consumer attitude, regardless of the types of content.

Although, ethical criticism was expected to cause a smaller negative effect on product attitude than functional criticism, this smaller effect is assumed to be more robust in the light of renewed positive reviews. As WOM communication is assessed as a kind of social influence affecting consumers' belief (Arndt, 1967), people who are effectively influenced by ethical criticism are strictly guided in their purchasing decision based on the received information (Cowe & Williams, 2001). They first gather the ethical information provided in the negative reviews, which afterward gets set within their attitudes and perception of the social context (Newholm & Shaw, 2007). These ethical issues might become an important part of the consumers' self-identity leading to an adjustment of the behavioral intention (Shaw & Shiu, 2003). A person's self-identity is a relatively stable construct (Terry et al., 1999). Its elements, such as consumers' self-expression as well as the altruistic benefit created by the consumption of ethical products, can positively affect the relationship quality to ethical products (Papista & Dimitriadis, 2019). In contrast, ethical misconduct might negatively affect this relationship permanently as the more the reviews are lead to incongruence between consumers' self-image and product-image, the less likely the consumer is to forgive (Fetscherin & Sampedro, 2019). Furthermore, ethical criticism is perceived as a vivid type of information and, therefore, more accessible in memory than less vivid types (Herr et al., 1991). Thus, it can be assumed that the positive product recommendation last read had the slightest effect in the group of ethical criticism:

H5: Attitudinal changes caused by ethical criticism is most difficult to correct through positive product recommendations.

3.4 Research Design and Method

3.4.1 Experimental Design

An experimental setting in the form of an online survey was conducted to test the hypotheses developed. The basic form occurs in a randomized before-after measurement (Altobelli, 2007). To analyze the different impacts of negative reviews purposefully, three experimental groups are exposed to a manipulated stimulus, whereas a

control group proceeds without this experimental treatment. Thus, a randomized factorial repeated-measures design composed of three independent variables (types of criticism - constructive functional and ethical criticism, destructive emotional criticism) with a control group and one dependent variable (attitude towards the product) was used. For this between-subjects design, all groups were asked about their attitude towards the product after the presentation of the subject under investigation (laptop). Afterward, as part of the manipulation of the independent variables, four individual online reviews with different types of criticism and specific thematic focus were presented to each of the experimental groups. This procedure formed the groups of constructive functional, constructive ethical and destructive emotional criticism. However, the control group received four reviews with neutral statements. Subsequently, the surveyees were asked again regarding their attitude.

A factorial repeated-measures design also characterizes the second part of the investigation. Here, a mixed between-within subjects design was used to test the durability of attitudinal changes. Since consumers who are confronted with negative product information are likely to seek further information (Yu et al., 2019), all participants were instructed to imagine that the information given was not sufficient and that they discovered three positive reviews in their further research. It was clarified that the displayed reviews were the top-rated ones on the respective portal for the product, to consider the importance of reviews' trustworthiness (Lis, 2013). The manipulation of the second dependent variable included all themes and types of content that had been addressed in the previous negative recommendations. After the presentation of the second manipulation, the test persons were questioned about their attitude again. Consequently, this study could verify the general consistency of the attitude and further illustrate which type of criticism is most difficult to correct through positive product recommendations.

3.4.2 Data Collection and Sample

To collect data, an online survey was used. The questionnaire was posted mainly on social media. Additionally, e-mail lists of sport- and society associations were used to recruit participants. According to the search and alignment theory, only those participants who had a positive attitude towards the stimulus prior to the contact with the negative contents were included in the analysis. Consequently, the sample consisted

of 357 valid cases, most of whom were students. A total of 55.7 percent of the 18- to 53-year-old participants were female and 44.3 percent were male. The average age was $M_{age} = 23.32$. Accordingly, the sample predominantly consisted of the so-called Digital Natives (Prensky, 2001); wherefore, the results of the study might be slightly biased compared to the entire German population. However, this group is highly interested in the opinions of other users (Mizerski, 1982) and actively engages in eWOM communication regarding products and services (Bailey, 2005). They visit test report websites and comparison portals more frequently compared to the majority (VuMA Arbeitsgemeinschaft, 2018). Finally, Digital Natives are of great interest to companies when evaluating eWOM as they have the highest level of trust in consumer opinions posted online (Nielsen, 2015). Thus, analyzing their attitudinal changes is a sensible approach for offering essential insights to marketers. The randomized sample was segmented into three experimental groups and one control group based on the content types of criticism presented. The functional criticism group contained 79 participants, the ethical criticism group 101, the destructive criticism group 84 and the control group 93. A summary of the demographic data is given in Table IV in the appendix.

3.4.3 Design of the Subject of Investigation

A laptop was chosen as the subject of investigation since a computer already has been used in WOM research (Herr et al., 1991; Vázquez-Casielles et al., 2013). According to Lee et al. (2009), participants showed a relatively high interest in seeking other consumers' opinions on laptops. Due to the complexity of their technological features and a wide variety of available devices, as well as potentially high costs, many consumers tend to search for other consumer's reviews before purchase.

Following the example of Lee et al. (2009), the product name "Fanon X11" was used for the presentation of the fictitious laptop. This product name was chosen to develop a neutral and unknown brand that raises as few specific associations as possible (Lee et al., 2009). The depiction of the subject of investigation, based on Fabrigar and Petty (1999), contained information about primary technical data and a detailed product description in the form of a product sheet. The stimulus designed is the primary information base that should provoke a positive attitude and demand challenging information.

3.4.4 Operationalization

3.4.4.1 Independent Variables

After the informative presentation of the laptop, contrary information was necessary for the implementation of the study design. This paper used the distinction made by Wetzer et al. (2007), who classified negative WOM intention into two dimensions, namely constructive and destructive, related to the consumer's goals with which they talk about their emotions. Furthermore, Baghi and Gabrielli (2019) distinguished between performance-based (functional) and values-based (ethical) brand crisis. This separation has also been used by Auger et al. (2008), who compared functional and ethical product features of athletic shoes and bar soap. As ethical attributes such as sustainability and image rise in importance and became a crucial factor for influencing consumer attitude (Rokka & Uusitalo, 2008; Trude & Cotte, 2009) and functional aspects are assessed to be essential for a buying decision (e.g., Luchs et al., 2012) a further distinction between constructive functional and ethical negative eWOM seemed reasonable. Thus, two types of constructive and one type of destructive eWOM were presented as challenging information. Thereby, the destructive type of criticism is designed explicitly as abstract contra information as it contains no logical argumentation but merely emotional expressions.

Concerning the number of online reviews displayed, this investigation followed the study of Bambauer-Sachse and Mangold (2011) and presented three online reviews that refer explicitly to the experimental variables. To address the fear that the negative reviews would have an excessively powerful effect and deter a test person too strongly, each group received another identical fourth positive review.

The text length of the reviews depends on whether they tend to be based on stringent and logical arguments (high-quality) or are more emotional and full of subjectivity (low-quality) (Bambauer-Sachse & Mangold, 2011). Following Bambauer-Sachse and Mangold (2011), the length of an average logically and objectively structured, constructive review contains 350 words. To ensure that every participant reads the reviews in the questionnaire thoroughly, the average length of the texts was shortened to approximately 150 words. The wording of the "low-quality" destructive criticisms was accordingly shorter.

Many actual negative notebook reviews were examined to design the manipulation of

the three experimental groups as realistically as possible. Consequently, in addition to the writing style and punctuation, the most common reasons for negative customer reviews were identified. Unhandiness and comparatively poor performance were particularly noted as points of critique (Lee et al., 2009). The latter was used in the form of a faulty power supply of the laptop to construct the functional-critical manipulation. For the creation of ethical manipulation, topics were chosen that often arise in ethical discussions about a wide variety of products, e.g., ethical abuse in raw material extraction or environmental pollution (Wheale & Hinton, 2007; Irwin & Naylor, 2009). The manipulation through destructive emotional criticism consisted of offensive attacks and petty phrases, which are often observed in "shit storms" (Mavridis, 2012) and not based on verifiable facts. The control group received reviews that generated a neutral attitude towards Fanon and the notebook. The manipulation of all groups based on the tonality of Myers and Warner's (1968) compiled list of evaluated adjectives used to specify advertising impacts. Expressions that suggest a general dissatisfaction ("not good", "very bad" or "impossible") were chosen for the functional criticism. Similar expressions ("problematic" or "irresponsible") were applied for the ethical manipulation. The destructive criticism included more extreme terms, such as "horror" or "catastrophe". The control group was faced with terms that should evoke a more neutral attitude towards the notebook presented ("relative", "actually" or "average").

To create the second independent variable (positive eWOM), this study followed the mentioned aspects concerning the average number and the text length of reviews (Bambauer-Sachse & Mangold, 2011). All groups received three positive reviews, in each case, one with functional, ethical and destructive emotional aspects. According to the "negative recommendations", the functional and ethical review was longer than the destructive one. Besides, the importance of imparting purchasing-oriented information, which has a positive effect on the perceived eWOM credibility (Chih et al., 2013), was considered. Hence, critical functional characteristics, such as processor speed, display quality and weight, were chosen for the positive functional review (Nasir et al., 2006; Chitturi et al., 2007). For the ethical recommendation, the environmentally friendly nature of the manufacturing process was used (Rokka & Uusitalo, 2008), while the destructive written review included extreme terms, such as "awesome" or "amazing".

3.4.4.2 Dependent and Control Variable

Due to the essential role in the advertising industry, this study used attitude as its dependent variable. It is a central factor for measuring the advertising effect as it describes the inner disposition of consumers to react consistently (positive or negative) to a certain stimulus (e.g., Ajzen & Fishbein, 1975). Furthermore, attitude is an important antecedent of the behavioral intention to use innovative technologies (Davis et al., 1989). WOM communication is considered as a type of social influence that affects consumers' attitudes (Hanna & Wozniak, 2001). Thus, indicators to measure the attitude towards the stimulus were used, which Bambauer-Sachse and Mangold (2011) already validated to check the evaluation of a fictitious brand. Following the ABC model (Rosenberg & Hovland, 1960) as one of the most cited models of attitude (e.g., Van den Berg et al., 2006), the scale used included all three components of this model. Besides the affective and cognitive components taken together as product perception, this study considers product-related behavioral intention as the conative attitude component. The latter defines the outward behavior of a person (Bauer, 2008) and can be interpreted as an expression of an intended act of purchase. Therefore, an aggregated scale verified in a pretest ($n = 222$; $\alpha = .89$) was used to measure the product-based consumer attitude ($\alpha = .76$) (Bambauer-Sachse & Mangold, 2011). The level of agreement was measured using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). All variables and items used are visualized in the appendix in Table V.

Unintended confounding factors that may manipulate the main effect between the independent and dependent variables (Aaker et al., 2006) were collected using five control variables. All were queried separately on a seven-point Likert scale. First, it was asked about the self-relevance of the product attributes presented in the critiques (brand image, technical equipment, battery life/power supply, weight, warranty service, and ethical concerns "sustainability in the procurement and production") to examine a possible influence of different product attribute preferences on the later change of product attitude. As consumer knowledge is of particular interest to analyze and to understand consumer behavior, second, the knowledge of the specific product category "notebook" was examined to identify a possible influence on the change of attitude ($\alpha = .87$) (Coulter et al., 2005). Third, this study investigated whether the different experimental groups were comparable regarding the trust of the test person in online reviews

(α = .87) and fourth examined the general persuasiveness of customer-written online reviews (α = .84) (Bambauer-Sachse & Mangold, 2011). Fifth and after the presentation of the stimulus, respondents were asked to indicate how familiar they were with the "fictitious" brand Fanon. Through this process of questioning, the brand strength of the fictitious brand was assessed (Krieger, 2012).

3.5 Results

3.5.1 Manipulation Check

After the manipulation with the first independent variables, each group was asked to assess the presented reviews according to the recognized content: "The reviews contained mainly insults", "The reviews were objective", "The reviews referred to ethical aspects" and "The reviews referred to the performance of the product" to evaluate if the manipulation was successful. The level of agreement was queried on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).

The results of a one-way ANOVA demonstrated that the groups were successfully manipulated after the confrontation with the experimental variation. The groups differ significantly from each other in terms of the evaluation concerning the insults contained ($F(3,353) = 215.180$, $p < .001$), the objectivity ($F(3,353) = 98.118$, $p < .001$), the ethical dominance of the review ($F(3,353) = 222.733$, $p < .001$) and the assessment to what extent the criticism is related to the performance of the product ($F(3,353) = 85.567$, $p < .001$). The group receiving the functional criticism classified the treatment as most objective ($M_{\text{functional criticism – objective}} = 4.75$) and performance-related ($M_{\text{functional criticism – performance-related}} = 6.04$), while the group which obtained ethical criticism was the only group classifying the contributions submitted as reviews of an ethical nature ($M_{\text{ethical criticism – ethical}} = 5.70$). The group with destructive emotional criticism, however, identified the low objectivity ($M_{\text{destructive criticism – objective}} = 2.06$) of their reviews, which predominantly contained insults ($M_{\text{destructive criticism – insults}} = 5.86$). Thus, the respondents successfully identified all content types.

3.5.2 Test of Control Variables

The results of a one-way ANOVA showed that the four groups do not differ significantly from each other in terms of persuasiveness ($F(3,353) = 2.011$, $p = .112$) and trust ($F(3,353) = 1.816$, $p = .144$) towards online recommendations. Furthermore, no significant differences regarding knowledge about the product type notebook were determined ($F(3,353) = .840$, $p = .472$). Concerning the relevance of different types of product attributes, one significant difference in the form of the brand image could be identified between the groups ($F(3,353) = 2.863$, $p < .05$). Compared to the other types of content, the brand image is attacked directly by the destructive emotional reviews presented. The mean value of brand image importance is highest in the group of destructive criticism ($M = 4.49$) and lowest in the group of functional criticism ($M = 3.76$). Therefore, confirmation of H2 would strengthen its result. No further significant differences could be found concerning the relevance of product attributes (technical equipment: $F = .330$; $p = .804$; battery life/power supply: $F = 1.418$; $p = .237$; weight: $F = .089$; $p = .446$; product guarantee $F = .921$; $p = .431$; sustainability in procurement and production: $F = .573$; $p = .633$). A large gap in the group of ethical criticism (61 % female, 39 % male) was identified by examining the difference in the allocation of gender between and within the groups. Considering that female participants have a stronger interest in the ethical product attribute "sustainability in manufacturing process" than male participants ($M_{female} = 3.94$; $M_{male} = 3.59$), a confirmation of H1 would strengthen its result. The finding that women are more involved in and impressed by ethical traits is also found in other scientific research (e.g., Bateman & Valentine, 2010). Thus, it can largely be excluded that one of the variables mentioned influences the results in the form of a disturbance variable.

3.5.3 Hypotheses Test

The extent to which each group recorded a decline in its attitude after contact with negative eWOM was analyzed through a pair-sample t-test. Table 2 shows that the mean values of the attitude towards the product have decreased in all experimental groups. The t-test confirms that the negative differences between the pre- and post-measurement within the experimental groups differ significantly from each other ($p < .001$). However, the control group showed no significant decrease in the mean value. Thus, it can be assumed that the corresponding experimental treatment can explain the

deterioration of consumer attitude in the experimental groups.

Table 2. Change in customer attitude caused by negative eWOM.

			Consumer Attitude	Mean	Difference	T-Value	df
Experimental Group	**Constructive eWOM**	Functional Criticism (n = 79)	Before negative eWOM	**4.92**	**-2.13[a]**	**15.2*** **	**78**
			After negative WOM	**2.79**			
		Ethical Criticism (n = 101)	Before negative eWOM	**4.96**	**-1.00[b]**	**10.5*** **	**100**
			After negative eWOM	**3.96**			
	Destructive eWOM	Destructive Criticism (n = 84)	Before negative eWOM	**5.01**	**-1.29[b]**	**11.2*** **	**83**
			After negative eWOM	**3.72**			
Control Group	**Neutral eWOM**	Neutral Criticism (n = 93)	Before negative eWOM	**5.05**	**-0.09[c]**	**1.2**	**92**
			After negative eWOM	**4.96**			

Note: * $p < 0.05$ ** $p < 0.01$ ***$p < 0.001$.
The values of the differences with various letters differ significantly ($p < 0.05$) between the groups.

At this point, however, it is not yet clear whether the reductions in consumer attitude differ significantly from each other between the groups and how strongly these differences should be assessed. Therefore, a one-way ANOVA was used to determine the strength of the intergroup-specific differences.

The measured mean differences of the pre- and post-variables for assessing the consumer attitude differ significantly from each other between the group of constructive functional and ethical criticism ($M_{\Delta \text{ functional criticism}} = -2.13$, $M_{\Delta \text{ ethical criticism}} = -1.00$; $F(3, 353) = 60.402$, $p < .001$). Thus, these two groups show an unequal decrease in attitude whereupon H1 can be confirmed: The content types of functional criticism cause a significantly stronger revision of consumer attitude in comparison to ethical criticism.

H2 concluded that constructive functional criticism causes a greater revision of consumer attitude than destructive eWOM. Because the differences in mean values to evaluate the consumer attitude are significantly higher in the group of constructive functional criticism than in the group of destructive criticism ($M_{\Delta \text{ constructive product criticism}} = -2.13$, $M_{\Delta \text{ destructive criticism}} = -1.29$; $F(3, 353) = 60.402$, $p < .001$), H2 can also be confirmed.

Surprisingly, differences in the change in attitude within the constructive ethical and the destructive emotional criticism group do not differ significantly after displaying the respective negative reviews ($M_{\Delta \text{ ethical criticism}} = -1.00$, $M_{\Delta \text{ destructive criticism}} = -1.29$; $F(3, 353) = 60.402$, $p > .05$). Therefore, H3 has to be rejected.

H4 assumed that the positive product recommendation read last has a renewed positive

effect on consumer attitude. Accordingly, all groups should record a significant improvement in consumer attitude after being confronted with the described positive online reviews.

Again, a pair-sample t-test was used to ascertain an improvement in consumer attitude within each group. Table 3 illustrates that all groups show a significant improvement ($p < .001$) in consumer attitude compared to the previous measurement. Accordingly, H4 can also be confirmed.

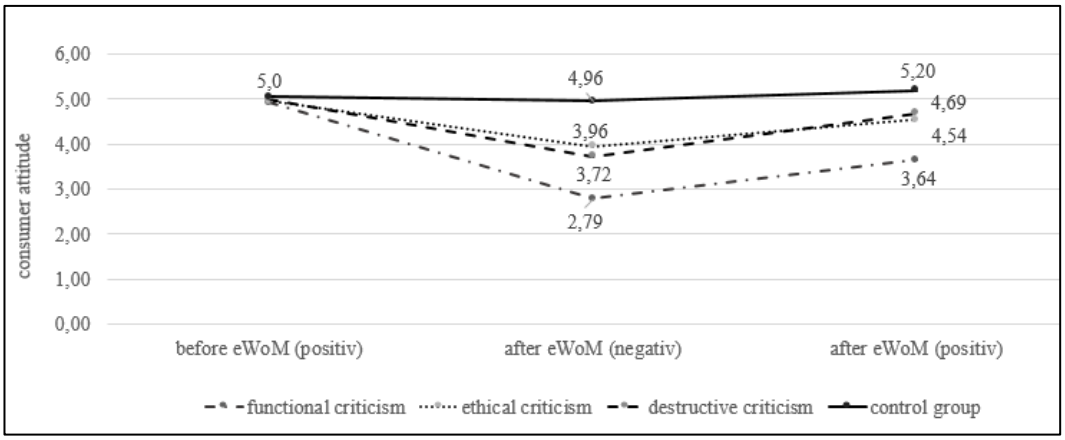
Table 3. Change in customer attitude caused by positive eWOM.

			Consumer Attitude	Mean	Difference	T-Value	df
Experimental Group	**Constructive eWOM**	Functional Criticism (n = 79)	Before positive eWOM	**2.79**	**0.85**	**-8.1*** **	**78**
			After positive eWOM	**3.64**			
		Ethical Criticism (n = 101)	Before positive eWOM	**3.96**	**0.58**	**-8.6*** **	**100**
			After positive eWOM	**4.54**			
	Destructive eWOM	Destructive Criticism (n = 84)	Before positive eWOM	**3.72**	**0.97**	**-10.3*** **	**83**
			After positive eWOM	**4.69**			
Control Group	**Neutral eWOM**	Neutral Criticism (n = 93)	Before positive eWOM	**4.96**	**0.24**	**-5.0*** **	**92**
			After positive eWOM	**5.20**			

Note: * p < 0.05 ** p < 0.01 *** p < 0.001.

In addition, there are significant differences in the increase of mean values between the groups ($p < .001$). Figure 1 visualizes the development of the consumer attitude along all times of measurement and between every research group. By comparing the experimental groups, the slightest improvement in consumer product attitude can be observed for the group of ethical criticism after the manipulation with positive eWOM. Thereby, the values of improvement between the groups of ethical and destructive criticism ($M_{\Delta \text{ destructive product criticism}} = .97$, $M_{\Delta \text{ ethical criticism}} = .58$; $F(3, 353) = 16{,}584$, $p < .001$) as well as between the groups of functional and ethical criticism ($M_{\Delta \text{ constructive product criticism}} = .85$, $M_{\Delta \text{ ethical criticism}} = .58$; $F(3, 353) = 16{,}584$, $p < .05$) differ significantly. Therefore, H5 can be supported.

Figure 1. Change in customer attitude caused by negative and positive eWOM.



3.6 Discussion and Implications

3.6.1 Discussion of the Results

The first research goal of the presented investigation was showing that different types of negative eWOM have a varying negative effect on the consumer's initial positive attitude. The results of this highly relevant business topic indicate that there are indeed significant differences. Functional criticism affects consumer attitudes noticeably stronger than ethical and destructive emotional criticism. Nonetheless, these two types surprisingly induce similarly great changes in attitude.

Since attribute-specific information is valued more diagnostically, constructive functional criticism causes a much stronger revision in consumer attitude in the direction of the challenging input than destructive emotional criticism. Ethical criticism cannot cause similar changes in attitude compared to functional criticism, despite its constructive and objective nature. Therefore, the results confirmed that ethical attributes, compared to functional characteristics, play a subordinate role during the consumer's buying decision making process of an electronic product. This finding seems to be so established that even destructive criticism causes similar changes in attitudinal change.

The second step was to examine the extent to which the change in attitude remains unaffected by the influence of a positive eWOM noticed subsequently or whether there is another adjustment in the direction of the initial positive perception. The results show that after exposure to the positive reviews, a renewed improvement in consumer product attitude occurs throughout all experimental groups. This result is remarkable because it assumes no universal risk regarding negative eWOM.

In the case of ethical criticism, the presented results show a significantly weaker revision of consumer attitude in comparison to the other experimental groups. However, if the consumer's negativity is based on ethical criticism, the investigation is also able to show that a further increase in attitude by positive information is particularly challenging compared to all other types of content. Hence, this fact is of particular interest, considering that previous research has not addressed them accordingly. As a company can analyze what types of negative eWOM they are faced with, their fear of negative customer reviews can be remove by this result.

3.6.2 Implications

3.6.2.1 Theoretical Implications

As mentioned, certain studies indicate the dangerous nature of negative WOM and warn about the harmful effects on consumer attitude (Bambauer-Sachse & Mangold, 2011). This study provides relevant insights that serve as a possible explanation to which extent negative eWOM has, in principle, such a negative influence on customers' product attitude. It has been empirically proven that negative eWOM might have a negative influence on product attitude. However, the findings do not imply that a general danger can be assumed automatically. Instead, it seems more sensible to differentiate precisely between adverse effects. These results extend beyond previous research and show that these differences depend on various content types. Destructive or ethical negative eWOM only provoke a small decline in consumer attitude. Therefore, one can consider both types as less devastating compared to constructive functional criticism. Taking into account that "argument quality" is an important indicator for the behavioral intention (e.g., Ruiz-Mafe et al., 2018) and the extent of how diagnostic a message can be assessed, this study can help to specify the inconsistent understanding of this term in existing literature (Zhang et al., 2014). Thus, not only abstract versus attribute specific (e.g., Muthukrishnan & Pham, 2002) or constructive versus destructive content (Wetzer et al., 2007) can be compared, but also, the gradations within these distinctions can lead to significant results concerning consumers' attitude. This could be observed by comparing the two constructive review types, namely functional and ethical criticism. Accordingly, previous research in negative eWOM comparing high- and low-quality reviews (Bambauer-Sachse & Mangold,

2011; Zhang et al., 2014) can be complemented by investigating argument quality effects in terms of different content types. The current investigation also emphasizes the specific role of emotions and motives of consumers who wrote reviews as it provides indications that these factors seem to play an important role for the receivers to evaluate eWOM (Wetzer et al., 2007; Martin, 2017).

Furthermore, the results underline the special characteristics of ethical criticism. Although this type of criticism has a constructive nature, it causes a relatively weak revision in consumer attitude. As ethical values are assessed on a high level of abstraction (Zeithaml, 1988), according to the means-end theory, ethical reviews might be evaluated as rather abstract and, thus, as less diagnostic. This evaluation is in line with the obtained results and might help to explain further outcomes that observed ethical factors to be often subordinated to functional principles during an actual purchase situation (Luchs et al., 2010; White et al., 2012). Nonetheless, beyond previous research, it is central to note that a mental image shaken by negative ethical reviews stays robust in the light of continuing positive eWOM. The findings contradict the result of Luchs et al. (2010), who showed that the negative impact of sustainability on product preference could be attenuated using explicit cues about product strength. This is of particular interest for further theoretical considerations in this domain, as ethical behavior results in higher customer loyalty (Lin et al., 2017).

3.6.2.2 Practical Implications

The findings of this study imply that consumers can distinguish between various content types of negative eWOM. Consequently, negative eWOM does not necessarily result in an automatic loss of brand reputation and willingness to purchase. From a managerial perspective, negative reviews require a more precise assessment. Companies should consider which aspects of reviews must be taken more seriously. Especially as eWOM has become a crucial factor for companies' social media marketing (Hussain et al., 2017), constant and premature monitoring of online-based conversations on relevant platforms gains in importance (Karakaya & Barnes, 2010). This procedure was identified as a successful strategy to avoid negative eWOM processes right at the beginning (Bronner & de Hoog, 2010). The results obtained clarify that especially constructive functional criticism has a significant impact on consumer attitude

and should receive special attention. Thus, companies that are already affected by negative eWOM should filter the most trustworthy online reviews (Lis, 2013) by browsing the internet for phrases of functional criticisms concerning their offers. By investing primarily in the processing of such kind of criticism, firms can improve the allocation of resources and optimize their goals concerning the attitude towards their company. Since altruistic consumers were recognized to write constructive WOM (Hennig-Thurau et al., 2004; Wetzer et al., 2007), companies should try to detect and focus their efforts on solving the problems that triggered the publication of negative eWOM within this group. The latest social applications and technologies enable concerned departments to monitor eWOM in real-time (Dellarocas & Narayan, 2006) and to program an algorithm, which can help to identify harmful content. These developments help to save money and time for affected companies (Panichella et al., 2015). However, destructive emotional criticism was identified to only cause minor damages to consumer attitude. Therefore, it is not unconditionally advisable to respond to this content type oneself but instead to facilitate access to a companies' social media presence where users get the ability to defend the company attacked by others (Cooper et al., 2019). The public sense of justice might help to defend against aggressive and subjective content of product haters based on the emotion of taking revenge (Wetzer et al., 2007). Recognizing such haters as an out-group can further strengthen the ties within the supporters (Osuna Ramírez et al., 2019) and lead to effective defending behavior in the form of positive reviews (Ullrich & Brunner, 2015). Consequently, neither ignoring negative product comments nor responding aggressively is recommendable (Kimmel & Audrain-Pontevia, 2010), but a thorough evaluation of the content type helps in the selection of an appropriate reaction.

Further results of this investigation emphasized that negative effects on attitude can be partially converted through confronting consumers with new positive information. An improvement in consumer attitude is the consequence, especially for those who had a positive attitude prior to contact with negative eWOM. This finding appears to be essential because it can eliminate the fear of permanent damage to reputation caused by negative online reviews. As negative eWOM does not necessarily cause an irreversible change in consumer attitude, companies can counteract by targeted marketing management actions, for example, in digital complaint management. Furthermore, the ben-

eficial effect of positive eWOM can be accelerated by a target-orientated communication with opinion leaders in social networks in order to provoke electronic WOM processes that spread this positive information (Vázquez-Casielles et al., 2013).

Another significant result obtained concerns about ethical criticism. People who are effectively influenced by ethical criticism are strictly guided in their purchasing decision based on the received information (Cowe & Williams, 2001) because green brands provide a specific value offering that strengthens loyal consumer behavior (Ahmad & Thyagaraj, 2015). Thus, once a product receives ethical criticism, the resulting negativity towards a product is not as easy to reverse again compared to other types of negative eWOM. This phenomenon could closely relate to the rising importance of CSR (Du et al., 2011). Regaining the customers' trust takes a long time if a company had violated ethical regulations publicly. Thus, it is necessary to take active measures to avoid ethical accusations (Vanhamme & Grobben, 2009) instead of just reacting to this type of criticism. Designing and implementing an effective CSR strategy and reputation or risk management are possibilities to counter ethical criticism and to strengthen consumers' brand attitude and company-identification (e.g., Huang et al., 2017; Du et al., 2010). Such a CSR strategy can be implemented by integrating potential customers into the development and production process so that the whole procedure becomes transparent for them. This procedure might lead to a decreased likelihood of ethical concerns because of a greater identification with the company and a determined defending behavior of loyal customers.

3.6.3 Limitations and Further Research

Although the results of the experimental design have provided clear insights, certain restrictions must be made. To criticize the search and alignment theory, the revision or resistance of judgment can also depend on further influencing factors. Therefore, other studies should consider the relevance of personality traits, individual preferences or social background. These factors can also influence the judgment of a consumer regarding brand evaluation and purchasing intention (Wang, 2011). Furthermore, the findings might be limited because this study only used one stimulus (a laptop) and focused on the group of digital natives (mainly students). As this customer group puts the highest level of trust in consumer opinions posted online (Nielsen, 2015), the re-

sults of this study show a slight bias compared to the entire German population. Therefore, it would be interesting for additional studies to vary the sample and the stimulus (product categories) to obtain diversified insights.

Besides, different content types of negative eWOM do not necessarily have to be purely constructive or destructive; mixed forms are also conceivable. Because researchers thus far have rarely examined different content types of negative customer reviews, this area offers significant potential for future study. Therefore, further content types and dimensions can be investigated, such as a distinction between the self- vs. other-focus regarding the motivation to write an online review (Wetzer et al., 2007). The impact of various content types of negative WOM could also be analyzed considering other essential factors. Thereby, the popularity of a brand or the identification of the recipient with the sender of a message can be investigated. As Lee et al. (2009) and You et al. (2015) suggest, the type of website on which consumers search for information can also be included in further analyses. In this context, social website content could be compared to reviews on shopping or product comparison websites.

As already discussed, a decrease in attitude based on ethical criticism is difficult to repair. Hence, a detailed investigation of the assumed relationship between the effects of ethical eWOM and CSR initiatives is highly relevant. To better understand the mechanism of CSR's impact on economic success, these analyzes could be beneficial for this branch of research. Analyzing this issue, it is advisable to devote special attention to the trust aspect (Park et al., 2014).

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4 Research Paper 3: "A Generation Comparison of Mobile Payment Acceptance Factors: An Empirical Investigation"

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Abstract: Many unsuccessful initiatives for establishing technological solutions of mobile payment (m-payment) services in stationary trade have been detected in the past few years. Therefore, following research deals with possible explanations for insufficient diffusion. A lack of research was analyzed by investigating the moderating effect of being a Digital Native (DN) or Digital Immigrant (DI) regarding technological factors influencing the attitude towards using m-payment systems. Our findings deepen the understanding of consumers' needs and personal characteristics in the adoption of m-payment technology. The theoretical basis is built on a modified TAM and Prensky's (2001) cultural generation concept. Hence, the technical field of m-payment is connected to a theory of identity. The study results displayed a greater degree of technological affinity concerning all factors examined in the group of DNs. By using a moderated regression analysis, we verified the negative influence of perceived security and risk having a significantly stronger effect on the attitude of DIs. Additionally, further results confirm the enormous importance of security in innovative payment processes. The results reinforce the importance of a target group-specific communication of an easy and secure payment-transaction to DIs. Furthermore, divergence of former research could be explained through the results of our cultural approach.

4.1 Introduction

Technological advances in the market for mobile devices have led to completely new mobile application fields over the past decade. Consequently, these devices become indispensable for modern digital society, as one can see by the fact that 49 million Germans own smartphones (Statista, 2016). The mobile phone has developed from a communication tool to a multifunctional information system. To meet the increasing need on mobility and facilitate the payment process, there had been some efforts to enable mobile phones to pay directly at the point-of-sale (POS) in the 1990s (Lerner, 2013). Companies introduced diverse services onto the market as a practical realization of this technology. Regarding the actual distribution, the Near Field Communication (NFC) technology or the scan of a Quick Response (QR) code are the most notable systems used to transfer data (Neßler, Lis, & Fischer, 2016). Our investigation concentrates on mobile payment (m-payment) processes at the stationary POS. This subcategory of m-payment is called "proximity mobile payment," which is defined by a physical presence of the customer as well as a physical infrastructure in trade (Slade, Williams, Dwivedi, & Piercy, 2015; Smart Card Alliance, 2007). We justify this focus because the stationary POS is the trading form with the highest sales volume of 411.3 billion € in Germany (GfK, 2016). So far, 70 percent of Germans have not paid by mobile at all (PwC, 2016) and none of the m-payment systems could satisfy the heterogeneous customers' needs. The latter include technical aspects, such as ease of use or perceived usefulness (Arvidsson, 2014; Dahlberg, Mallat, & Öörni, 2003; Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014) and psychological factors, such as trust and security (Dahlberg et al., 2003; Köster, Matt, & Hess, 2016), and differ between age groups (Gurtner, Reinhardt, & Soyez, 2014; Liébana-Cabanillas et al., 2014). To explain the missing acceptance, international researchers investigated a huge number of acceptance factors to analyze their influence on m-payment adoption (Arvidsson, 2014; Dahlberg & Öörni, 2007; Mallat, 2007). Studies show that behavioristic aspects, such as experience and competence, and demographic factors, such as age, play an important role in the context of mobile payment acceptance (Dahlberg & Öörni, 2007; Gurtner et al., 2014; Liébana-Cabanillas et al., 2014). These results indicate a first assumption of possible differences between the generations of "Digital Natives" (DNs) and "Digital Immigrants" (DIs) in technical factors (Prensky, 2001). The cultural concept of DNs and DIs is often used in the analysis of technological

issues (Hoffmann, Lutz, & Meckel, 2014; Metallo & Agrifoglio, 2015). The DNs are people born in the digital age and raised on innovative information system technologies. Therefore, one expects high affinity resulting in more acceptance of new technologies. By contrast, the DIs are forced to appropriate the information technology by themselves. Hence, a lower level of technological affinity is expected of this group, which leads to acceptance problems (Vodanovich, Sundaram, & Myers, 2010). Reviewing current m-payment literature, we identified a lack of research by investigating the identity characteristics of consumers (Liébana-Cabanillas et al., 2014; Slade et al., 2015). Thus, the aim of our investigation was to combine the technical field of m-payment with the generation concept of being a DN or DI. Through this approach, we were able to apply former specific research using the named generation concept concerning the design and marketing activities on m-payment systems (Gurtner et al., 2014; Holt, Shehata, Strömbäck, & Ljungberg, 2013; Tilvawala, Myers, & Sundaram, 2011). Related to the practice, latest news of paying for withdrawing money from cashpoints in Germany (Reiche, 2017) makes one think of practical alternatives to paying with cash. Therefore, our motivation was to understand attitudinal aspects regarding m-payment to improve the systems for the greatest possible number of customers. We achieved this by the integration of the theory of DNs and DIs to examine the moderating effect of age. Based on this theoretical generation concept, we investigated the technical factors "perceived usefulness" and "perceived ease of use" incorporating Davis' (1989) "Technology Acceptance Model" (TAM). Additionally, we examined perceived security in our model, because of its enormous relevance in payment transaction processes (Levente & Sandor, 2016). Hence, we conducted a moderated regression analysis to empirically test the impact of the variables mentioned on the attitude towards using m-payment services. The results of the study show significant influences of all variables on the attitude towards using m-payment systems. Thereby, we observe a greater degree of technological affinity over all factors in the group of DNs. Furthermore, we identify security and risk having the highest impact on attitude and being moderated by generational characteristics. Our findings deepen the understanding of consumers' needs and personal characteristics in the field of m-payment technology. The detailed description of both generations allows a more precise investigation of relevant influence factors on the attitude towards m-payment. This enables us to generate more target-oriented recommendations to all institutions participating. Thus, the relevance of the investigation conducted is justified through the

enormous potential of generation-segmented market cultivation. The remainder of our paper is organized as follows: Firstly, we review the current research in the field of m-payment. We then explain the theoretical background and develop our hypotheses. The following two sections deal with the research methodology and the presentation of our results. Finally, we discuss our research findings, create theoretical and practical implications, outline the limitations and show approaches of future research.

4.2 Current Research

The acceptance of mobile payment methods is a fixed object of international consumer behavior research. The first studies on this topic took place in 2002, whereas the number of publications increased significantly five years later (Slade, Williams, & Dwivedi, 2013). Several theories have been proposed as a basis for adoption models of m-payment services: The TAM by Davis (1989), the diffusion of innovation (DOI) postulated by Rogers (1995), and the unified theory of acceptance and use of technology (UTAUT) proposed by Venkatesh et al. (2003) (Dahlberg, Guo, & Ondrus, 2015; Dahlberg, Mallat, Ondrus, & Zmijewska, 2008). These models were modified and enhanced for m-payment research through specific factors. In this context, the German researcher Pousttchi (2005) identified technology-related factors that contribute to the acceptance of m-payment systems. It turned out that consumer-based systems should be essentially secure, easy to use and cost-effective. Bernet (2014) designed a specific acceptance model of m-payment systems based on the TAM. Consequently, perceived risk by users as well as perceived user-friendliness of payment systems are the most important determinants of consumer acceptance. Tan et al. (2014) also extended the TAM with the factor of financial-related risk. In contrast to Bernet (2014), risk was not found to have a significant impact on the behavioral intention. In a qualitative survey, Mallat (2007) as well as Dahlberg and Öörni (2007) identified factors such as security and trust, compatibility, complexity and relative advantage of mobile payment systems as very important variables. Furthermore, Dahlberg and Öörni (2007) combined their qualitative survey with a quantitative approach in order to test the influence of mentioned factors on the willingness to use m-payment methods. In addition to the technical issues, the authors determined three consumer-specific factors: Age, level of education and competence in the handling of mobile devices. The variables of education and competence in the handling of mobile devices influence the user's willingness

to use positively. Age, on the other hand, is negatively related to willingness to use (Dahlberg & Öörni, 2007). Further research concerning the aspects of age was conducted by Gurtner et al. (2014). They identified a lack of research by investigating and evaluating differences in the perception of attitudes like usefulness, perceived ease of use and convenience between age groups regarding mobile business applications. Their results show, that convenience is the dominant factor for DNs. For elderly people, ease of use gains in importance, which should be taken into account when designing applications. In the research area of m-payment Liébana-Cabanillas et al. (2014) examined the influence of age on the acceptance of text message payment systems based on the TAM. Their sample was divided into two groups based on the median age (35 years) and then subjected to a comparison. To summarize, the younger group showed more acceptance towards text message payments than the older group. The confidence in the payment method was comparatively higher (Liébana-Cabanillas et al., 2014). An examination of the concept of DNs and DIs with the focus on technical aspects and proximity m-payment did not take place. Looking at the acceptance factors identified, it is notable that they can be divided into two categories: Both functional aspects of the system, such as ease of use, as well as personal characteristics are relevant. The latter refer to behavioristic and demographic features, which again allow concluding differences in acceptance between generational groups. Explicit generation-specific acceptance studies, however, have not yet taken place in the context of m-payments, as the analysis of the research discovered. Though, the strong presence of the TAM in this research area (Slade et al., 2015) is noteworthy and reinforces the suitability of the model as a basis for this investigation.

4.3 Theoretical Framework and Hypothesis

4.3.1 A Modified TAM

Based on the theory of Ajzen and Fishbein (1980), Davis suggested the TAM in 1989. Lee et al. (2003) postulated the TAM to be one of the models most used and empirically verified to analyze customer acceptance of technological systems. Hence, many researchers have used the TAM to examine the adoption of m-payment (Arvidsson, 2014; Bernet, 2014; Dahlberg & Öörni, 2007; Keramati, Taeb, Larijani, & Mojir,

2012; Liébana-Cabanillas et al., 2014). According to the TAM, two main factors: "perceived usefulness" and "perceived ease of use," impact the acceptance of new technologies. Davis defines "perceived usefulness" as "the degree, to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). In contrast to that, Davis understands "perceived ease of use" as "the degree, to which a person believes that using a particular system would be free of effort" (Davis, 1989). In this context, one assumes a system with a high value on "perceived ease of use" to be more useful. Therefore, the aspect "perceived ease of use" is suggested as having a positive influence on "perceived usefulness." Both factors impact the individual's attitude towards using a technology. Together with "perceived usefulness," these two variables affect the behavioral intention, which finally impacts partially the actual use (Park, 2009). The "acceptance model of mobile payment systems" by Schierz et al. (2010) does not include a separate recording of the variable actual use. This reduction is justified by the fact that it is not possible to monitor the actual use of consumers adequately in view of the early stage of development of m-payment systems at the time of the survey. Consequently, instead of observing the concrete behavior, only the behavioral intention can be examined to draw conclusions about the future acceptance. The authors, however, still refer to the construct "attitude," as this determines the intention to use new technologies significantly (Davis, 1989; Park, 2009). Furthermore, the researchers enhance the remaining "core TAM" factors through "perceived security," "perceived compatibility," "subjective norm" and "individual mobility." The constructs and items were chosen on the basis of previous research. Their model is proved to be reliable and valid and all independent variables show significant effects on attitude towards using as well as intention to use m-payment services (Schierz et al., 2010). As our investigation approaches the moderating effect of being a DI or DN and technical factors, we were forced to reduce the model named above. Hence, we eliminated the factors "compatibility," "subjective norm" and "individual mobility." The former does not show significant influence on an individual's attitude to adopt m-payment services in the study of Arvidsson (2014). Additionally, Kim et al. (2010) could not support their hypotheses of technological compatibility having a positive influence on "perceived ease of use" and "perceived usefulness". Focusing on technical factors, "subjective norm" and "individual mobility" are not part of our examination. Instead, we concentrated on the aspects "perceived

ease of use" and "perceived usefulness" of the TAM and the factor "perceived security." The variables of the TAM have proven to be reliable instruments with high quality and measurement properties (Davis, 1989; Pavlou, 2003). As almost all innovations include risks, Antioco and Kleijnen (2010) found functional and performance risk to be negatively related to adoption intention of technological innovations. Perceived risk and security play an important role, especially in the field of sensible transactions, such as the payment process (Henkel, 2001). The fear of fraud in electronic payment transactions also becomes an essential issue (Levente & Sandor, 2016). Thus, we analyzed the "perceived security" of the mobile payment services concerning the fraud and information risks. In contrast to Schierz et al. (2010), we renounced a separate recording of the relationship between the attitude and the behavioral intention to use. This is because a lot of studies have already confirmed this connection and, therefore, no additional examination seems necessary (Meharia, 2012; Schierz et al., 2010). On the other hand, no evidence for generational differences between these relationships could be found, thus, it can be neglected in terms of the investigation to determine generation differences.

4.3.2 The Generation Concept of Digital Natives and Digital Immigrants

The concept of DNs and DIs is one of the most widespread generational differentiations of today. Originally conceptualized by Marc Prensky in 2001, the dichotomy has been the foundation for most research issues concerning generational gaps in the context of digitalization so far (Jandura & Karnowski, 2015). Prensky defines those who grew up with digital technology, such as computers, video games and the World Wide Web, as DNs. By contrast, DIs refer to the older generation who adapted digital technologies as an integral part of everyday life at some stage in adulthood (Hoffmann et al., 2014; Prensky, 2001). Correspondingly, the generational differences in terms of both the basic way of life and the usage behavior of modern technology are regarded as substantial (Harris, Cox, Musgrove, & Ernstberger, 2016; Prensky, 2001). The DNs have spent their entire lives surrounded by new information and communication technologies and consequently are associated with a higher level of affinity (Palfrey & Gasser, 2008; Prensky, 2001; Süss, Lampert, & Wijnen, 2013). Thus, they use modern technology systems intuitively and cope with their everyday practices, such as communication, information provision and consumption, intensively with the help of those

innovations (Frieling, 2010; McCormack & Poole, 2009). Their extensive openness and willingness to experiment with modern procedures and information technologies is striking (Tapschott, 1998). They use these information systems typically to explore their environments and identities in the world (Vodanovich et al., 2010). Unlike their DI counterparts, they often act as "early adopters," applying the newest products and technologies shortly after market release. Along with this, they are more comfortable with taking usage risks, such as the disclosure of personal data, than older consumers (Bitkom, 2011). In this context, DNs are often regarded as relatively ingenuous and careless (Hoffmann et al., 2014). The DNs have intertwined the digital world and its numerous technologies as a part of their daily lives more than the DIs. Even though many DIs have become proficient users of technology, their use differs significantly from their DN counterparts. The DIs are believed to oppose the newest technologies or rather have some technology acceptance difficulties (Vodanovich et al., 2010). It is assumed that their use of technology is less common and more cautious compared to younger users (Bitkom, 2011). This behavior is based on the altruistic social and conservative-traditional values of the DIs (Franz, 2010). According to Prensky (2001), DIs are capable of acquiring distinctive skills in the use of modern technologies, but they will always retain traditional usage behavior from the past and do not reach the level of competence of their follow-up generation. Communication via new technology is one such area; DIs prefer to use e-mail for online communication, whereas DNs prefer the more synchronous forms of instant messaging through social media platforms. Regarding phones, DIs favor speaking directly to people, whereas DNs prefer speed texting (Taipale, 2016; Vodanovich et al., 2010). While Prensky (2001) does not provide an unequivocal criterion for the classification of individuals into generational groups, most of the following publications suggest an age limit of 1980 as a year of birth as the differentiation, assuming that from this point onwards, digital technology was so widespread that all those born later were raised in a digital world (Palfrey & Gasser, 2008). We followed this assumption. Prensky's (2001) approach has been taken up frequently in the context of consumer acceptance of technology. Based on the TAM, Rasalingam et al. (2014) identified, for instance, that DNs have a higher acceptance towards online shopping than older customers. Furthermore, Metallo and Agrifoglio (2015) revealed acceptance disparities between the generations in the usage of social media platforms. In addition, Hoffmann et al. (2014) could demonstrate sig-

nificant differences between DNs and DIs considering consumer trust in online services. The moderating effect of age was investigated in m-payment research and extensively confirmed by Liébana-Cabanillas et al. (2014). The generation-specific differences identified previously in the context of technology acceptance research substantiate the assumption towards generational differences concerning the acceptance of m-payment methods.

4.3.3 Hypotheses

Various acceptance studies in the context of modern technologies show that the intensities of the respective effect relationships vary within the model construct, partly depending on the demographic and behavioral determinants of the user (Wang, Wu, & Wang, 2009; Yousafzai & Yani-de-Soriano, 2011). Factors such as age, sex and technological affinity can intensify or weaken the effect of the determinants on technology acceptance. Therefore, different intensities of influences should be the focus of this generation-specific study. The construct of "perceived usefulness" in the context of m-payment systems refers to an increase in the efficiency and effectiveness of transaction processes in everyday life (Zmijewska, Lawrence, & Steele, 2004). Previous empirical studies have repeatedly shown a positive correlation between the perceived usefulness of m-payment systems and the attitude towards the use or acceptance (Arvidsson, 2014; Chen, 2008; Kim et al., 2010; Mallat, 2007; Meharia, 2012; Schierz et al., 2010). Liébana-Cabanillas et al. (2014) point out that the strength of this effect varies depending on the age of the consumers. In their study on user acceptance against text message payments, they compared two age groups, with a division at 35 years. According to their study, the influence of perceived usefulness on attitude towards using m-payment systems among younger consumers is more pronounced (Liébana-Cabanillas et al., 2014). This result is supported by Yousafzai and Yani-de-Soriano (2011). They show that the relationship between the perceived usefulness and the acceptance of online banking services is most pronounced in younger consumers, who are characterized by optimism and enthusiasm compared to other consumer groups (Yousafzai & Yani-de-Soriano, 2011). Hoffmann et al. (2014) reveal that the DIs focus less on the benefits of new technologies than on the uncertainty about the unknown procedures in the context of online services. The potential effort to learn how to deal with it also tends to be a barrier for them (Hoffmann et al., 2014). Thus, it is assumed for the investigation

context of m-payment methods that:

H1: The impact of perceived usefulness on the attitude towards using mobile payment services is higher among the Digital Natives.

In view of the low spread of m-payment systems in Germany, the consumers have hardly any user experience. Consequently, their perception of ease of use is merely a subjective assessment of the potential effort that would be needed to understand or use these applications respectively (Gilaninia, Delafrooz, & Machiani, 2012). The perceived ease of use in m-payments is mainly due to the number of implementation steps, the duration of the payment process and the complexity of the registration process at the provider (Wiedemann, Goeke, & Pousttchi, 2008). A simple implementation is central to the consumer's willingness to use, particularly in daily, purely utilitarian practices, such as in the case of payment transactions (Nysveen, Pedersen, & Thorbjørnsen, 2005). Consequently, a positive influence of this factor could also be demonstrated for m-payment (Arvidsson, 2014; Dahlberg & Öörni, 2007; Keramati et al., 2012; Kim et al., 2010; Mallat, 2007; Meharia, 2012). Various research papers postulate that the importance of the user-friendliness of technological systems for attitude and acceptance varies according to age (Czaja et al., 2006; Niehaves & Plattfaut, 2014). Thus, Morris and Venkantesh (2000) show in the entrepreneurial context, that the ease of use of older employees has a greater impact on the usability of new technologies in the workplace than on younger employees. This factor includes both the perceived control over the system and the ease of use (Morris & Venkatesh, 2000). Wang et al. (2009) proved similar results in their study on the acceptance of mobile learning (M-learning) systems. They compared two age groups, with the age of 30 being chosen as a separation limit. Their analysis showed that the negative effect of the expectation on the effort of using the system on the intended use of the older group is stronger (Wang et al., 2009). In addition to this, a number of studies have shown that a suited, intuitive control of technology systems is one of the most important acceptance drivers from the perspective of elderly consumers (Chin, Fu, & Kannampallil, 2009; Mallenius, Rossi, & Tuunainen, 2007). These results align with the stereotypical characteristics of the DNs and DIs, as elderly users are attributed with certain usability and acceptance difficulties towards new technologies. The DNs, on the other hand, have greater self-efficacy in terms of usage regarding the application of modern

technologies (Helsper & Eynon, 2009; Kirk, Chiagouris, Lala, & Thomas, 2015). Consequently, we assumed that the ease of use of technology systems is an essential aid for older people and is, therefore, of higher relevance to them. Thus, the following hypothesis should be assumed in the context of m-payment systems:

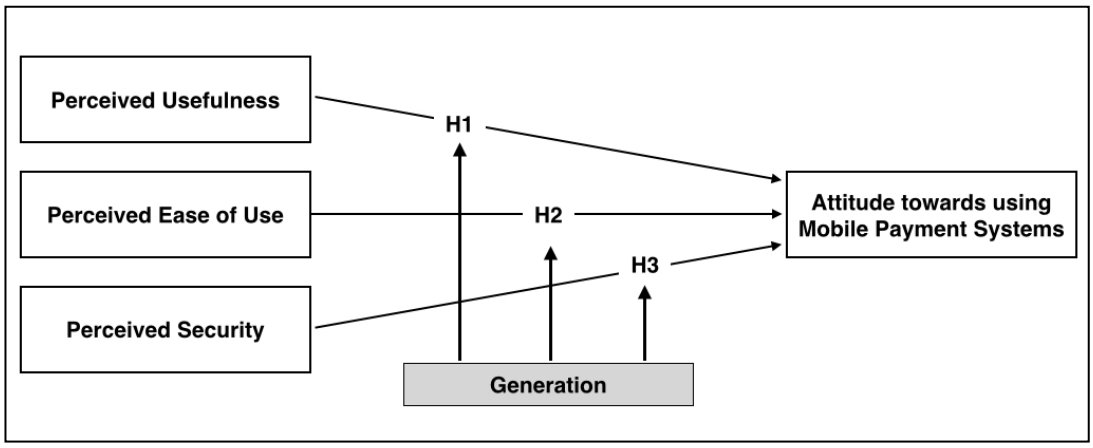
H2: The impact of perceived ease of use on the attitude towards using mobile payment systems is higher among the Digital Immigrants.

While the usefulness and ease of use in each case determine the attitude towards m-payment systems positively, the use of such methods always entails inhibitory risks. This is especially true in the field of innovative payment systems, which confront consumers with a new situation where they perceive security risks in particular (Kim, Tao, Shin, & Kim, 2010; Linck, Pousttchi, & Wiedemann, 2006). This is due to the fact that the consequences of the use are usually difficult to calculate. Thus, it is only an estimation of the possible dangers by the customers, therefore, a subjectively perceived risk (Mitchell, 1999). Concerning payment systems, the rise of abuse is the focus of consumerism (Cimiotti & Merschen, 2014; Levente & Sandor, 2016). According to a representative study conducted by PwC (2016), 85 percent of German citizens consider this method of payment risky, because data could be hacked and abused by technological manipulation by third parties. An equal share sees a risk in the smartphone being stolen and used for m-payments to the actual owner's detriment (PwC, 2016). Consumers also see an operational risk in the technical systems involved in the payment process, as they could fail during the transaction process and, thus, prevent data exchange (Bernet, 2014). Experts agree that security risks are the main reason for the low level of usability (EBS Business School, 2012; PwC, 2016). Thus, Bernet (2014) and Khodawandi et al. (2003) identified the perceived risk or the subjective uncertainty, respectively, as the most important acceptance barrier for m-payment systems. Schierz et al. (2010) also demonstrate a highly significant influence of the risk factor on the consumer's intention of use - both for those who had already made m-payments and for those without experience. However, there are indications that the risk assessment diverges in a generation-specific way from m-payment systems. In line with the widespread assumption that DIs are more skeptical about new technology systems than the younger generation, a study by Bitkom (2011) showed that elderly people place greater importance on data protection on the Internet than younger ones: Users aged between 50 and 64 years showed the greatest concerns. On the other hand, younger

users in social networks and other online platforms are much more likely to display personal information, such as images or status messages, although they are aware of the risks, such as data abuse (Bitkom, 2011). This insight is accompanied by scientific studies of acceptance research. Nyeko et al. (2014) found in the context of mobile banking procedures that the positive impact of the perceived security on the use of the procedures is more pronounced with the increasing age of users. The safety aspect is, therefore, of greater importance for older consumers in terms of acceptance than for younger consumers (Nyeko et al., 2014). This can be due to the fact, among other things, that the general risk profile of people decreases over the course of a lifetime (Josef et al., 2016). Consequently, it is assumed for the perceived security of m-payment procedures that:

H3: The impact of perceived security on the attitude towards using mobile payment systems is higher among the Digital Immigrants.

Figure 1. Research Model.



4.4 Research Design and Method

4.4.1 Empirical Design

A linear regression analysis was conducted to prove the hypotheses developed. This method makes it possible to reproduce the stochastic causal relationship between metric variables quantitatively. In relation to the present study, the expression of the dependent variable y ("attitude") is predicted based on the independent variables xn ("perceived usefulness," "perceived user-friendliness" or "perceived risk"), which means that their interdependency is quantified. Based on the data observed for the

variables xn and y, a linear regression equation can be determined which best represents the overall trend of the data (Rasch, Friese, Hofmann, & Naumann, 2014). In a first step, the independent constructs of the research model were viewed collectively to analyze the overall explanatory power. After that, we subjected the individual parameters to test their singular effect separately. Respectively, individual regression models were constructed, where each contain only one independent variable. In view of the research object, this approach can create graphs with regression lines for each variable, which, in turn, allows a visual analysis of the interdependencies, including generation-specific differences. As can be seen, we expected the generation to be a moderator. A moderator is, in this case, a qualitative dichotomous (age group) variable that affects the relationship between the continuous predictor variables (independent variable) and the criterion variable (dependent variable) (Baron & Kenny, 1986; Hayes, 2013). Therefore, we applied a moderated regression (Aiken & West, 1991). This method is generally used to check how the interrelationships between variables are affected by another independent variable (the moderator variable M). The moderator variable can influence the strength, significance or direction of the effect relationship (Urban & Mayerl, 2008). Hence, the statistical analysis has to measure the differential effect of the independent on the dependent variable as a function of the moderator (Baron & Kenny, 1986). The affiliation to the generation of the DNs or DIs describes the moderator variable, whereby only the differences in the intensity of the respective effect relationship are of interest here. To investigate this relationship, each independent variable was initially centered to minimize multicollinearity (Aiken & West, 1991). Then, M was characterized in terms of interactions which were integrated into the regression models formed previously (Cohen & Cohen, 2003). Our interaction terms are a multiplicative link between the respective independent variable and the affiliation to a generation (Aiken & West, 1991). Due to the present dichotomous shape of the moderator variable, generational affiliation was operationalized using a 0/1 dummy variable. Thus, the term describes the variations of the slopes in the regression lines between the generations (Cohen & Cohen, 2003). A moderator effect occurs when the interaction term results significantly in the regression analysis (Hayes, 2013). In this case, the effect differs between the independent variable and the dependent variable reliant on the state of M (dummy variable). The impact of the moderator effect can be determined by the change in the amount of variance explained in the dependent variable (ΔR^2) (Aiken & West, 1991; Cohen & Cohen, 2003; Hayes,

2013).

4.4.2 Structure of the Survey

The results are based on a quantitative online survey. We focused on the general attitude towards m-payments at the stationary POS (dependent variable) and the subjective assessment of "perceived usefulness," "ease of use" and "security" of the systems (independent variables). Furthermore, we tested the importance of the independent factors mentioned above as control variables. The importance of social acceptance was measured to gain further insight into generation-specific differences. Due to the low popularity of the m-payment systems, we gave a description of a typical m-payment process in the stationary POS at the beginning of the survey. The aim was to provide the subjects with a realistic idea of the procedure. We tried to avoid confusion with other innovative means of payment and brought all probands to a comparable level of knowledge about the subject under investigation. After testing the constructs of the model, we finally requested the sociodemographic data to be able to classify the probands according to generations.

4.4.3 Data Collection and Sample

The study took place from April 2 to 30, 2016, and was posted mainly on social media, such as "Facebook" and the career network "Xing." Since we expected predominantly to reach younger people with chosen social media platforms, we also used e-mail lists of various companies and social clubs to recruit our participants. The participation in the questionnaire was voluntary and no incentives were used. As mentioned already, the survey was conducted using an online questionnaire, which was subjected to a pretest prior to implementation. For the pretest, survey data were collected from a sampling of 50 respondents. The results helped to avoid uncertainties concerning the validity of the constructs. The population analyzed was characterized by all German inhabitants who can use mobile devices. At the end of the survey period, 312 persons participated in the survey in total, but only 262 datasets were useable. A total of 59.16 percent of the 16- to 71-year-old participants were female and 40.84 percent were male. The average age was $M_{age} = 32$. The sample was segmented according to age into the group of DNs (born after 1980) and DIs (born before and in 1980). There were 176 DNs and 86 DIs. The average age of the DNs is $M_{age} = 26$ and of the DIs is M_{age}

= 51. Eight DNs and two DIs had already made an m-payment at the POS.

4.4.4 Operationalization

As already described, the TAM forms the theoretical basis for our investigation. Therefore, all variables used could verify their goodness of fit in a couple of studies mention below. Above, we exhibited the values of Cronbach's alpha (α) for each variable. We used the personal attitude towards m-payment as the dependent variable (Davis, 1989). This factor is often employed to measure the general acceptance of technology and particularly adoption of m-payment systems. Thus, we applied the following scale to measure the attitude: "I think using mobile payment services is a good idea," "I think using mobile payment services is wise," "I think using mobile payment systems is beneficial" and "I think using mobile payment services is interesting" (α = .94) (Oh, Ahn, & Kim, 2003; van der Heijden, 2003; Yang & Yoo, 2004). The independent variable "perceived usefulness" explains the degree to which a consumer is convinced about the added value of an innovation: "Mobile payment services are a useful mode of payment," "Using mobile payment services makes the handling of payment easier" and "By using mobile payment services, my choices as a consumer are improved (e.g., flexibility, speed, etc.)" (α = .89) (Bhattacherjee, 2001; Devaraj, Fan, & Kohli, 2002; Koufaris, 2002; van der Heijden, 2003). Additionally, "ease of use" is a basic element of the TAM and measures the person's perception of how much effort is required to handle a new technology: "I think it is easy to become skillful at using mobile payment services," "I think the interaction with mobile payment services is clear and understandable," "I think it is easy to perform the steps required to use mobile payment services" and "I think it is easy to interact with mobile payment services" (α = .95) (Bhattacherjee, 2001; Davis, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000). Thirdly, we tested the independent variable "perceived security." The factor focuses on the degree of security a person perceived when using m-payment services. Thereby, the abuse of transaction data was of special interest: "The risk of an unauthorized third party overseeing the payment process is low," "The risk of abuse of usage information (e.g., names of business partners, payment amount) is low when using mobile payment services," "The risk of abuse of billing information (e.g., credit card number, bank account data) is low when using mobile payment services" and "I would find mobile payment services secure in conducting my payment transactions" (α = .95) (Luarn &

Lin, 2005; Parasuraman, Zeithaml, & Malhotra, 2005). All items were measured on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree), because this scale has been shown to reach the upper limits of the scale's reliability (Allen & Seaman, 2007; Nunnally, 1978) and is also used in most of the reference papers (Bhattacherjee, 2001; Schierz et al., 2010; Venkatesh & Davis, 2000).

4.5 Results

4.5.1 Hypotheses Test

We tested all constructs of our framework through an independent sample t-test in a first step of the data analysis. Therefore, we investigated potential differences between the generations in the extent of "perceived usefulness" (PU), "perceived ease of use" (PEU), "perceived security" (PS) and "attitude towards using m-payment services" (ATT). The aim of conducting the t-test was to get a first hint about possible interdependency among the variables mentioned that builds a basis for following regression analyses. We found that the mean values of both groups differ significantly from each other across all constructs ($p < .001$). Thereby, the younger generation (DNs) assessed m-payment to be more useful, easier to use and safer compared to the older generation (DIs). As expected, the overall attitude towards mobile payment services is much more positive in the group of DNs. The factor of PEU achieved the highest values in both generation groups ($M_{DNs} = 4.92$ and $M_{DIs} = 4.10$). Therefore, the process of paying with the mobile phone was generally accessed to be simple and easy to learn. Mobile payment was also evaluated as very useful for the DNs ($M = 4.35$), but noticeably lower for DIs ($M = 3.29$) ($t = 4.752$, $df = 260$, $p < 0.001$). The low trust in the security of this payment system was conspicuous ($M_{DNs} = 2.70$ and $M_{DIs} = 1.94$). This result aligns with former research which could also find a significant influence of security and risk aspects on m-payment evolution (Arvidsson, 2014; Kim et al., 2010). We detected the biggest difference between the two groups in the construct of attitude towards using m-payment services. While the DNs had a positive attitude concerning this payment method ($M = 4.23$), the DIs clearly refused it ($M = 2.91$) ($t = 5.956$; $df = 260$; $p < .001$). This finding corresponds to the stereotypical characteristics of the generations observed and the results of Liébana-Cabanillas et al. (2014) concerning age-

specific differences in accepting m-payment systems. Before focusing on the hypothesis, a simple linear regression was calculated to examine whether the variables mentioned predicted attitude towards using m-payment services. A significant regression equation was found ($F(3,258) = 243.997$, $p < 001$) (Adjusted $R^2 = .736$). Regression analysis projected that PU predicted attitude most strongly ($\beta = .589$, $p < .001$), while PEU ($\beta = .199$, $p < .001$) and PS ($\beta = .251$, $p < .001$) also predicted the attitude significantly. At this point, however, it is not yet clear whether the influence of the variables on the attitude differs significantly from each other between the generations and how strongly these differences should be assessed. Consequently, we used a moderated regression analysis (Aiken and West, 1991) to examine whether generation-specific differences affect the attitude towards m-payment in various intensities. H1 illustrates the relationship between perceived usefulness and the attitude towards using m-payment services. The influence of PU on ATT was expected to be higher in the group of DNs. A significant regression equation was found for both groups (DI: $F(3,82) = 71.148$, $p < .001$, adjusted $R^2 = .712$; DN: $F(3,172) = 139.330$, $p < .001$, adjusted $R^2 = .703$). The individual regression analysis for each factor explained that PU (DN: $\beta = .800$; $p < .001$ and DI: $\beta = .768$; $p < .001$) predicted the attitude with a high significance. To examine H1, we had to integrate an interaction term as the product of the centered independent variable PU and the dummy variable DN into the regression model. By doing this, we proved a significant difference between the moderating influences of the generation. Through the addition of this term, no significant increment on the amount of variance explained in ATT could be found ($\Delta R^2 = .00$, $p > .10$), indicating that generation affiliation does not moderate the PU – ATT relationship. Therefore, H1 could not be confirmed.

Table 1. Results of hierarchical regression analysis: Moderating effect of generation on PU – ATT relationship (* p < .1; ** p < .05; *** p < .01).

Predictors	Model 1 β	Model 2 β
Perceived Usefulness (PU)	.771***	.765***
Generation Group (Dummy/DN)	-.128***	-.120
PU * Dummy/DN		-.012
R^2	.665***	.664***
ΔR^2		.001

The connection between PEU and the ATT was investigated in H2. Similar to the results above, a significant and positive relationship between these two variables could

be found (DN: $\beta = .541$; $p < .001$ and DI: $\beta = .622$; $p < .001$) for both groups. However, H2 posited a greater influence of PEU on ATT in the group of DIs. Again, an interaction term as the product of the centered independent variable PEU and the dummy variable DI was integrated into the regression model. Through the addition of this term, no significant increment on the amount of variance explained in ATT could be found ($\Delta R^2 = .001$, $p > .10$), indicating that generation affiliation does not moderate the PEU – ATT relationship. Therefore, we found no important differences in the increase of the two regression lines. Thus, H2 could not be confirmed either.

Table 2. Results of hierarchical regression analysis: Moderating effect of generation on PEU – ATT relationship (* $p < .1$; ** $p < .05$; *** $p < .01$).

Predictors	Model 1 β	Model 2 β
Perceived Ease of Use (PEU)	.550***	.575***
Generation Group (Dummy/DI)	.222***	.155
PEU * Dummy/DI		.071
R^2	.402***	.400***
ΔR^2		.002

It was assumed in H3 that the influence of the PS on the ATT is higher in the group of DIs than in the group of DNs. As expected, we also found a positive and significant influence of PS on ATT in both groups (DN: $\beta = .507$; $p < .001$ and DI: $\beta = .619$; $p < .001$). The high regression coefficient in the group of DIs compared to the group of DNs is conspicuous. Hence, we expected a significantly higher influence of the security perception on attitude for the older age group. Analogous to the investigation method for H1 and H2, we integrated an interaction term as the product of the centered variable examined PS and the dummy variable DI. As one can see in Table 3, the interaction of security and generation has a significant effect on attitude ($\beta = -.164$; $p < .10$). Through the addition of the interaction term, a significant increment on the amount of variance explained in ATT could be found ($\Delta R^2 = .008$, $p < .10$). We observed that the effect of perceived security on the ATT is significantly higher in the group of DIs than in the group of DNs. Thus, H3 could not be rejected.

Table 3. Results of hierarchical regression analysis: Moderating effect of generation on PS – ATT relationship (* p < .1; ** p < .05; *** p < .01).

Predictors	Model 1 β	Model 2 β
Perceived Security (PS)	.523***	.465***
Generation Group (Dummy/DI)	.221***	.359***
PS * Dummy/DI		-.164*
R^2	.373***	.379***
ΔR^2		.008*

Looking at the results, it can be noted that the constant a, the intercept, is continuously higher in the group of DNs. This leads to the conclusion that the younger generation has a fundamentally more positive attitude towards m-payment than the elderly generation. These findings were also supported through the t-test conducted.

4.5.2 Test of Control Variable

An independent sample t-test was conducted to improve validity. Thereby, we examined generation-specific differences in the importance of our variables to pay in a mobile way at the POS. Concerning the importance of PU, we found significant differences between the generation groups ($M_{DNs} = 5.53$ and $M_{DIs} = 4.45$) ($t = 3.803$, $df = 260$, $p < .000$). Therefore, the usefulness of using m-payment at the POS is more important for the DN than the DI. These findings support the assumption of H1, which postulates a greater influence of this factor on the attitude for DNs. The other control variables showed no significant differences between both groups. Thus, the importance of the factors PEU ($M_{DNs} = 5.63$ and $M_{DIs} = 5.42$) ($t = .816$, $df = 260$, $p = .416$, 2-tailed) and PS ($M_{DNs} = 6.35$ and $M_{DIs} = 6.52$) ($t = -.864$, $df = 260$, $p = .388$, 2-tailed) was assessed approximately equally among the age groups.

Consequently, none of the variables mentioned influences the results in the form of a disturbance variable. The high relevance of the security aspect further illustrated the enormous influence of risk avoidance in the case of financial transactions.

4.6 Discussion

4.6.1 Summary of the Results

Many unsuccessful initiatives of establishing m-payment services in stationary trade

have been detected in the past few years. So far, none of the technological solutions could satisfy consumer needs in a holistic way. One essential, but not commensurate condition for using m-payment systems is the security aspect. There are great security worries among the consumers concerning the NFC technology as Zhou (2014) showed. From the technical perspective, there were some vulnerabilities in data modification and the NFC technology did not protect against listening to communications (Monteiro, Rodrigues, Lloret, & Sendra, 2014). However, the latest research by ISACA (2015) classified the NFC payment method combined with tokenization to be very secure. Providers are encouraged to examine and address consumers with special regard to their preferences and perceived security to ensure complete market Adoption. Against this background of a meanwhile secure technology, this paper aims to empirically investigate the moderating influence of generation-specific differences between DNs and DIs on the effect of the independent variables on the attitudes towards using m-payment systems. The results of the investigation prove that the attitude towards using m-payment systems differs significantly between generations. The younger group consider m-payment procedures to be more useful, user-friendlier and safer than the older group. Furthermore, they are characterized by a more positive attitude towards using this innovative payment technology than the older generation. Surprisingly, the DIs also evaluate m-payment to be easy to use, which was not be expected. These insights, however, strengthen generation-specific stereotypes. Thus, DIs are affine to technology, whilst DIs reflect a certain reserve towards innovative information systems. Additionally, it becomes apparent that DNs weight ease of use and usefulness of mobile payment systems more heavily when deciding whether to use these systems. We observe a great divergence by the safety factor, i.e. the potential loss of sensitive data. Both generation groups evaluate m-payment methods as risky and both see the safety of the system as the most important criterion for the decision to use this payment innovation. However, the investigation focuses on the analysis of effects resulting from the constructs used on the attitude component considering the age groups as a moderator. The regression analysis reveals that the three acceptance factors chosen, influence the attitude strongly in a positive manner. The higher the perceived usefulness, ease of use and security standards of m-payment services are assessed by consumers, the more positive the attitude towards those payment systems develops. The results verify that the negative influence of perceived security and risk has a significantly stronger effect on the attitude of DIs than on DNs. Potential safety risks are,

thus, shown to be linked to greater consequences for older consumers than for younger ones. One reason for this finding could be the increasing risk aversion of people over their lifetimes (Josef et al., 2016). This effect could be observed especially for sensitive procedures with a huge potential for loss, which is the case for payment transactions (Henkel, 2001). No significant, generation-specific difference regarding the strength of influence on the attitude can be shown for the other constructs. Nonetheless, the continuously higher value of the constant a, the intercept, confirms the higher level of attitude described towards using m-payment systems for the younger generation.

4.6.2 Theoretical and Practical Implications

The examination of the generation concept of DNs and DIs regarding technical aspects of proximity payments widens the scope of current m-payment research and fills one more important research gap. Consequently, the findings extracted allow one to draw relevant theoretical and practical implications.

Thus, we suggest reading prior research of attitudes towards proximity m-payment differentially as a theoretical implication. Reviewing the literature, we analyzed differences concerning the influence factors of m-payment acceptance between different authors. Divergent results of risk and security (Bernet, 2014; Tan et al., 2014) as well as compatibility (Arvidsson, 2014; Kim et al., 2010; Schierz et al., 2010) could be explained by regarding generation-specific characteristics. Hence, these samples should be explored and analyzed considering the generations of DNs and DIs. Moreover, the detailed description of both generations allows a more precise investigation of relevant influence factors on the attitude and acceptance of m-payment. These findings can consequently be transferred to other technological research areas to get more valid insights into consumer behavior. Based on the differentiated view of DNs and DIs, we also propose first practical recommendations and strategic actions to reduce the rejection by various stakeholders. We derive two possible strategies for market penetration, including information about the target group-specific design of the mobile application and the marketing communication channel and content. As a first strategy, we suggest focusing on the segment of DIs. Our study shows that the factor “perceived security” is decisive for the attitude of both generations. Elderly consumers particularly consider m-payment systems as risky and, hence, are influenced more strongly in their attitudes. Therefore, it is unavoidable for providers to not only design systems with high safety

standards, but also to communicate the security of these systems in the marketing approach towards older consumers. Furthermore, our study results derive that the level of "perceived usefulness" and "perceived ease of use" is evaluated lower by DIs. However, Gurtner et al. (2014) emphasize the importance of ease of use in the group of best and middle agers. We can totally agree with the authors' recommendation not to facilitate the mobile application, since usefulness is also decisive, but to simplify the access through educational concepts or special tutorials (Gurtner et al., 2014). The benefits of easy and secure payment transactions should be communicated through target group-specific treatment of DIs. This would lead to an assimilation of the fundamental attitude of this generation to the younger generation. Holt et al. (2013) confirm their hypothesis of elderly citizens using traditional news media, such as television, radio and newspapers, more frequently than DNs. Thus, we recommend using traditional channels for the advertising approach. A further strategic approach of market launch aims to address especially younger consumer groups in the early stage. The results depict that their acceptance towards m-payment is more distinctive from scratch. If this consumer group could be convinced to use innovative payment methods more often, elderly segments could be reached due to effects triggered by the critical mass. Younger users could serve as so-called "early adopters", which can encourage the diffusion of m-payment systems to the older and rather reserved consumer groups by word of mouth (Bass, 1969, 2004). This Adoption process has been recognized for technological innovations several times in the past, for example, for the market diffusion of smartphones (Lee, 2014). Regarding the design of ubiquitous information systems, multiple functionality is one of the most important components (Tilvawala et al., 2011). Additionally, Gurtner et al. (2014) detected convenience to be the dominant influencing factor for DNs regarding mobile business applications. Transferred to m-payment, the applications should be designed in a multifunctional and convenient manner and serve as a mobile wallet. According to the research of Helsper and Eynon (2009), we propose that companies should use the internet as their prior marketing communication channel to reach the DNs. Our results also identified a low level of security in the group of DIs. As security impacts the attitude towards m-payment, the current secure payment technology could be communicated (ISACA, 2015). Finally, the diverse actors in m-payment systems are challenged to identify the acceptance tendency of consumer groups and react accordingly.

4.6.3 Limitations and Further Research

Although the results of the experimental design have provided clear insights, some restrictions must be made. On the one hand, the model-theoretic construct is intentionally limited to technical aspects. In its original design, the TAM comprises a further variable being dependent on the attitude, the behavioral intention, which determines the actual system use. The investigation of this relationship has been disregarded deliberately, because no indications of generation-specific differences for this context could be detected. Restricting the different volumes of control groups used for the moderator analysis and a slight imbalance of gender relations in the group of DIs should be mentioned. Additional research requirements can be seen in an extension of the model by further constructs which are suitable for this specific approach of investigation. In the context of mobile bank services, for instance, Yu (2012) could identify the factor "social norm" as the strongest acceptance driver, and that its strength of influence is moderated positively by age. Furthermore, this article is based on the original generation thesis postulated by Prensky (2001). This dichotomous perspective is partially criticized by literature, because the classification of year of birth is not authentic to the complexity of existing generation groups, particularly in times of continuous technological change (Jones & Czerniewicz, 2010; Wang, Myers, & Sundaram, 2013). Jandura and Karnowski (2015), therefore, suggest linking the distinction of generation to a combination of attributes: "age" and "use of internet" (Jandura & Karnowski, 2015). Hoffmann et al. (2014) postulate a more detailed distinction of generation groups by an additional group of middle-aged people ("Naturalized Digitals"). Besides the consideration of additional distinction, features can lead to a more differentiated analysis of preferences concerning the target groups and to specific guidelines.

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5 Research Paper 4: Paying Mobile at the Point of Sale – A Question of Culture?

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Abstract: Contrary to the USA, the breakthrough of mobile payment (MP) in Germany has not yet been realized. Based on an extended technology acceptance model (TAM), we therefore analyzed the moderating effects of Hofstede's cultural dimensions on technological, social, and trust-related aspects influencing the behavioral intention towards using MP. We identified that the impact of social influence on the intention to use MP is stronger affecting German inhabitants. Except for this, culture could not be detected as a moderator within our study. Nevertheless, we identified that the trust in MP, the perceived usefulness, as well as the social influence have the strongest impact on the intention to use in both countries. The results reinforce the importance of emphasizing the trustworthiness of the systems and contribute to MP research across countries.

5.1 Introduction

The mobile phone has become indispensable for modern digital society, as it has developed from a communication tool to a multifunctional device, which even allows customers to pay directly at the point of sale (Slade, Dwivedi, Piercy, & Williams, 2015). Recognizing the enormous data-creating potential of mobile payment (MP) solutions, different providers - such as banks, mobile providers and technology companies - have developed their own payment services (Dahlberg & Öörni, 2007). As a result, a diverse landscape of MP systems has arisen in the USA and Germany.

Investigating the adoption of MP systems, researchers have to consider the underlying technology (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008). Accordingly, MP can be divided into remote and proximity payments (Slade, Williams, & Dwivedi, 2013). Remote payments include mobile banking and mobile internet payment services and require a connection to a remote payment server, similar to e-commerce payment systems (Slade et al., 2013; Zhou, 2013). However, the present investigation focuses on payment processes at the stationary point of sale ("Proximity Mobile Payment"). This subcategory is characterized by the physical presence of the customer and a physical infrastructure in trade (Slade et al., 2015; Smart Card Alliance, 2007). Regarding the transfer of data, the near field communication (NFC)-technology is the most promising system for proximity MP (Neßler, Lis, & Fischer, 2016), allowing service providers to store customer preferences and to offer personalized proposals to customers such as coupons or discounts (Ondrus & Pigneur, 2009). Thus, most of the big players such as Apple, Google and Samsung are focusing on NFC for their payment solution (Adams, 2015; International Business Times, 2014; Kharif, 2011). Contrary to the expectation, the breakthrough of MP in Germany has not yet been realized as only 0.4 percent of the population assessed MP to be their favorite payment method (Splendid Research, 2018) and 43 percent of the Germans so far cannot even imagine paying mobile (Statista, 2019). Whereas in the USA, this payment type is growing in popularity. Proximity MP is being used by 64 million customers already (eMarketer, 2019). The latest developments in Germany concerning MP offerings by Google and Apple require MP providers to understand the drivers of consumers' acceptance of this technology. The identification of key drivers for the diffusion of MP enables these companies to modify their development and marketing strategies to meet consumers' needs (Schierz, Schilke, & Wirtz, 2010) and to implement their service solutions successfully.

Consequently, many researchers focused on consumers' MP acceptance factors and analyzed their impacts on the intention to use such services (e.g. Mallat, 2007; Thakur, 2013; Yang, Lu, Gupta, Cao, & Zhang, 2012). The preferred theoretical frameworks used to examine the MP usage intention are TAM based research models (Mondego & Gide, 2018). Besides the basic elements of TAM, which focus on the technological perspective, trust-related and social aspects were identified to play an important role in the context of MP adoption (e.g. Dahlberg & Öörni, 2007; Liébana-Cabanillas, Munoz-Leiva, & Sánchez-Fernández, 2014). While cultural investigations in the domain of technological acceptance are quite common (Cardon, 2008), surprisingly only few researchers have addressed the issue of cultural differences concerning the behavioral intention to use MP. One example is Alshare and Mousa (2014), who examined the moderating role of Hofstede's cultural dimensions on the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) in Qatar.

Based on previous MP research and encouraged by Dahlberg, Guo and Ondrus (2015), who proposed a deeper analysis of cultural effects, we analyzed transatlantic differences between two highly developed western countries regarding the behavioral intention to use MP. In order to do so, the most important factors influencing MP usage intention were identified by adhering to the nomological structure of TAM and adjusting the model for the context MP. Although Germany and the USA seem to be comparable regarding their cultural background, they differ under consideration of Hofstede's (2001) cultural dimensions of individualism vs. collectivism, uncertainty avoidance and long vs. short-term orientation. Thus, we recognized a research gap by investigating the question of whether cultural differences between Germany and the USA moderate the influences of technological, trust-related and social factors on the behavioral intention towards using MP. To assess the cultural differences and to examine the moderating effects, Hofstede's cultural dimensions were used as theoretical background.

According to Ondrus, Lyytinen and Pigneur (2009), understanding cultural factors regarding MP acceptance is of great importance because successful MP business models cannot directly be transferred to different cultural contexts due to the differing market constraints in terms of the mentioned influencing factors. Consequently, our research

aim and motivation were to widen the scope of current research by analyzing one established and one developing market regarding MP diffusion. A comparison of these two countries helps to deepen the understanding of MP adoption and diffusion processes and to improve systems for the largest possible number of customers. To successfully implement and establish MP solutions in different cultures, in-depth knowledge about those processes are relevant for a target group-oriented marketing strategy of MP providers. As the moderating role of culture has been scarcely investigated in the domain of MP but actively encouraged by researchers, such as Dahlberg et al. (2015), the integration of Hofstede's cultural dimension into our research model extends the current state of research. To the best of knowledge, this is the first approach of comparing two highly developed western countries concerning MP adoption, which allows gaining a deeper understanding of prior research.

The results of our investigation prove that the intention to use MP systems differs significantly between Germany and the USA. Only Hofstede's cultural dimension of individualism vs. collectivism were found to moderate the effects between social influence and the behavior intention to use MP. That does not necessarily mean that cultural differences do not further affect the relationship between the selected variables and the intention to use proximity MP. Instead, the mere distinction based on Hofstede's cultural dimensions could be too unidimensional. Thus, this research contributes to the discussion about and the suitability of using Hofstede's dimensions without collecting own cultural data and widens the scope of current research. We also suggest practical recommendations by recognizing influencing factors for the purposeful control of MP implementation strategies. Hence, providers in Germany and the USA have to focus on the usefulness of the applications and take care of the effects of social influence and the trust aspect while promoting an MP system.

The remainder of the paper is organized as follows. First, we review literature related to current MP and cross-cultural investigation. Afterwards, we clarify the theoretical background of the used research model and develop the hypotheses to be tested. The following section addresses the research design and results of the conducted study. Finally, the findings are discussed and theoretical as well as practical implications are derived. Additionally, we outline the limitations and make suggestions for further research.

5.2 Current Research

A multitude of studies have used the Technology Acceptance Model (TAM) (Davis, 1989), the diffusion of innovation (DOI) (Rogers, 2003), as well as the UTAUT (Venkatesh et al., 2003) as a theoretical basis to explain MP adoption (Dahlberg et al., 2008; Dahlberg et al., 2015). Various researchers saw the necessity to expand these models to explain the adoption of MP in an appropriate way.

Therefore, Dahlberg, Mallat and Öörni (2003) enhanced the TAM model with the aspect of trust. The significant influence of trust was later confirmed by Dahlberg and Öörni (2007) and other researchers in the domain of MP (e.g. Liébana-Cabanillas et al., 2014; Lu, Yang, Chau, & Cao, 2011). Especially within a financial context, trust and security issues play a vital role. In order to increase the variance explained of the attitude towards MP adoption, Arvidsson (2014) integrated trust in actors and perceived security into their research model. Both aspects were found to be significant and not correlated, showing that these two variables specify two separate dimensions. These results are also in line with the theoretical study of Mallat (2007), whose research is based on the DOI and included trust, payment system security and a variety of factors concerning the MP technology. Together with perceived security, researchers often examined the variables social influence or subjective norm in the context of MP (e.g. Schierz et al., 2010; Yang et al., 2012). Yang et al. (2012) investigated the impact of social influence and thereby distinguished between the two groups of "potential adopters" and "current users". For both groups, they found significant effects of social influence on "behavioral intention to adopt" or "behavioral intention to continue using" (Yang et al., 2012, p. 135f.). Besides social influence, innovativeness significantly impacts the intention to use MP (Oliveira, Thomas, Baptista, & Campos, 2016; Slade et al., 2015; Thakur & Srivastava, 2014). Guhr, Loi, Wiegard and Breitner (2013) detected that innovativeness, as part of technology readiness, influences the intention to use MP. Furthermore, they recognized differences in the relationship between technology readiness and the intention to use MP among various countries.

However, leading researchers in the field of MP claim that these factors have been comprehensively investigated and do only provide few new insights (e.g. Dahlberg et al., 2008; Dahlberg et al., 2015). The latter strongly encourage further adoption researchers to conduct studies across several countries, as previous work has been limited to one financial ecosystem and one culture only. As national culture was found to

play a key role in technology adoption (e.g. Lee, Trimi, & Kim, 2013) Alshare and Mousa (2014) identified the lack of research in the field of MP and investigated the moderating effect of espoused cultural dimensions on consumer's intention to use mobile payment devices. They concluded that cultural aspects, adapted from Hofstede's (2001) cultural dimensions, moderate the factors of UTAUT in Qatar. Cross-cultural studies were conducted by Pavlou and Chai (2002) in the context of e-commerce, by Mortimer, Neale, Hasan, and Dunphy (2015) in the domain of mobile banking and by Singh (2006) concerning the general adoption of innovations. Pavlou and Chai (2002) used Hofstede's (2001) dimensions long-term orientation, power distance and individualism to examine their moderating impact on the factors given by the Theory of Planned Behavior and found significant results for the USA and China. Mortimer et al. (2015) did not use the dimension of long-term orientation but instead added uncertainty avoidance and masculinity to investigate differences in the intention to use mobile banking. They found differences between Australian and Thai consumers and identified national culture as key antecedent and moderator influencing the adoption of mobile banking. Furthermore, Singh (2006) showed moderating effects of culture on the propensity to adopt innovations in France and Germany. Additionally, Lee et al. (2013) investigated the impact of cultural differences on mobile phone adoption between the USA and South Korea. The authors used longitudinal data from the entire population of mobile phone subscribers in both countries to confirm their hypothesis concerning a higher "innovation effect" in the USA.

With the above-mentioned cultural studies and findings in mind, this begs the question about the influence regarding cultural dimensions on the variables affecting the intention to use MP. As multi-country studies are explicitly encouraged by Dahlberg et al. (2015), our study aims to contribute and widen the scope of current research by investigating moderating effects of Hofstede's (2001) cultural dimensions on the effects of our research model, which we based on the TAM of Davis (1989). To the best of our knowledge, our study is the first one comparing two high developed western countries concerning their acceptance of MP.

5.3 Theoretical Framework and Hypotheses

5.3.1 Cultural Approach

Our research model is based on a wide range of MP investigations. We integrated chosen differentiating characteristics into the consumer behavior model in order to better comprehend the behavior intention to use MP between selected cultures. In the literature, no commonly accepted definition of "culture" has been established yet. Taras, Rowney and Steel (2009) recognized that culture is generally agreed on as a complex-multi-level construct, shared among individuals belonging to a society which is formed over a long period. Another approach is given by Hofstede, who defined culture "as the collective programming of the mind that distinguishes the members of one group or category of people from another" (Hofstede 2001, p. 9). The influence of Hofstede's (1980) "Culture's Consequences" is ubiquitous as most management studies contain at least some dimensions linked to one of his defined cultural dimensions to examine cross-cultural investigations (Nakata & Sivakumar, 2001; Taras et al., 2009). He clustered the cultural construct into five bipolar dimensions, which became the foundation of his characterizations of culture for each country (d'Iribarne, 1996; Lee et al., 2013). To ensure the validity of the results, we only used the dimensions in which the analyzed nations clearly differ (individualism vs. collectivism; uncertainty avoidance; long vs. short-term orientation). A further sixth dimension (indulgence vs. restraint) can be considered as complementary to long vs. short-term orientation (Hofstede, 2011) and was not discussed separately. Table 1 presents the definitions for the selected cultural dimensions together with the values (scale: 0-100) for Germany and the USA (Hofstede Insights, 2019).

Table 1. Cultural Dimensions.

Cultural Dimension	Values		Definition
	USA	Germany	
Individualism	91	67	Individualism, the high side of this dimension, defines a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Collectivism in opposite to Individualism represents a preference for a tightly-knit framework in society in which individuals look after their relatives or members of a specific in-group in exchange for unquestioning loyalty.
Uncertainty Avoidance	46	65	Uncertainty avoidance defines the degree to which members of a society feel objectionable with uncertainty and ambiguity. A strong degree of UAI means the society values rigid codes of belief and behavior and are illiberal of unconventional behavior and ideas. Societies who score low in UAI have a more relaxed attitude and value practice more than principles.
Long Term Orientation	26	83	Long term orientation describes the degree to which a society maintains links with its own past while dealing with the challenges of the present and the future. A low score of long-term orientation means the society maintains traditions and norms and is suspicious about societal change. A society with a high score in this dimension takes a more pragmatic approach. They prepare for the future by encouraging thrift and efforts in modern education.

Studies predominantly use his national cultural dimensions to gather the cultural characteristics at the level of national markets (Chen, Ng, & Rao, 2005; Deleersnyder, Dekimpe, Steenkamp, & Leeflang, 2009). Current research verifies that consumers' acceptance of products is higher when the cultural content of the product matches their own cultural peculiarity (Lee, 2006; Craig, Green, & Douglas, 2005). As the market of financial transaction is heavily influenced by a cultural background, understanding cultural differences is essential for managing services such as MP solutions. For this purpose, Hofstede's theoretical framework obtained strong empirical support (Sondergaard, 1994) and is the most common and suitable approach to investigate cross-cultural differences in the domain of technological and information systems research (Dinev, Goo, Hu, & Nam, 2009; Lee et al., 2013; Taras et al., 2009). Therefore, this study uses his theoretical approach to examine culture as an influencing factor of MP solutions. Within the TAM, numerous investigations used the cultural dimensions as moderating factors (e.g. Straub, Keil, & Brenner, 1997; Zakour, 2004). Guhr et al. (2013) mentioned Hofstede's dimensions in their TAM based MP research without

analyzing and explaining a moderating effect of culture. Therefore, we used Hofstede's descriptions of national cultures to examine a moderation between the independent variables and the intention to use MP services.

5.3.2 An Enhanced Technology Acceptance Model

Several studies emphasize that TAM is a parsimonious and robust model of technological acceptance behavior, making it to one of the most used models for explaining customer acceptance in the field of new technologies (e.g. Bouwman, Kommers, & van Deursen, 2014; Lai, 2017) and to investigate the adoption of MP (e.g. Arvidsson, 2014; Dahlberg & Öörni, 2007). Although the theory is useful in explaining behavioral intention, we posit that some extensions need to be made to explain the intention to use MP more appropriately. Based on an extensive literature review and supported by the observation of Mondego and Gide (2018) and Dahlberg et al. (2015), we extend the TAM based research model by the most critical drivers influencing the adoption of MP. This approach is in line with the call for additional research that broadens and deepens TAM by introducing new variables (Bagozzi, 2007).

According to the TAM, two factors, "perceived usefulness (PU)" and "perceived ease of use (EU)" influence the acceptance of new technologies. Perceived usefulness is defined as "the degree, to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Furthermore, Davis understands perceived ease of use as "the degree, to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). In this regard, a technological system with a high value on perceived ease of use is assessed to be more useful. Besides, both variables affect the individual's attitude towards using a technology, which themselves affect the behavioral intention to use (BI) such technology. Lastly, the BI predicts the actual usage (Park, 2009). Considering the expected low attention towards MP in Germany, we had to alter the TAM by focusing on the intention to use MP. As various researches have confirmed the positive relationship between attitude, behavior intention as well as actual usage no additional examination was necessary (e.g. Meharia, 2012; Schierz et al., 2010).

However, to provide relevant marketing information, we have to investigate the behavior intention to use MP appropriately. Therefore, an extension of the TAM was essential (e.g. Kim, Mirusmonov, & Lee, 2010) as in the literature, doubts about the

comprehensiveness and appropriateness of this theory rises. Especially the absence of social influence was recognized (López-Nicolás, Molina-Castillo, & Bouwman, 2008). Besides, research detected significant concerns about privacy and security in MP (Au & Kauffman, 2008). Consequently, trust in MP systems was identified to be an essential predictor of MP adoption (e.g. Gong, Zhang, Zhao, & Lee, 2016; Xin, Techatassanasoontorn, & Tan, 2013). Therefore, we enhanced our model by integrating trust-related variables and variables representing social aspects.

Due to the importance of the factor trust in MP research (e.g. Gao & Waechter, 2017; Khalilzadeh, Osturk, & Bilgihan, 2017), and following Dahlberg et al. (2003), who saw the necessity to integrate trust into the TAM for financial services, trust-related aspects were added into the model. Besides "Trust in MP (TR)", the variable "Perceived Data Security (DS)" is closely related to trust (Harauz, Kaufmann, & Potter, 2009) as it was found to be a predictor for trust in the case of e-banking (Yousafzai, Pallister, & Foxall, 2003) and electronic payment systems (Kim, Ferrin, & Rao, 2008). Furthermore, Dahlberg et al. (2003) postulated data security to be a crucial factor for MP, as the platform receives private financial and personal data. The effect of security on the intention to use MP at the point of sale empirically were prove by Khalilzadeh et al. (2017). The third variable of the trust-related aspects is the "Perceived Fraud Risk (FR)". As security in the form of protection of users from the risk of fraud and financial loss has shown to have an essential impact on the attitude towards the use of online financial services (e.g. Montoya-Weiss, Voss, & Grewal, 2003) and also has been used in the domain of mobile banking (Luarn & Lin, 2005) and MP (Mallat, 2007; Schierz et al., 2010), it was consequent to integrate this variable into the research model.

The social aspects "Social Influence (SI)" and "Technological Innovativeness (TI)" represent the third part of our developed research model. Social influence is defined as the extent to which someone believes that the opinion of important others (e.g. family and friends) influences one's behavior towards using a new technology system (Venkatesh et al., 2003). It is an essential element of technology acceptance models that were used in cultural comparison research. Herein, this variable is part of the Theory of Planned Behavior (Ajzen, 1991), which was used by Dinev et al. (2009) to investigate cultural differences of user behavior towards protective information technol-

ogies. As an element of the Unified Theory of Acceptance and Usage of New Technology (UTAUT) (Venkatesh et al., 2003), social influence was applied to investigate the acceptance of learning technologies across Germany and Romania (Nistor, Baltes, Dascălu, Mihăilă, Smeaton, & Trăuşan-Matu, 2014). Finally, Venkatesh and Davis (2000) were able to considerably increase the explanatory power of technology acceptance through the integration of social influence into the TAM 2. They verified this variable to be the most impactful factor on behavioral intention, particularly for inexperienced users of a technology (Venkatesh & Davis, 2000). Empirically validated as a predictor for the intention to use a technological system (Venkatesh & Davis, 2000), it was also found to influence the intention to adopt M-payment services (Yang et al., 2012). Therefore, social influence is a useful enrichment for our model.

Parasuraman (2000) in corporation with Rockbridge Associates implemented the variable of technological innovativeness as part of the so-called "National Technology Readiness Survey". They emphasized the relevance of using this scale for comparative studies of technology readiness across countries and cultures (Parasuraman, 2000). Thereby, innovativeness reflects the extent to which an individual believes he or she is a pioneer in using new technology-based services and products like MP (Parasuraman, 2000). Although technological innovativeness is not included in any of the dominant technology acceptance models, it found empirically support as an essential predictor for the behavioral intention to use MP (Thakur & Srivastava, 2014). Furthermore, consumers with a high level of innovativeness were identified to accelerate word of mouth communication, which exert a significant influence on consumers' attitude and purchase decision (Brown, Broderick, & Lee, 2007; Tang, 2017). Due to the important role of the communication process for the diffusion of innovations (Rogers, 2003), this concept is critical for marketing practitioners. Thus, we followed the example of Agarwal and Prasad (1998) and added the technological innovativeness to our TAM based research model.

5.3.3 Hypotheses

The concept of trust has been examined in a wide range of disciplines such as psychology, sociology and economics (Pavlou & Chai, 2002). Since trust is a crucial factor in an online environment in which consumers do not have direct control over the actions of the retailer (Roca, García, & de la Vega, 2009), a lack of trust in a payment system

is a main barrier of electronic commerce transactions (e.g. Siau, Sheng, Nah, & Davis, 2004). Therefore, trust aspects were often recognized as a key success factor for e-commerce (e.g. Hassanein & Head, 2007; Lee, Murphy, & Swilley, 2009) and online financial services (Suh & Han, 2002; Yu & Asgarkhani, 2015). Furthermore, several investigations had already verified a significant impact of trust-related aspects on the intention to use MP (e.g. Zhou, 2014; Xin et al., 2013).

Additionally, researchers identified trust to be an antecedent of perceived usefulness (Gefen, Karahanna, & Straub, 2003; Pavlou & Chai, 2002). As usefulness was identified to be an important predictor for MP adoption (e.g. Kim et al., 2010) analyzing influencing potentials on perceived usefulness is reasonable. Trust has proven to be related to the perceived ability of an information system to achieve a defined goal (e.g. Teo, Srivastava, & Jiang, 2009). Consumers do not have any reasons to believe that the information system is useful to accomplish their goals, if the person responsible for the technology is not to be trusted (Pavlou & Chai, 2002). Numerous investigations have already demonstrated the significant relationship of trust with perceived usefulness in the context of electronic commerce (Pavlou & Chai, 2002) and internet banking (Suh & Han, 2002). Consequently, we hypothesize:

H1: Trust in MP positively influences the behavioral intention to use.

H2: Trust in MP positively influences the perceived usefulness.

Perceived data security and fraud risk are both closely related to the trust construct (e.g. Kim et al., 2008). Innovations are commonly associated with risks (Cho, 2004). Since the illegal collection and sale of personal data could harm consumers in a variety of ways (Ratnasingham, 1998), Lwin, Wirtz and Williams (2007) investigated such risks, conceptualized as the likelihood of privacy invasion. They verified these aspects to be a crucial issue in the context of electronic services. Concerning electronic payment systems, the rise of data abuse and the fear of fraud risk is centre stage of consumerism (Levente & Sandor, 2016; Cimiotti & Merschen, 2014). Moreover, MP is often associated with a high loss potential concerning privacy and transaction data (Schierz et al., 2010; Dewan & Chen, 2005; Dong-Hee, 2010). Users feel the need for being in control of the recording and subsequent use of their sensitive data (Kobsa, 2001). Thus, research has shown that concerns about security are large barriers in the adoption of MP (Johnson, Kiser, Washington, & Torres, 2018; Schierz et al., 2010).

Consequently, any factors that enhance the perceived security and mitigate the fear of fraud risk increase the likelihood of MP adoption.

H3: Perceived data security has a positive impact on the behavioral intention to use.

H4: Perceived fraud risk has a negative impact on the behavioral intention to use.

As it was shown in several investigations, trust-related aspects significantly impact the intention to use MP (Xin et al., 2013; Zhou, 2014; Khalilzadeh et al., 2017). However, the influence of cultural differences on this relationship is not yet extensively examined. Therefore, Hofstede's dimensions of uncertainty avoidance and individualism vs. collectivism might provide explanations of differences in trust-related impacts. Cultures with a high level of uncertainty avoidance behaviors are organized and have reduced ambiguity and anxiety in the use of new technology (Bankole & Bankole, 2017). As technological solutions are more predictable than human solutions, they seem to be more attractive to them (Hofstede, 2001). In contrast, individuals of cultures with a low level of uncertainty avoidance would trust more on their competence to evaluate a situation and value new technologies (Veiga, Floyd, & Dechant, 2001). MP, as well as mobile banking, provides an organized and thoroughly structured platform with strict regulations regarding data security and fraud risk (e.g. Google, 2019). This is of particular interest in high-level uncertainty avoidance cultures. Therefore, these cultures have a higher initial trust level in those marketable technologies (Bankole & Bankole, 2017), whereupon we expect trust to have a greater influence in low-level uncertainty avoidance countries. Additionally, nations high in individualism rely on privacy protection and are more likely to possess insurance (Hofstede, 2001). They will be more apt to engage in a behavior if they feel to have enough control over the situation (Dinev et al., 2009). A high level of trust in the technology might provide this feeling of control and is positively associated with the intention to adopt MP (Xin et al., 2013). Consequently, we assume that the effect of trust-related aspects would be stronger for countries high in individualism and low in uncertainty avoidance.

H5: The impact of trust-related aspects on the behavioral intention to use MP is higher in the USA than in Germany.

According to the TAM, a technological system with a high value on PEU is assessed to be more useful. Furthermore, both variables affect the individuals' attitude towards using a technology, which itself affects the BI a technological system (Davis, 1989).

Modern applications for M-payment transactions are designed to be easy to use, which results in a greater likelihood of being adopted and also perceived as useful by the customer. Moreover, a consumer evaluate M-payment as useful, if the system will improve their efficiency during the payment process. The faster and easier a consumer can pay at the POS the more likely the system will be used. The relationship between PU, PEU and BI has been verified in a wide range of M-payment research (e.g. Guhr et al., 2013; Kim et al., 2010). Consequently, we suggest a positive correlation between PEU and PU as well as between both constructs and the BI.

H6: Perceived ease of use has a positive impact on the behavioral intention to use M-payment.

H7: Perceived ease of use has a positive impact on the perceived usefulness of M-payment.

H8: Perceived usefulness has a positive impact on the behavioral intention to use M-payment.

As we could find in previous research, perceived usefulness and perceived ease of use had a positive effect on the behavioral intention to use information systems in different countries (e.g. Guhr et al., 2013; Lee et al., 2013; Straub et al., 1997). Further, Guhr et al. (2013) observed a stronger influence of these two variables on the intention to use MP in Germany compared to the USA. The underlying rationale might be reasoned in the cultural differences of uncertainty avoidance. In order to reduce uncertainty, cultures high in uncertainty avoidance especially mitigate unknown situations. Thus, technological solutions seem to be more attractive to them, as these are more predictable than human solutions (Hofstede, 2001). However, specific technological requirements must be met to reduce uncertainty. The easier a technological system is to interact with, the higher the personal control in interacting with the system (Lepper, 1985). Additionally, people will use a technological system when they evaluate the system to be useful for fulfilling their personal needs, for improving their performances and to strengthen the quality of performing a transaction (Davis, 1989; Kim et al., 2010; López-Nicolás, Molina-Castillo, & Bouwman, 2008). Consequently, a technological system assessed as easy to use and useful can reduce uncertainty in performing a task (Davis, 1989). Therefore, high uncertainty avoidance cultures focus more on the technological aspects of a mobile service (e.g. Hung & Chou, 2014). In the case of bank services, Ladhari, Pons, Bressolles, and Zins (2011), as well as Al-Smadi (2012),

proved that consumers in such cultures put an increased emphasis on the usefulness and ease of use of these services. Contrary, cultures low in uncertainty avoidance do not seem to need the added assurance of ease of use and usefulness (McCoy, Galletta, & King, 2007). As MP is assessed to be a fast and easy way to facilitate the payment process at the point of sale (Trütsch, 2016), we assume the following hypothesis:

H9: The impact of technological aspects on the behavioral intention to use MP is higher in Germany than in the USA.

Corresponding to the explanation of the trust relationships, we expected social influence to have a twofold influence in our research model. Venkatesh and Davis (2000) have suggested the integration of social influence into the TAM and illustrated the relationships between social influence and the TAM variables perceived usefulness and intention to use. Further researches verified this positive relationship between social influence and behavioral intention (Agarwal & Karahanna, 2000; Venkatesh et al., 2003), especially in the case of online services (Bauer, Barnes, Reichardt, & Neumann, 2005; Luarn & Lin, 2005; Richard & Meuli, 2013; Teo & Pok, 2003) and in the domain of MP (Thakur, 2013; Yang et al., 2012). This correlation can be explained by the consumers' believes that important referents expect them to perform a specific behavior to enhance one's status within a social system. Thus, people may perform a behavior, even if it is not in accordance with one's beliefs (Venkatesh & Davis, 2000). Besides the direct relationship, Hong and Tam (2006) identified that social influence affects the adoption intention indirectly via perceived usefulness. Furthermore, Lu, Yao and Yu (2005) confirmed a positive direct influence on perceived usefulness in the case of mobile Internet services. A consumer may incorporate the beliefs of important referents into one's own (internalization) and adopt the attitude about the usefulness of technological systems (Kelman, 1958; Warshaw, 1980). Additional, the social expectation that one should intend using a technology can enhance someone's perception of the technology's value (Salancik & Peffer, 1978). Therefore, we hypothesize:

H10: Social Influence has a positive impact on the behavioral intention to use MP.

H11: Social Influence has a positive impact on the perceived usefulness of MP.

Individualism vs. Collectivism differs by the extent to which individuals are integrated into groups (Hofstede, 1980). Individuals that belong to an individualistic culture are expected to look only after themselves and their families as ties between individuals

in this cultural setting are loose. On the other hand, cultures that score low in individualism are integrated into a group from birth onwards. Therefore, they put higher emphasis on belonging to and respecting the opinion of other society members as well as adapting their views relatively easily to their environment (Hofstede, 2001; McCoy et al., 2007). The results of a meta-analysis by Bond and Smith (1996) could also verify these findings, indicating that more collectivistic cultures tend to show higher levels of conformity than individualistic cultures. Consequently, they attach more importance to the opinions of others (e.g. Shiu, Walsh, Hassan, & Parry, 2015), making them more likely to follow the advice of their familiar bank employees, who recommend them to adopt electronic banking (Zheng et al., 2013). Thus, a stronger correlation between social influence and the behavioral intention to use M-Payment for those countries can be assumed due to social pressure or affiliation motivation.

Furthermore, consumers may perform a behavior to feel more integrated into their social environment, even if they are not pleased with the demonstrated behavior or its consequences themselves (Venkatesh & Davis, 2000). The "Social Identity Theory" by Tajfel and Turner (1986) encompasses a possible explanation of this behavior. According to this theory, people categorize themselves into various groups, which are in correspondence to their behavior in order to reach a positive social identity. To encourage the belonging to a chosen in-group, individuals can demonstrate a specific normative behavior (Hogg & Terry, 2000; Tajfel & Turner, 1986) such as technological adoption (Wieseke, Kraus, & Rajab, 2010). This is particularly true for collectivistic individuals as norms, beliefs, and values of the in-group become more salient for them. As a result, they become more receptive to a complying behavior regarding these norms (Bond & Smith, 1996; Marcus & Kitayama, 1991; Triandis, 1989).

Several researchers have hypothesized that the relationship between social influence and the behavior intention to use a technology is stronger for collectivistic cultures. While some investigations could not support the assumption of a moderating impact of individualism/collectivism in information system research (e.g. Srite & Karahanna, 2006; Li, Hess, McNab, & Yu, 2009), others showed that in more collectivistic cultures, social influence has a stronger influence on the behavioral intention to adopt new technologies (Dinev et al., 2009; Lin, 2014; Tarhini, Hone, Liu, & Tarhini, 2017). Nevertheless, as valid results in the domain of MP are missing, we assume that high

individualistic countries do not emphasize social influences so strong compared to more collectivistic cultures when it comes to the behavioral intention to use MP.

H12: The impact of social influence on the behavioral intention to use MP is higher in Germany than in the USA.

Technological innovativeness is a consumer's inclination to be a pioneer in using technology-based systems (Parasuraman, 2000). Rogers (2003) classified different groups of consumers based on his time-dependent concept of innovativeness. He named innovators and early adopters to be the first consumers of innovative technologies (Rogers, 2003). Such innovators are confident in their technical skills and appreciate the potential benefits of technological innovations (Saaksjarvi, 2003). Therefore, subsequent research identified a positive relationship between domain-specific innovativeness and the adoption of Internet shopping (Citrin, Sprott, Silverman, & Stem, 2000; Lee, Temel, & Uzkurt, 2016). In the domain of MP, Guhr et al. (2013) used this scale as part of the technology readiness construct and identified a positive effect on the intention to use MP. Further, Slade et al. (2015) could verify a positive relationship in the case of remote MP, while Tan, Ooi, Chong and Hew (2014) found innovativeness to be the most significant predictor of behavioral intention in case of proximity MP. As MP is still in an early stage of technological diffusion, we assume the following hypothesis:

H13: Technological innovativeness has a positive impact on the behavioral intention to use MP.

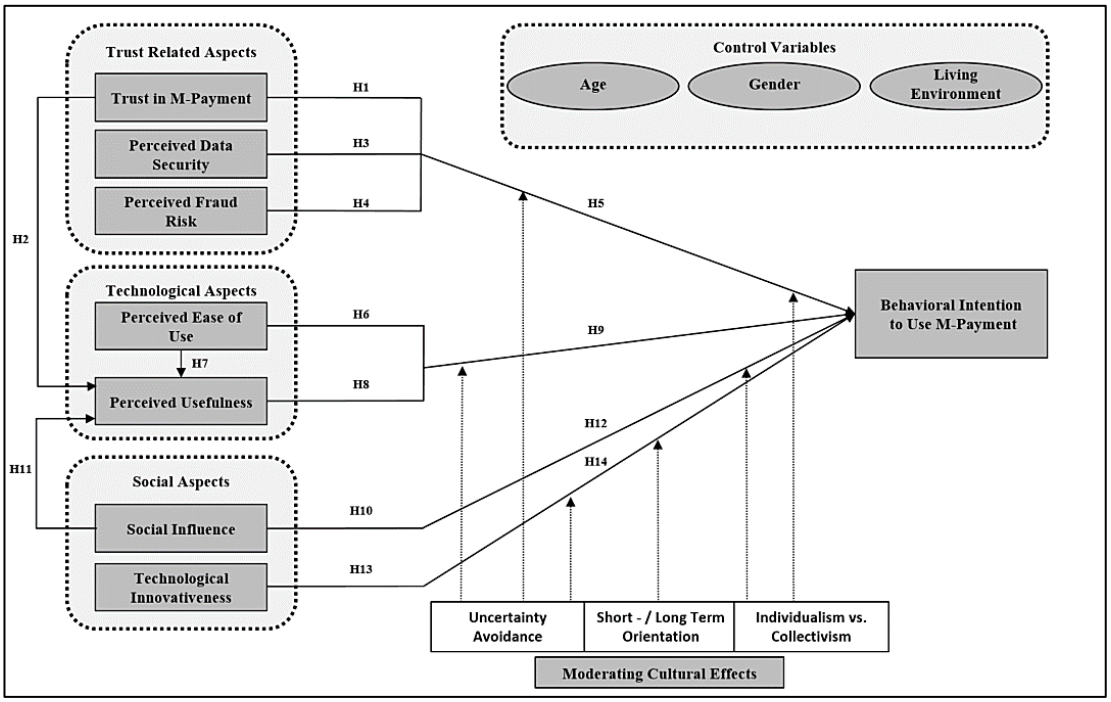
Subsequently, the cultural dimensions of uncertainty avoidance and short- vs. long term orientation might help to explain a moderating role of culture within this relationship. Cultures scoring low in long-term orientation prefer fostering virtues of the present and past, whereas cultures with a high long-term orientation take a more pragmatic approach. They are more oriented towards the future and can adapt their traditions easily to changing conditions (Hofstede, 2001; G. Hofstede, G. J. Hofstede, & Minkov, 2010). This pragmatic approach correlates with the properties of people scoring high in technological innovativeness. They are defined as persons who adopt new technological products earlier compared to others within their social system based on an intrinsic motivation to try out new technological possibilities (Agarwal & Prasad, 1998;

Bruner & Kumar, 2007). Thus, we expect the influence of innovativeness on the adoption of new technologies to be stronger in countries scoring high in long-term orientation.

Furthermore, new services carry uncertainty, which hampers its diffusion. People with a high level of technological innovativeness are more willing to take risks and are better informed about new technologies (Rogers, 2003). As the level of uncertainty avoidance is lower in the USA, people are more open-minded to innovation why they are rather searching for information about such novelties. In contrast, people in countries scoring high in uncertainty avoidance are only taking risks they are known (Hofstede, 2001). Therefore, particular attention is paid to the group of well-informed and risk-taking innovators while the MP diffusion process in Germany. Consequently, we argue that technological innovativeness will have a higher impact on the behavioral intention to use MP for high-level uncertainty avoidance countries. This line of argumentation is supported by the investigation of Guhr et al., (2013), who verified significant results for the relationship between technological readiness and the behavioral intention to use MP in Germany but not for the USA.

H14: The impact of technological innovativeness on the behavioral intention to use MP is higher in Germany than in the USA.

Figure 1. Research Model.



5.4 Research Design and Method

5.4.1 Operationalization of the Constructs

The TAM forms the theoretical basis of this examination and has been adapted to the subject of investigation. All variables selected could verify their goodness of fit in several investigations mentioned below. We used the behavioural intention to use MP as the dependent variable (e.g. Davis, 1989; Venkatesh et al., 2003). As a far lower dissemination of this payment method was expected in Germany, implementing this variable was appropriate to measure current usage and possible usage. As independent variable we used "perceived ease of use" to evaluate how much effort is required to handle MP technology (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). Furthermore, "perceived usefulness" measures the extent to which a person views the usage of MP as helpful to improve one's efficiency and effectiveness (Davis et al., 1989; Nysveen, Pederson, & Thorbjørnsen, 2005).

Additionally, we enriched the model by the variable "trust" which was recognized to be a central indicator for the intention to use MP (Arvidsson, 2014; Xin et al., 2013). Through the help of this independent variable, we wanted to determine the general trust in MP systems (Chandra, Srivastava, & Theng, 2010; Gefen, 2000; Xin et al., 2013; Zhou, 2014). Privacy concerns are of special interest regarding the rising need of data security, as disclosing sensitive financial data is required to conduct mobile payment processes. Therefore, we measure the extent to which a consumer is wary that MP providers are gathering personal information and using it for business purposes "data security" (Demoulin & Zidda, 2009; Kim et al., 2008; Leenheer, van Heerde, Bijmolt, & Smidts, 2007). Furthermore, the abuse of transaction data "fraud risk" was of special interest. The factor focuses on the degree of security a person perceived when using MP services (Luarn & Lin, 2005; Schierz et al., 2010). Additionally, the integration of "social influence" was of importance for the explanatory power of our research model. This variable measures the degree to which consumers are influenced by their environment. Following Yang et al. (2012), we modelled the construct by combining subjective norm and image (Thakur & Srivastava, 2014; Yang et al., 2012). Finally, "technological innovativeness" was expected to be an indicator for the intention to use, as it showed to be a distinguishing criterion between the analyzed cultures. The variable pays regard to the extent to which a consumer describes him/herself as a

technology pioneer and opinion leader (Mathwick, Wagner, & Ramaprasad, 2010; Parasuraman, 2000). The level of agreement was measured using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).

5.4.2 Data Collection and Sample

The results are based on a quantitative online survey. Since this study focuses on cross-cultural differences, the questionnaire has two different language versions (German and English). We focused on the behavioral intention to use MPs at the stationary point of sale (dependent variable) and the subjective assessment of "perceived ease of use", "perceived usefulness", "trust", "data security", "fraud risk", "technological innovativeness" and "social influence" (independent variables). Furthermore, we inquired the common use of payment processes in daily life. We added a description of a typical MP process at the stationary point of sale at the beginning of the survey to present the subjects with a realistic idea of the procedure. This brought all participants to a comparable level of knowledge regarding the subject under investigation. Lastly, after focusing on the constructs of the model, we requested the sociodemographic data to be able to classify the participants.

The study took place from the 2nd of December 2017 to January 5th 2018. The main distribution channels for the questionnaire were social media platforms such as "Facebook" and the career networks "Xing". To acquire American participants, personal e-mail lists and the online marketplace Amazon Mechanical Turk was used. The acquisition of survey participants for research using this platform has been proven to be a reliable instrument and a promising alternative for data collection. Mechanical Turk samples were verified as just as representative as other internet samples and even more compared to student samples (Buhrmester, Kwang, & Gosling, 2011; Landers & Behrend, 2015; Paolacci, Chandler & Ipeirotis, 2010). Particularly in the domain of information systems research, important findings could have been replicated using samples collected via Amazon Mechanical Turk (Goodman, Cryder, & Cheema, 2013; Steelman, Hammer, & Limayem, 2014). In order to ensure credibility and a high-quality sample, the platform offers effective targeting options (Peer, Vosgerau, & Acquisti, 2013). Thus, the participants had to match some specific eligibility requirements to take part in the survey and to get their compensation. First, they had to be American and experienced in taking part in surveys. Second, they had to have a high approval

rate. Consequently, only those were getting access to the questionnaire, which before were approved to be reliable in the execution of completed tasks. Finally, they had to be older than 18 years of age. In order to validate our survey, we conducted a pre-test, where we collected data from a sample of 30 participants in Germany and the USA to avoid uncertainties concerning the construct validity and to ensure an accurate understanding of all questionnaire elements.

As a result, 1185 persons participated in the survey, with 921 datasets being usable for further examination. The sample was segmented according to cultural belonging into the group of U.S. and German citizens. We could reach a balanced ratio of 461 U.S. and 460 German citizens. 34.3 percent of the U.S. citizens have already paid mobile at the point of sale, while only 11.3 percent of the German citizens had done so. A realistic distribution of the living environment of the participants is mirrored through this dataset. Thus, in the USA comparatively more people live in cities (United Nation, 2014). Therefore, we could find a higher rate of urbanization for U.S. compared to German citizens (54.7 to 37.6 percent). The following table 2 visualizes the composition and distribution of the samples.

Table 2. Composition and distribution of the samples.

Variable	Characteristic	Frequency		Percentage (%)	
		USA	Germany	USA	Germany
Gender	Male	235	232	51.0	50.4
	Female	226	228	49.0	49.6
	Total	461	460	100.0	100.0
	Male total	467		49.3	
	Female total	454		50.7	
Age	17 - 24 Years	83	247	18.0	53.7
	25 - 34 Years	185	154	40.1	33.5
	35 - 85 Years	193	59	41.9	12.8
	Total	461	460	100.0	100.0
	Average age in Years per Country	36	27		
	Average age in Years overall	32			
Occupation	Pupil	1	7	0.2	1.5
	Student	24	270	5.2	58.7
	Civil Servant	3	12	0.7	2.6
	Employee	262	109	56.8	23.7
	Employee in leading position	33	22	7.2	4.8
	Self-employed	83	21	18.0	4.6
	Housewife/-husband	25	3	5.4	0.7
	Out of work	12	1	2.6	0.2
	Retired or pensioned	13	8	2.8	1.7
	Other professional activity	5	7	1.1	1.5
	Total	461	460	100.0	100.0
Living environment	Rural	97	84	21.0	18.3
	Provincial	112	203	24.3	44.1
	Urban	252	173	54.7	37.6
	Total	461	460	100.0	100.0
Usage Mobile Payment	People who already paid mobile at the Point of Sale			34.3	11.3

5.5 Results

5.5.1 Measurement Model

As this study aims to identify group differences between Germany and the USA, we validated the measurement and structural model for both groups. To evaluate the data, we used the "IBM SPSS AMOS 25" statistical software (Arbuckle, 2017). First, an exploratory factor analysis was conducted and confirmed the assumed one-dimensionality of the variables under investigation. Second, we assessed the reliability and validity of the used scales by calculating Cronbach's alpha, composite reliability (CR), convergent validity as well as discriminant validity for both groups. Our analysis indicated that all constructs exceeded the recommended thresholds of 0.70 (Nunnally, 1978) for Cronbach's alpha. We used factor loadings, CR and average variance extracted (AVE) to assessed convergent validity. Factor loadings are recommended to exceed 0.5 (Fornell & Larcker, 1981; Hair, Anderson, Tatham, & Black, 1995), CR should be above the value of 0.8 (Nunnally & Bernstein, 1994) and AVE should exceed 0.5 (Barclay, Higgins, & Thompson, 1995). As visualized in table 3 and 4, all the criteria for convergent validity were satisfied.

Following the approach of Fornell and Larcker (1981), discriminant validity is established by showing that the average variance extracted through one construct is greater than its shared variance with the other variables, which is measured by their squared correlations. It is equal to the approach of Fornell and Larcker (1981) to illustrate discriminant validity by showing that the square roots of the AVEs are greater than the corresponding off-diagonal inter-construct correlations (Henseler, Ringe, & Sarstedt, 2015) as shown in table 5 for the entire sample and table 6 for the German and the US sample separately.

Table 3. Internal reliability and convergent validity of the measurements for the total sample.

		Internal reliability	Convergent and discriminant validity		
Construct	Item	Cronbach's α	Factor loading	CR	AVE
Perceived ease of use (EU)	EU 1	.912	.832	.935	.743
	EU 2		.835		
	EU 3		.889		
	EU 4		.872		
	EU 5		.880		
Perceived usefulness (PU)	PU 1	.925	.883	.927	.808
	PU 2		.926		
	PU 3		.887		
Data security (DS)	DS 1	.905	.912	.908	.767
	DS 2		.921		
	DS 3		.787		
Fraud risk (FR)	FR 1	.939	.891	.940	.839
	FR 2		.936		
	FR 3		.919		
Technological innovativeness (TI)	TI 1	.866	.806	.888	.665
	TI 2		.754		
	TI 3		.830		
	TI 4		.866		
Social influence (SI)	SI 1	.927	.689	.918	.694
	SI 2		.713		
	SI 3		.920		
	SI 4		.923		
	SI 5		.887		
Trust in M-payment (TR)	TR 1	.967	.881	.967	.881
	TR 2		.947		
	TR 3		.963		
	TR 4		.962		
Behavioral Intention to Use M-payment (BI)	BI 1	.975	.982	.976	.931
	BI 2		.961		
	BI 3		.951		

Table 4. Internal reliability and convergent validity of the measurements separated for Germany and USA.

	Germany (n=460)				USA (n=461)			
Construct indicators	Factor loadings	Composite reliability	Cronbach's alpha	AVE	Factor loadings	Composite reliability	Cronbach's alpha	AVE
Perceived Ease of Use (EU)								
EU 1	.824	.924	.925	.709	.891	.952	.954	.798
EU 2	.779				.908			
EU 3	.867				.911			
EU 4	.874				.852			
EU 5	.863				.902			
Perceived Usefulness (PU)								
PU 1	.848	.911	.912	.774	.940	.940	.937	.839
PU 2	.889				.951			
PU 3	.902				.854			
Data Security (DS)								
DS 1	.862	.874	.872	.699	.940	.934	.932	.826
DS 2	.876				.950			
DS 3	.765				.832			
Fraud Risk (FR)								
FR 1	.876	.919	.918	.791	.880	.941	.940	.842
FR 2	.915				.939			
FR 3	.876				.932			
Technological innovativeness (TI)								
TI 1	.807	.878	.887	.644	.814	.898	.903	.689
TI 2	.733				.777			
TI 3	.810				.850			
TI 4	.856				.875			
Social influence (SI)								
SI 1	.664	.907	.916	.666	.668	.911	.922	.675
SI 2	.689				.689			
SI 3	.915				.918			
SI 4	.907				.916			
SI 5	.869				.879			
Trust in M-payment (TR)								
TR 1	.866	.953	.952	.836	.886	.972	.971	.897
TR 2	.908				.962			
TR 3	.946				.966			
TR 4	.936				.971			
Behavioral Intention to Use M-payment (BI)								
BI 1	.981	.966	.964	.903	.985	.981	.980	.944
BI 2	.961				.948			
BI 3	.908				.981			

Table 5. Inter-construct correlations and square roots of AVE for the total sample.

Construct	EU	PU	DS	FR	TI	SI	TR	BI
EU	**.862**							
PU	.439	**.899**						
DS	-.213	-.283	**.876**					
FR	.329	.446	-.501	**.916**				
TI	.607	.303	-.127	.238	**.815**			
SI	.078	.376	-.233	.446	.114	**.833**		
TR	.492	.623	-.527	.764	.359	.432	**.939**	
BI	.425	.682	-.392	.569	.386	.526	.735	**.965**

Table 6. Inter-construct correlations and square roots of AVE separated for Germany and USA.

	Germany (n=460)								USA (n=461)							
	EU	PU	DS	FR	TI	SI	TR	BI	EU	PU	DS	FR	TI	SI	TR	BI
EU	**.842**								**.893**							
PU	.456	**.880**							.339	**.916**						
DS	-.108	-.211	**.836**						-.262	-.267	**.909**					
FR	.277	.463	-.284	**.889**					.285	.330	-.602	**.917**				
TI	.580	.293	-.035	.175	**.803**				.639	.276	-.187	.267	**.830**			
SI	.007	.306	-.096	.346	.088	**.816**			.000	.332	-.236	.386	.092	**.822**		
TR	.491	.650	-.304	.727	.371	.337	**.915**		.424	.522	-.649	.729	.339	.355	**.947**	
BI	.384	.683	-.240	.494	.387	.488	.678	**.950**	.381	.609	-.452	.524	.366	.448	.708	**.971**

To evaluate the measurement model's fit, we combined numerous model fit indices to reduce the risk of committing type 1 and type 2 errors (e.g. Hu & Bentler, 1995; Sharma, Mukherjee, Kumar, & Dillon, 2005). Hu and Bentler (1995) suggest for case numbers between 150 and 5000 to combine the Tucker-Lewis Index (TLI), the Incremental Fit Index (IFI), the Comparative Fit Index (CFI) as well as the Standardized Root Mean Square Residual (SRMR) to validate the model. This combination promised the lowest risk of committing type 1 and type 2 errors. Additionally, we included the ratio χ^2 to the degrees of freedom (χ^2/df), the normed fit index (NFI) and the root mean square error of approximation (RMSEA). The ratio χ^2 to the degrees of freedom (χ^2/df) = 2.828, CFI = .977, NFI = .965, IFI = .977, TLI = .973, RMSEA = .045 and the SRMR = .050 indicated a good model fit. To summarize, the analysis provides support for the measurement modeling for both cultures.

5.5.2 Structural Model and Hypothesis Test

The structural model assesses the assumed relationships among the constructs for the German and the US sample. To validate the structural model, we incorporated the same fit indices as in the measurement model. The ratio χ^2 to the degrees of freedom (χ^2/df) = 2.822, CFI = .977, NFI = .965, IFI = .977, TLI = .973, RMSEA = .044 and the SRMR = .050 indicated a good model fit. Table 7 summarizes the model fit indices of the measurement models and the structural models and shows the recommended values for each fit index.

Table 7. Model fit indices of the measurement and structural model.

Fit index	Measurement model		Structural model		Recommended value
	GER	USA	GER	USA	
χ^2/df	1.596	2.039	1.584	2.050	≤ 3.00 (Homburg & Giering, 1996)
CFI	.979	.972	.980	.972	≥ 0.92 (Joreskog & Sorbom, 1996)
NFI	.947	.948	.947	.947	≥ 0.90 (Fornell & Larcker, 1981)
IFI	.980	.973	.980	.972	≥ 0.90 (Bollen, 1989)
TLI	.975	.967	.976	.967	≥ 0.90 (Homburg & Baumgartner, 1995)
RMSEA	.036	.048	.036	.048	≤ 0.06 (Joreskog & Sorbom, 1996)
SRMR	.042	.056	.042	.057	≤ 0.08 (Hu & Bentler, 1999)

To account for confounding demographic differences and refine the results of the structural model, we controlled for age, gender and living environment. Gender and

living environment did not significantly affect the intention to use MP, whereas a significant relationship between age and intention to use was identified for Germany and the US.

The proposed research model achieved a high value of R^2 (BI) = .628 for the US and R^2 (BI) = .648 for Germany. For the USA trust had the highest effect on BI (H1, β = .442, p < .001), followed by perceived usefulness (H8, β = .266, p < .001), social influence (H10, β = .216, p < .001) and technological innovativeness (H13, β = .114, p < .05). Comparable results could be detected for Germany. Here, perceived usefulness had the highest effect on BI (H8, β = .377, p < .001), followed by the trust aspect (H1, β = .293, p < .001), social influence (H10, β = .258, p < .001) and technological innovativeness (H13, β = .148, p < .001). Surprisingly, our analysis could not confirm an impact of fraud risk (H4, USA: β = -.032, n.s.; GER: β = -.034, n.s.) and perceived ease of use (H6, USA: β = .054, n.s.; GER: β = -.023, n.s.) on BI for both countries. The relationship of data security on BI was found to be significant in Germany (H3, β = -.069, p < .05) but not in the USA (H3, β = -.044, n.s.). Thus, we had to reject H4 and H6, whereas H1, H8, H10 and H13 could be confirmed. H3 could be partly confirmed. Furthermore, perceived usefulness was predicted by perceived ease of use (H7, USA: β = .183, p < .001; GER: β = .208, p < .001), trust (H2, β = .386, p < .001; GER: β = .505, p < .001) and social influence (H11, β = .208, p < .001; GER: β = .138, p < .001) in both countries. The summary of the results can be seen in table 8 and 9.

Table 8. Summary of the hypothesis test (GER).

Hypotheses	B (unstandardized coefficient)	SE B	C.R. (critical ratio)	β	P
H1: TR → BI	.359	.074	4.848	.296	<.001***
H2: TR → PU	.600	.061	9.914	.505	<.001***
H3: DS → BI	-.097	.048	-1.996	-.069	<.05*
H4: FR → BI	-.049	.071	-0.691	-.034	n.s.
H6: PE → BI	-.032	.065	-0.500	-.023	n.s.
H7: EU → PU	.294	.068	4.348	.208	<.001***
H8: PU → BI	.384	.046	8.334	.377	<.001***
H10: SI → BI	.395	.054	7.347	.258	<.001***
H11: SI → PU	.208	.064	3.221	.138	<.01**
H13: TI → BI	.207	.061	3.398	.148	<.001***

Note: B = unstandardized coefficient, SE B = standard error B, C.R = critical ratio, β = standardized coefficient, p = p-value; (* p < .05;** p < .01; *** p < .001)

Table 9. Summary of the hypothesis test (USA)

Hypotheses	B (unstandardized coefficient)	SE B	C .R. (critical ratio)	β	P
H1: TR → BI	.462	.058	7.992	.442	<.001***
H2: TR → PU	.306	.040	7.735	.386	<.001***
H3: DS → BI	-.051	.050	-1.018	-.044	n.s.
H4: FR → BI	-.039	.061	-0.641	-.032	n.s.
H6: EU → BI	.100	.086	1.164	.054	n.s.
H7: EU → PU	.258	.067	3.831	.183	<.001***
H8: PU → BI	.350	.051	6.812	.266	<.001***
H10: SI → BI	.246	.042	5.877	.216	<.001***
H11: SI → PU	.180	.040	4.516	.208	<.001***
H13: TI → BI	.174	.068	2.558	.114	<.05*

Note: B = unstandardized coefficient, SE B = standard error B, C.R = critical ratio, β = standardized coefficient, p = p-value; (* p < .05;** p < .01; *** p < .001)

To evaluate the moderating effect of culture, we followed the procedure proposed by Chin (2000), which was already applied to validate the moderating effects of experience in the domain of MP (Liébana-Cabanillas et al., 2014). According to Chin (2000), interaction effects can be analyzed by comparing the path coefficients of each group and calculate pair-wise t-tests to test for significance.

In a first step, an invariance test through a χ^2 value comparison (and the degrees of freedom) for the overall model and the constrained model was conducted, resulting in a significant difference (table 10). This is important, as the computation of the t-value depends on the invariance of the standard errors. Our results indicate that the standard errors were unequal in the two groups, as the invariance could not be confirmed. In the case of standard error inequality, Chin (2000) proposed to compute a t-test based on the unstandardized path coefficients and the corresponding standard errors. The results and the formula used for the calculation can be seen in table 11.

The results of the moderation analysis could confirm H12, as the coefficient of the effect of social influence towards BI was significantly higher among the German citizens (β_{GER} = .208; β_{USA} = .180; t = 2.18, p < .01). Accordingly, the impact of social influence is higher in Germany. Concerning H5, H9 and H14, the results cannot confirm the made hypothesized assumptions and we had to reject all of them. The influence of technological innovativeness, the trust-related- and technological aspects on BI did not differ between Germany compared to the USA.

Table 10. Invariance analysis

Overall model	**χ2**	**df**	**Δχ2**	**Δ gl**	**p-Value**	**Invariant**
Unconstrained	1617.36	890	319.56	16	<.001***	No
Fully constrained	1936.92	1006				

Table 11. Results of the moderation hypothesis testing

Moderating effect				**Culture**					**Differences**
Hypothesis	Effect			GER	p	USA	p	t-test	
H5	Trust related aspects								
	TR	→	BI	.359	<.001***	.462	<.001***	-1.10	No
	FR	→	BI	-.049	n.s.	-.039	n.s.	-.11	No
	DS	→	BI	-.097	<.05*	-.051	n.s.	-.66	No
H9	Technological aspects								
	EU	→	BI	-.032	n.s.	.100	n.s.	-1.22	No
	PU	→	BI	.384	<.001***	.350	<.001***	.50	No
	Social aspects								
H12	SI	→	BI	.208	<.001***	.180	<.001***	2.18*	Yes
H14	TI	→	BI	.207	<.001***	.174	<.05*	0.36	No

Procedure suggested by Chin (2000): A multi-group analysis based on Student's t-test: H_o: $B_1 = B_2$, where $t = \frac{B1-B2}{\sqrt{SE_1^2 * SE_2^2}}$; B_i : path weights; SE_i : standard error of the path in the structural model

p = p-value; (* p < .1;** p < .01; *** p < .001)

5.6 Discussion

5.6.1 Summary of the Results

The aim and motivation of this study was to attain a deeper understanding of MP adoption and diffusion processes. Thus, we developed a research model by integrating important variables of MP and cultural research to compare two western societies characterized by a different level of MP diffusion. Herein, this study followed the call of the renowned scientists Dahlberg et al. (2015), who encouraged multi-country studies concerning MP to ensure a better generalizability of current results. By doing so, we compared Germany and the USA among trust-related, technological and social aspects to investigate differences in the influence of mentioned variables on the behavioral intention to use MP.

The results of the investigation confirmed that the intention to use MP systems differ significantly between Germany and the USA. More precisely, U.S. citizens assessed MP to be more useful, easier to use and more trustworthy. In addition, the intention to use MP was decisively higher among U.S. citizens. In a separate assessment of the dataset, we identified trust in MP to have the strongest impact on the intention to use

in the USA, while perceived usefulness exerts the strongest influence in Germany. Additionally, social influence and technological innovativeness were detected as important factors to affect the intention to use MP in both countries. Concerning the crucial predictors of perceived usefulness, trust was detected to have the strongest correlation in Germany and the USA. But also ease of use and social influence had an impact on perceived usefulness in both countries. Furthermore, Hofstede's cultural dimension of individualism vs. collectivism as distinctive features between chosen cultures were found to moderate the effects between social influence and the BI. We identified that the positive impact of social influence on the BI was significantly stronger in the country with a lower level of individualism. Thus, the impact of social influence on the behavioral intention to use MP is higher in Germany than in the USA. Apart from this moderating effect, we could not detect any other cultural influence on the investigated relationships within our research model. Surprisingly, perceived ease of use and fraud risk did not reveal any significant effects. Data security impact the intention to use for the German sample only. The absent significance of perceived ease of use is in line with the results of Roca et al. (2009), who illustrated that e-investors are more concerned about their investment performance rather than the platform's perceived ease of use. Similar results were found in case of online banking (Selvanathan, Krisnan, & Jun, 2017). Contrary to prevailing findings in MP literature, data security and fraud risk appeared among the factors with a weak or without a significant impact on the BI in the present study. Since German citizens in particular assessed these variables to be problematic in dealing with MP systems, a possible reason can be found in the study of Pousttchi and Wiedemann (2007) and Aydin and Burnaz (2016). They recognized subjective security as not being an important influencer of MP acceptance and BI. The relatively low influence of these security aspects on the BI indicates that users are slowly overcoming this barrier. They expect those systems to be secure so that they do not consider security aspects in their decision-making process to use MP. Thus, the consumers' security concerns are less important than their concerns regarding general trust to the provider and the perceived usefulness of the system (Aydin & Burnaz, 2016).

5.6.2 Theoretical and Practical Implications

The examination of cultural differences between two western societies concerning the

BI proximity MP widens the scope of current research and responds to the call for deeper investigations in this area (Dahlberg et al., 2015). For this reason, the extracted findings allow us to draw more relevant theoretical and practical implications. With the development and validation of an extended TAM, our study attempts to contribute to a deeper understanding of MP adoption. Although the TAM is a parsimonious and robust model of technology acceptance behaviors across countries (e.g. Rose & Straub, 1998), we posit that some extensions need to be done to explain the intention to use MP more appropriately. Consequently, the study adopted and empirically tested several constructs previously considered as being beneficial to investigate MP adoption. Beside trust-related aspects (Xin et al., 2013; Zhou, 2014) also personal traits, such as social influence (Dinev et al., 2009; Thakur, 2013; Yang et al., 2012) and technological innovativeness (Guhr et al., 2013; Thakur & Srivastava, 2014) were included. To examine the cultural influence between Germany and the USA considering MP adoption, Hofstede's (2001) cultural dimensions were integrated into our model. Thus, we could develop our model based on the integration of different theories and could make an essential contribution to the emerging literature on MP.

The results justify the extension of TAM through personal trait factors as social influence and technological innovativeness were found to be crucial drivers for the intention to use MP in both countries. Further, our results confirm the importance of social influence, particularly for inexperienced users detected by Venkatesh and Davis (2000). As the adoption of MP is distinctly higher in the USA, we could verify that the impact of social influence on the behavioral intention to use MP is higher in Germany. Besides, technological innovativeness was also found to have an influence in Germany as well as in the USA, supporting the integration into our research model. Due to the growing importance of word-of-mouth communication on consumer attitude and purchase intention (Tang, 2017), innovators represent a crucial customer group for the diffusion of innovation. Thus, the detected results are particularly essential for marketing research.

Contrary to previous expectations, the core TAM variable "perceived ease of use" did not show a significant effect on the BI for both countries investigated. According to Venkatesh et al. (2003), perceived ease of use will only show a significant influence on attitude in the initial stage of technology adoption. This could be an explanation of why there is no significant influence in the USA as MP is far more adopted there than

in Germany. Additionally, other research regarding mobile services in general and particular in mobile payment was not able to confirm the significant effects of ease of use on the behavior intention either. (Slade et al., 2015; Zarmpou et al., 2012). Besides, the two trust-related aspects of data security (only for the USA) and fraud risk did not show a significant effect on the BI. Consumers might consider security aspects to be a fundamental prerequisite so that their decision to use an MP system depends on other factors.

Further, it is essential to figure out in which way cultural differences related to BI, not only for the theory but also for MP providers in order to develop solutions that meet the customers' needs. Through the integration of Hofstede's cultural dimensions into this field of digital technology, divergent findings of technological adoption and diffusion can be explained. This is particularly true for countries with very different cultures. While Dastan and Gürler (2016) identified perceived usefulness not to be a significant predictor for MP adoption in Turkey, Kim et al. (2010) for Korea and Liébana-Cabanillas et al. (2014) for Spain identified the opposite effect. Thus, current results should be reconsidered concerning cultural differences, even if culture seems to be similar as our results can show. Especially in the theoretical explanation of divergent impacts of social influence on BI, Hofstede's proven approach seems reasonable. In conclusion, we can state that the defined research model can be transferred to other fields of technological innovation studies, as the results concerning the goodness of fit of the models are satisfactory. However, as we could only detect one moderating effect of Hofstede's cultural dimensions, this investigation contributes to the discussion if national/regional culture averages becoming obsolete in times of continuing globalization (Tara et al., 2008).

We also suggest practical recommendations to recognize influencing factors for the expedient control of MP strategies. For a successful implementation of MP services, it is of crucial relevance to get knowledge about the consumers' crucial drivers explaining their usage intention (Bailey, Pentina, Mishra, & Ben Mimoun, 2017). As MP is well established in the USA, a comparison to a less-developed market such as Germany can create valuable insights for marketing strategies. A broad range of companies such as technology companies, credit card providers, banks and retailers within the MP eco-system can profit from the growing market and its enormous potential.

While successful MP business models cannot directly be transferred to different cultural contexts due to varying market constraints (Ondrus et al., 2009), the same applies to marketing communication strategies. MP providers need to know the crucial drivers of the intention to use such a system to emphasize these issues within their customer communication. Taking the results into account, they could benefit regarding the process of design, style and configuration of MP applications.

We identified trust to have a very high impact on BI in Germany and the USA. Analyzing the content of the websites of the most established MP providers in Germany and the USA, we can develop target-oriented recommendations. While "Google pay" and "PayPal" emphasize the trust-related aspect on their promotion websites in the USA, more profound trust-building remarks are missing on the German "PayPal" website (Google, 2019; PayPal, 2020 a, b). Furthermore, the German "Sparkasse" corrected false rumors around MP safeness to build up a trustful relationship with potential users (Sparkasse, 2018). Apple copied these strategies to promote its market entry in Germany and to improve its market development in the USA (Apple, 2020). As banks are trusted the most regarding handling payment transactions (e.g. Mallat, 2007), technology companies should enter into cooperation with such institutes to establish their systems on both markets.

As described, perceived ease of use is not a significant predictor of the intention to use MP, whereas perceived usefulness had a strong correlation with BI in both countries. By analyzing the contents of named MP providers, we noticed that all of them highlight the fast and easy way to use MP. Instead of the device's intuitive use, we recommend to emphasize on the aspects of usefulness and trust in the system. All providers point out the usefulness of paying mobile at the point of sale, but it can be improved by offering value-added services. For instance, Google pay offers the possibility to pay friends in the USA, even those not using the service, or to buy transit tickets online and save it directly within the application (Google, 2019). Googles' strategy can be a role model for entering the German marketed. Additionally, a cooperation with Payback as the largest German provider of bonus systems might be an option of adding value to MP customers.

Regarding the relationship of social influence on the behavioral intention to use MP, a significant influence was ascertained. Additionally, the results verified that the impact

of social influence on the behavioral intention to use MP is higher in Germany. German citizens score lower in individualism compared to the U.S. citizens. Thus, they pay more attention to the opinion of other society members and they adapt their views relatively easily to their environment (Hofstede, 2001; McCoy et al., 2007). In order to guide social influence on target customers, provoking electronic word of mouth processes appear to be a powerful instrument with the potential to change the attitude towards using a service (e.g. Lee, Rodgers, & Kim, 2009). Therefore, MP providers in Germany should try to trigger word of mouth concerning their systems on social platforms such as YouTube and Facebook. This gains in importance because technological innovativeness has a significant impact on BI in Germany and the USA. As people scoring high in technological innovativeness are essential for the diffusion process of innovative technologies (Rogers, 2003), a target-orientated communication of this group in order to provoke electronic word of mouth process promises great potential for German marketers.

5.6.3 Limitations and Future Research

We are aware that the research presented may have some limitations. This offers opportunities for further research by investigating not only inter-, but also intra-cultural differences concerning the behavioral intention to use MP. Thus, differences in age, income and the educational background can lead to varying results. Furthermore, investigating the circumstances of the living environment is very interesting because many rural areas lack in high-speed broadband, a necessity in today's economy. This hampers the diffusion of Internet technologies (Whitacre, 2010). Analysing existing research papers in the domain of MP has led to the presented model. However, there might be some disregarded independent variables not mentioned in the research model, which can be responsible for differences in the use of the MP depending on cultural disparities between Germany and the USA. To investigate cultural differences in the intention to use MP more comprehensively, variables representing individual specific differences such as mobile self-efficacy (Duane, O'Reilly, & Andreev, 2014) and mobility (Lu, Wei, Yu, & Liu, 2017) can be used. Although Hofstede's cultural dimension theory is extensively used and empirical validated in information system research (e.g. Srite & Karahanna, 2006) there are a few critiques. Herein, several studies identified national cultures to be fast changing constructs (Taras et al., 2009) while others believe

that culture is relatively enduring (e.g. Hofstede, 2001). Therefore, Hofstede's cultural indicators are assed as a stable and slowly changing representation of culture (Dinev et al., 2009). Additionally, people across the world have different cultural values. Consequently, they might be influenced by more than just geography (Taras et al., 2009). Thus, future research could implement selected cultural variables into their model to separate different groups more accurately.

5.7 Appendix

Variables		Items	Source
Trust in M-Payment (TR)	TR 1	I trust mobile payment systems to be reliable.	Arvidsson, 2014; Xin et al., 2013
	TR 2	I trust mobile payment systems to be secure.	
	TR 3	I believe mobile payment systems are trustworthy.	
	TR 4	I trust mobile payment systems.	
Perceived Data Security (DS)	DS 1	I dread that M-Payment transaction Data will be used to gather personal information.	Demoulin and Zidda, 2009; Kim et al., 2008; Leenheer et al., 2007
	DS 2	I fear that the M-Payment Provider will use my personal data for commercial reasons.	
	DS 3	I am not confident about how the M-Payment provider will use my personal information.	
Perceived Fraud Risk (FR)	FR 1	The risk of an unauthorized third party overseeing the payment process is low.	Luarn and Lin, 2005; Schierz et al., 2010
	FR 2	The risk of abuse of usage information (e.g. names of business partners, payment amount) is low when using mobile payment services.	
	FR 3	The risk of abuse of billing information (e.g. credit card number, bank account data) is low when using mobile payment services.	
Perceived Ease of Use (EU)	EU 1	Learning to operate the M-Payment (system) would be easy for me.	Davis, 1989; Davis, Bagozzi and Warshaw, 1989
	EU 2	I would find it easy to get the M-Payment (system) to do what I want it to do.	
	EU 3	My interaction with the M-Payment (system) would be clear and understandable.	
	EU 4	It would be easy for me to become skillful at using M-Payment.	
	EU 5	I would find M-Payment easy to use.	
Perceived Usefulness (PU)	PU 1	Using M-Payment (would) make me save time.	Davis et al., 1989; Nysveen et al.,2005
	PU 2	Using M-Payment (would) improve my efficiency.	
	PU 3	M-Payment (would) be useful to me.	
Social Influence (SI)	SI 1	People who influence my behavior think that I should use mobile payment.	Thakur and Srivastava, 2014; Yang et al., 2012
	SI 2	People how are important to me think that I should use mobile payment.	
	SI 3	People around me who use mobile payment have more prestige than those who not do.	
	SI 4	People who use mobile payment have a high profile.	
	SI 5	Using mobile payment is considered as a status symbol among my friends.	
Technological Innovativeness (TI)	TI 1	You can usually figure out new high-tech products and services without help from others	Mathwick, et al., 2010; Parasuraman, 2000
	TI 2	You keep up with the latest technological developments in your areas of interest.	
	TI 3	You enjoy the challenge of figuring out high-tech gadgets.	
	TI 4	You are always open to learn about new and different technologies.	

Behavioral Intention to Use M-payment (BI)	BI 1	I intend to use M-Payment systems in the near future.	Davis, 1989; Venkatesh et al., 2003
	BI 2	I predict I would use M-Payment systems in the near future.	
	BI 3	I plan to use M-Payment systems in the near future.	

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6 Research Paper 5: “Explaining the Acceptance of Social Trading Platforms: An Empirical Investigation”

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Abstract: The enormous rise of financial technology companies has greatly challenged traditional financial institutions. One emerging innovation is “social trading” (ST), which combines the advantages of social networks and delegated trading. ST platforms represent a unique context of social media platforms, on which the impact of social influence on the potential customer’s intention to use is not well understood. Moreover, researchers and practitioners lack an understanding of the moderating role of the consumer’s previous experience regarding security trading. As research in the field of ST is rather young, our study aims to be the first to address these research gaps by developing and empirically validating a model from the potential customer’s perspective. We based our framework on the Unified Theory of Acceptance and Use of Technology and theory regarding social media and financial decision-making. Our results illustrate that performance-related aspects are the dominant determinants of behavioral intention for experienced users, whereas system-related and personal barriers affect behavioral intentions of the inexperienced group. Consequently, differences regarding performance expectancy, effort expectancy, security and risk aversion were identified. Our results indicate that current platform operators’ advertising approaches of communicating the simple functionality of the platform seem inappropriate to meet the consumer’s needs.

6.1 Introduction

The global financial crisis hit the world in 2008 and shattered citizens' trust in European financial institutions (Wälti, 2012). Consequently, only 27 percent of German private investors in 2013 - compared to 39 percent in 2008 - ranked their banking consultant's trustworthiness as being high (Pellens & Schmidt, 2014). The decreasing satisfaction with the traditional banking business (Maisch, 2019) as well as higher security, flexibility or efficiency standards of new financial technologies (Lee, 2015) led to the enormous rise of FinTech companies. These companies digitalized, individualized and facilitated various established banking services, such as payment transactions, online banking, advisory and security trading (Dapp, 2014). As trust in established financial institutions has been slow to recover due to continued financial uncertainties, consumers used social media to share investment ideas (Oh & Sheng, 2011). A large number of investors shared their investment ideas on social platforms, such as Twitter (Sprenger, Tumasjan, Sandner, & Welpe, 2014), which affected the stock markets (Bollen, Mao, & Zeng, 2011; Oh & Sheng, 2011; Sul, Dennis, & Lingyao, 2017). This implies that the wisdom of the crowd can be a useful indicator to individual traders. Besides social intelligence, actively managed funds can increase an investor's performance and outperform the market (Kacperczyk, van Nieuwerburgh, & Verldkamp, 2014). However, these forms of delegated trading include high costs and fees, which lower the return rates (Ferreira, Keswani, Miguel, & Ramos, 2013). In this context, social trading (ST) combines the advantages of the wisdom of the crowd with active stock management (Pentland, 2013).

ST platforms are characterized by the facilitation of connections within an online community of investors, in which users can fully observe and automatically, simultaneously and unconditionally replicate investment strategies of other users based on relatively low costs (Pelster, 2017; Wohlgemuth, Berger, & Wenzel, 2016). Consequently, we face two types of users when accessing an ST platform: "signal providers" and "signal followers" (Doering, Neumann, & Paul, 2015). Signal providers publish their strategy and earn money through the participation of others on their trading volume or their performance. Signal followers copy strategies presented by signal providers, which is called "copy trading" (Wohlgemuth et al., 2016). Thus, the signal followers benefit from the signal providers' advanced knowledge and performance on the financial market. Contrary to the known trading forms with securities or funds, ST platforms

allow their traders to trade contracts for difference (CFD) papers or certificates, which results in lower costs and offers the possibility to diversify the individual portfolio with small amounts of money. However, CFD products are leverage products and can include high risks if the leverage is above 1:1.

Various platforms, namely “eToro”, “ayondo” and “wikifolio” are currently fighting for market shares of this growing financial niche territory in Germany. The emergence and diffusion of this innovative and automated investment approach can create pressure to other wealth management services and can pose a tangible threat to the traditional industry. The oldest and now world’s leading ST network eToro was founded in 2007 and has more than 6 million users worldwide (eToro, 2019c).

However, hesitant acceptance of ST is reported in Germany (Schwarzer, 2017). This begs the question, which factors predict the behavioral intention to use ST platforms from the potential customer’s perspective. As previous research in the field of ST is scarce and has merely focused on certain aspects of ST, such as the performance (Oehler, Horn, & Wendt, 2016), the signal provider’s investment behavior (Pelster & Hofmann, 2018) and trust dimensions (Wohlgemuth et al., 2016), the consumer’s perception of ST platforms is not well understood. To the best of our knowledge, a fundamental model to understand the main factors influencing the intention to use ST has not yet been established. Therefore, our study aims to fill this very research gap by developing an accurate research model from the potential signal followers’ perspective, who represent the majority of ST users.

Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) postulated by Venkatesh et al. (2003), we adjusted our research model for the special context of ST platforms, as these platforms differ significantly from other social media networks (Pelster, 2017). Therefore, we drew upon the platform categorization of Kane et al. (2014) as well as previous literature regarding financial decision-making in the context of information systems (IS). Additionally, we distinguished between trading-experienced and inexperienced potential customers, as marketers of ST platforms try to promote their service to a broader customer base, which includes the less affluent and inexperienced mass market customers. This comparison is also supported by previous research, which shows that the pattern of beliefs held by inexperienced users differ from experienced users (Karahanna, Straub, & Chervany, 1999; Venkatesh et al., 2003). Analyzing and understanding various effects across groups will help to

strengthen the theory and simultaneously benefit practitioners, as it demonstrates how different marketing strategies yield varying results for different user groups.

Our results indicate that performance-related components are the main drivers of the intention to use ST for the experienced group and play only a secondary role for inexperienced users. Accordingly, their intention to use ST is impeded by factors such as individual risk aversion, effort expectancy and perceived security. The suitability towards financial advice affects the potential user's intention in either group.

With the development and validation of the first research model to predict the intention to use ST platforms, our study attempts to contribute to a better theoretical understanding of the antecedents of user acceptance and resistance towards an adoption of these platforms. In order to do so, this study identifies the most important drivers of ST usage intentions by adhering to the nomological structure of UTAUT and adjusting the model for the context of a financial social media platform. As the moderating role of previous experiences has been scarcely investigated (Venkatesh, Thong, & Xu, 2016) and is essential for a deeper understanding of potential users (Karahanna et al., 1999), our model extends the current state of knowledge in the context of ST platforms.

From a practical perspective, knowing and understanding which factors predict the intentions of different consumer groups enables platform operators and marketers to employ target-oriented communication strategies. At the moment, platform operators strongly communicate the simple usability of their platform. However, our results demonstrate a weak effect of effort expectancy on intention to use. Based on the results of our investigation, marketers of ST are now able to emphasize only relevant criteria within their communication strategy, herein enhancing the effectiveness of their marketing significantly.

6.2 Theory and Research Model

As only little research into the field of ST has been undertaken, reliable information is still scarce (Gomber, Koch, & Siering, 2017). The most commonly used and most innovative investment approach of ST is mirror or copy trading. According to an investigation of approximately 150 million trades, about three thirds of the trades on the platform eToro are copy trades (Pelster & Hofmann, 2018). The copy trading approach grants private investors full insights into the trading strategies of successful traders'

portfolios and offers the possibility to automatically, simultaneously and unconditionally copy their strategies (BaFin, 2017; Lesser, Schneider, & Röder, 2015; Pan, Altshuler, & Pentland, 2012; Wohlgemuth et al., 2016). Through this approach, inexperienced private investors can save transaction costs and reach the same performance as skillful traders (Lesser et al., 2015), albeit reduced by performance-related remunerations and fees for the platform provider (Oehler et al., 2016).

Few studies have been published on the aspect of performance on ST platforms. Oehler et al. (2016) analyze the performance of the ST provider "wikifolio" and conclude that the best performing signal provider certificates outperformed the market in the short run. These findings are supported by Gottschlich and Hinz (2014) . The authors show that investors who follow experienced traders can reach well above-average returns. Pan et al. (2012) notice that social trades can generally outperform individual trades on the ST platform eToro. However, Pan et al. (2012) conclude that only fully rational signal followers select signal providers solely on the basis of performance indicators and that the selection on ST platforms is biased through social cues. This is consistent with more recent research of Ammann and Schaub (2016). The authors report that actual investment behavior of signal followers is not only driven by signal providers' objective performance measures but also by social interaction mechanisms such as investment-related comments (Ammann & Schaub, 2016). Pan et al. (2012) emphasize the vital role of trust in ST communities and identify that users assess the signal provider's expertise based on objective performance but also on social cues. Wohlgemuth et al. (2016) confirm that expert trustworthiness on ST platforms depends on cognition-based signals, such as profitable investment decisions but also on affect-based signals, such as the provision of the full name, a profile picture or frequent interactions.

Additionally, researchers have raised some issues regarding the investment behavior of signal providers. Some authors argue that signal providers on ST platforms are more susceptible to the disposition effect compared to traders who are not being followed by others (Glaser & Risius, 2018; Heimer, 2016; Pelster & Hofmann, 2018). This means, that signal providers are more likely to sell winning securities too soon and hold losing securities too long, thereby hampering their own performance (Glaser & Risius, 2018; Pelster & Hofmann, 2018). Consequently, the full transparency of ST platforms induces irrational biases on the signal provider's investment behavior which

are caused by recognition of being monitored (Glaser & Risius, 2018), the responsibility of financial advisory or the fear of reputational loss (Pelster & Hofmann, 2018). Gemayel and Preda (2018a) confirm the appearance of the disposition effect on ST platforms. However, the authors compare their results from ST to traditional online trading platforms and identify that the disposition effect is two to four times stronger in private online trading environments compared to ST platforms. This is supported by Pelster (2019), who demonstrates that signal providers with a large number of followers seem to be more cautious and execute less risky trades, which is particularly important for risk averse signal followers of ST platforms according to Berger et al. (2018).

To summarize, previous research has focused on actual investment behavior rather than explaining the determinants of potential acceptance of ST platforms. Therefore, current research is insufficient to explain the hesitant acceptance of ST platforms. Our study aims to close this research gap by identifying antecedents of the behavioral intention to use ST platforms. Herein, we suggest that the potential signal follower's intention to use will be determined by rational factors, as there is no actual bias through interaction or affect-based trust signals in the first place.

To explain the behavioral intention to use financial IS, numerous studies base their investigations on the UTAUT proposed by Venkatesh et al. (2003). The UTAUT has repeatedly confirmed its robustness in the context of mobile banking (e.g., Baptista & Oliveira, 2015; Zhou, Lu, & Wang, 2010), online stock trading (e.g., Wang, 2005) and mobile stock trading (e.g., Tai & Ku, 2013). Researchers refer to the UTAUT model as it bases on a comprehensive combination of eight previously validated research models of technology acceptance. Herein, the UTAUT combines the Theory of Reasoned Action (Fishbein & Ajzen, 1975), the Social Cognitive Theory (Bandura, 1986), the Technology Acceptance Model (TAM) (Davis, 1989), the Theory of Planned Behavior (Ajzen, 1991), the Model of PC Utilization (Thompson, Higgins, & Howell, 1991), the Motivational Model (Davis, 1989), the Innovation Diffusion Theory (Rogers, 1995) and the "C-TAM-TPB" Research Model (Taylor & Todd, 1995). According to these theories, the four main constructs "performance expectancy", "effort expectancy", "social influence" and "facilitating conditions" are identified to predict the behavioral intention to use a certain technology (Venkatesh et al., 2003). The UTAUT outperforms each of the eight original models by explaining nearly 70 percent of the

variance of intention to use IS (Venkatesh et al., 2003). Therefore, we use the basic structure of UTAUT and adjust the variables, which is consistent to the approach of other research in behavioral financial (Baptista & Oliveira, 2015; Tai & Ku, 2013; Zhou et al., 2010).

Performance Expectancy

In the original UTAUT, performance expectancy was defined "as the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003). In the context of ST, performance expectancy describes the degree to which potential users will realize improvements in their financial performance. As real performance of signal providers strongly influences actual investment decisions of signal followers (Ammann & Schaub, 2016; Glaser & Risius, 2018; Pelster, 2017; Pelster & Breitmayer, 2019; Pelster & Hofmann, 2018), we assume that the expected performance of ST platforms will be an antecedent of the consumer's intention to use ST. Berger et al. (2018) emphasize that expected returns play a vital role for investors on ST platforms. Additionally, an integration of expected returns is supported by established theory, such as the extensively applied capital asset pricing model (Lintner, 1965; Sharpe, 1964).

Effort Expectancy

Effort expectancy originally referred to the "degree of ease associated with the use of the system" (Venkatesh et al., 2003). Kane et al. (2014) emphasize that the novel capabilities of digital platforms can violate the assumptions of previous theories and that research models should be adjusted in order to apply them for specific social media settings. Accordingly, the capability of a social media platform is associated with the effort to access network resources, for instance selecting and copying an appropriate signal provider on ST platforms. Therefore, effort expectancy is defined as the degree to which a person perceives ST platforms to be free of effort and refers particularly to the search and copy function of ST, which is consistent with the study of Kane et al. (2014).

Social Influence

The variable social influence originally described "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003). Consequently, the variable referred to perceived rules of conduct

and is equivalent to what Deutsch and Gerard (1955) refer to as normative social influence. When it comes to the decision of adopting ST platforms, no rules of conduct can be identified. However, there is evidence that ST platforms induce social behavior and interaction among traders, which is one of their main characteristics (e.g., Ammann & Schaub, 2016; Glaser & Risius, 2018; Pelster, 2017). This is consistent with Kane et al. (2014), who claim that relational ties, such as advice ties are an essential feature of social media platforms. Consequently, we adjust the original social influence construct through advice suitability.

Research on ST indicates that relational ties depend on both, objective performance measures (i.e. profitable trades, returns, risk levels) and social cues (i.e. number of followers, profile pictures, interaction frequency, number of comments) (Ammann & Schaub, 2016; Glaser & Risius, 2018; Pelster, 2017; Pelster & Hofmann, 2018). The signal providers on ST transparently communicate underpinning rationales of their strategies and investments (Berger et al., 2018). Through the full transparency and communication features of ST platforms, users can acquire useful knowledge regarding trading strategies (Hölscher, Schwahn, Schneider, & Göring, 2017). Researchers claim that the connections on ST platforms are therefore constituted through investment advice (Doering et al., 2015) of the advising signal provider and the seeking signal follower (Pelster, 2017). Direct financial advice on ST platforms is given by the transparent provision of the signal provider's trading strategy, trading-related comments and discussions as well as by sharing investment information and ideas (Ammann & Schaub, 2016; Berger et al., 2018; Doering et al., 2015; Glaser & Risius, 2018; Pelster, 2017). Indirect advice on ST platforms is given through the platform community by the number of followers or number of leavers (Kromidha & Li, 2019; Wohlgemuth et al., 2016). Consequently, we integrated the potential user's suitability towards financial advice, which assesses the likelihood that a person would accept the opinion of another person with respect to a particular investment choice (Gershoff, Mukherjee, & Mukhopadhyay, 2007), as an essential antecedent into our research model. This is consistent with what Deutsch and Gerard (1955) described as informational influence, referring to the tendency to accept information from others as evidence about reality. According to Park and Lessig (1977), informational influence occurs in two ways. People directly search for information from experienced others or

make their decisions based upon observation of other's behavior. Both ways of informational influence with regard to financial information occur on ST platforms, making an integration of the variable financial advice suitability crucial.

Facilitating Conditions

The fourth construct of UTAUT, facilitating conditions reflects "the degree to which an individual believes that an organizational or technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). Regarding the technical infrastructure of an ST platform and the categorization of Kane et al. (2014), search and privacy functions of the network are highlighted to play a vital role to explain platform usage behavior. We have already included the search function within the Adoption of the variable "effort expectancy". In order to assess the consumer's intention to use, an assessment of the platform users' perception of data security is essential according to Kane et al. (2014). Hence, we included the variable "perceived security" as the usage of an ST platform requires the disclosure of sensitive financial and personal data, which consumers are concerned about (Dahlberg, Mallat, & Öörni, 2003). The variable "perceived security" is defined as the subjective probability with which users believe that their personal data, such as private or monetary information, will not be viewed, stored or manipulated by inappropriate parties (Flavián & Guinalíu, 2006; Kolsaker & Payne, 2002). Consequently, the construct perceived security captures a component of facilitating conditions as it refers to the consumers' privacy-related evaluation of the technical infrastructure of an ST platform (Xu & Gupta, 2009). This is consistent with UTAUT, as facilitating conditions are designed to remove hurdles of system use (Venkatesh et al., 2003). Furthermore, various research supports an integration of security-related constructs into the context of financial decision-making (Arvidsson, 2014; Kim, Tao, Shin, & Kim, 2010; Tai & Ku, 2013).

Risk Aversion

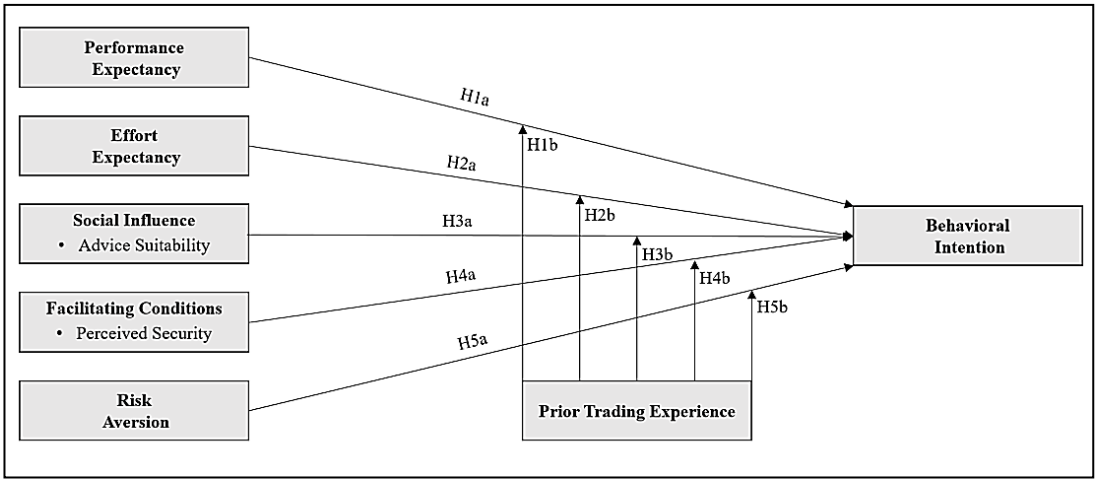
To investigate the intention to use ST platforms in a suitable manner we enhance the original UTAUT model. Literature regarding financial decision-making emphasizes the relevance of the investor's individual level of risk aversion (Fellner & Maciejovsky, 2007; Shimp & Bearden, 1982), particularly on ST platforms (Berger et al., 2018; Pelster & Breitmayer, 2019). Risk is usually identified in the presence of uncertainty (Pavlou, Liang, & Xue, 2007) and in situations where external factors affect the outcomes of individual decisions (Cruciani, 2017), which is the case on ST

platforms. In an investment context, risk refers to the possible divergence of actual future returns from expected returns (Sharpe, 1964) and is therefore an essential complementing factor of performance expectancy (Berger et al., 2018). Research on ST indicates that actual risk-taking behavior impacts the signal provider's actual investment behavior (Berger et al., 2018; Pelster & Breitmayer, 2019). Therefore, it is likely that the signal follower's risk aversion, which measures the degree to which a person expresses a desire to avoid taking risks (Donthu & Gilliland, 1996), will affect the intention to use ST for potential signal providers. Furthermore, risk aversion is correlated with other personal traits, such as the variables "extraversion", "conscientiousness" and "neuroticism" of the Big Five personality trait model by McCrae and Costa (1992) (e.g., Pan & Statman, 2012) and consequently accounts for a broad dimension of the individual's personality regarding financial decisions. Thus, we enhance the UTAUT model by integrating the variable "risk aversion".

Prior Trading Experience

Furthermore, Venkatesh et al. (2003) identified usage experience as a crucial moderator. Within the UTAUT framework, experience was based on the passage of time from the initial use of a new technology. As this study focuses on the intention to use ST platforms from a potential user's perspective, we propose that the consumer's previous experience with security trading will moderate the relationships of our research model. This is supported by established IS research, which indicates that feedback from previous experiences impacts various beliefs and can be an indicator of behavioral actions (Ajzen & Fishbein, 2005). Consequently, we integrate the variable "experience", which evaluates the degree of an individual's subjective knowledge regarding security trading (Hadar, Sood, & Fox, 2013). The integration of experience can also contribute to meaningful practical outcomes, as ST providers try to reach both, less affluent and inexperienced mass market customers as well as experienced potential customers. Accordingly, we add the variable into our research model.

Figure 1. Proposed Research Model



6.3 Hypotheses Development

The variable performance expectancy captures the notion of the ability of ST platforms to provide access to useful trading strategies, which can be copied in order to enhance the financial performance. We assume that this instrumental value of ST induces the expected performance. According to the Self-Efficacy Theory (Bandura, 1982), the expected outcomes depend on individuals' judgements of how well they will perform in a particular situation. The Social Cognition Theory of Bandura (1986) as a part of the UTAUT suggests that people are more likely to perform a certain behavior, if they expect valuable outcomes. Consequently, rational potential signal followers will show a higher intention to use ST, if they expect a higher performance from getting access to a valuable network of investors, which can be copied to enhance the individual's trading performance. Venkatesh et al. (2003) illustrated performance expectancy to show the strongest effect on intention to use IS among all observed variables of UTAUT. This is supported by previous research regarding mobile stock trading (e.g., Tai & Ku, 2013). Based on these arguments, we propose:

H1a: Performance expectancy has a direct positive effect on the behavioral intention to use ST platforms.

In the original UTAUT, Venkatesh et al. (2003) did not propose that the effect performance expectancy on intention will be moderated by experience. However, we assume that prior experience with security trading will moderate the relationship between the

expected performance and intention to use, which is consistent to Triandis (1980). Triandis (1980) model provides a theoretical explanation as to how pre-adoption beliefs are moderated by experience. He argues that prior experience will change perceived probabilities of behavioral consequences as well as the values of these consequence, herein modeling a feedback loop in his research model. As pre-adoption beliefs are based on indirect experience (Karahanna et al., 1999), it is reasonable to assume that performance expectancy is likely to be influenced by prior experience with security trading. One possible explanation for the moderation can be that experience with security trading might result in a more clear and confident evaluation about different future investments. Therefore, experienced investors are likely focusing on performance-related aspects rather than secondary factors, such as ease of use. This is consistent with previous studies on actual investment behavior on ST platforms. Kromidha and Li (2019) confirm that inexperienced signal followers are highly affected by the signal provider's personal credentials and that actual performance indicators play a minor role. Ammann and Schaub (2016) claim that especially inexperienced small investors are influenced by social interaction and rely less on performance indicators when deciding to copy signal providers. Accordingly, we suggest that performance expectancy will have a stronger influence on intention to use for potential users with prior experience in security trading compared to inexperienced potential users.

H1b: The effect of performance expectancy on the behavioral intention to use ST platforms will be moderated by experience, such that the effect will be stronger for more experienced potential users.

A second key aspect of explaining intention to use ST is effort expectancy, which refers to the required effort of becoming skillful with ST platforms and learning how to use search and copy functions. The Self-Efficacy Theory of Bandura (1982: 123) suggests that people particularly avoid behaviors "that they believe will exceed their coping capabilities". Additionally, people tend to perform those activities that they perceive to be easy to cope with (Bandura, 1982). This results in a direct positive effect of perceived ease of use on intention to use, which is proposed by Davis (1989) in the TAM. The Theory of Planned Behavior supports this conclusion, stating that "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991: 188) directly impacts a person's actual behavior, as individuals tend to expend more effort when they believe that they can bring a course of behavior to a successful conclusion. The TAM

and the Theory of Planned Behavior are underlying theories of UTAUT (Venkatesh et al., 2003). Therefore, we assume that the intention to use will increase if individuals perceive ST platforms to be easy to use. A positive correlation between effort expectancy and intention to use could be confirmed by Tai and Ku (2013) for mobile stock trading. The correlated variable of TAM "ease of use" has proven to be a significant direct predictor of attitude in the context of online trading (Lee, 2009) as well as for innovative financial services, such as mobile payment (e.g., Arvidsson, 2014; Dahlberg & Öörni, 2007; Mallat, 2007) and online banking (Tan, Chong, Ooi, & Yee-Loong Chong, 2010). Based on these arguments, we suggest:

H2a: Effort expectancy has a direct positive effect on the behavioral intention to use ST platforms.

We assume that the direct effect of effort expectancy on intention to use will be moderated by the potential user's previous experience with security trading. According to technology acceptance theory, experienced users become confident regarding the usage of similar systems and perceive that they can handle more complexity (Thompson, Higgins, & Howell, 1994). Particularly experienced consumers are able to compare ST platforms to other online or mobile trading systems with which they are already familiar. That means that even if ST platforms do appear difficult to use, experienced users perceive that they will be more likely to become skillful with such systems. Following the Self-Efficacy Theory of Bandura (1982), this results in an increased likelihood of using the system for experienced users. Inexperienced users are likely not familiar with other online brokers and therefore high levels of expected effort can represent a hurdle that decrease their intention to use ST. Therefore, ease of use will be more salient in the early stages of new behavior, especially when potential users are inexperienced (Bandura, 1982). This argumentation is also supported by technology acceptance theory (Davis, 1989; Venkatesh et al., 2003), which empirically illustrated that the direct relationship between ease of use and behavioral intention becomes less significant with an increasing level of experience. Consequently, we assume the following hypothesis:

H2b: The effect of effort expectancy on the behavioral intention to use ST platforms will be moderated by experience, such that the effect will be stronger for less experienced potential users.

As mentioned above, we suggest that social influence on ST platforms is manifested

through information influences with regard to financial advice. Kane et al. (2014) posit that the content of the social network, for instance the access to advice relations, information or available resources predicts the acceptance of social media platforms. The more highly the content of a social platform is valued, the more it improves the value of its social capital, which is defined as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998: 243). Through the full transparency and availability of trading strategies, comments and social interactions, ST platforms provide unique access to financial advice. Consequently, we assume that consumers with a high tendency to accept the opinion of others with respect to investment decisions intend to use ST platforms, which provide access to useful financial information and advice. Therefore, we assume that a higher level of advice suitability will result in a higher intention to use ST. Therefore, we propose hypothesis 3a:

H3a: Advice suitability has a direct positive effect on the behavioral intention to use ST platforms through performance expectancy.

We also suggest that the relationship between advice suitability and intention to use will be moderated by prior experience with security trading. According to the Innovation Diffusion Theory (Rogers, 1995) as a part of UTAUT, individuals evaluate their individual advantages or disadvantages of the usage of technology in the decision stage. Comparing experienced and inexperienced potential users, we provide two possible rationales for moderation. Firstly, greater experience with security trading will yield better knowledge and therefore reduce the individual's dependence on external advice. Secondly, uncertainty makes individuals feel uncomfortable and induces communication behavior (Rogers, 1995). As inexperienced users are highly uncertain about financial decisions, advice suitability will have a more pronounced effect on their intention to use ST, as individual advantages are higher for inexperienced individuals compared to experienced traders (Rogers, 1995). This is supported by current findings on ST which indicate that small investors, who are likely to be less experienced rely on social interaction and therefore financial advice when making investments (Ammann & Schaub, 2016). Various IS research confirms that the reliance on other's opinions is more salient when a behavior is new (Thompson et al., 1994; Ven-

katesh & Davis, 2000). Based on these rationales, we assume that advice suitable inexperienced potential users will have a higher intention to use ST platforms compared to advice suitable experienced potential users.

H3b: The effect of advice suitability on the behavioral intention to use ST platforms will be moderated by experience, such that the effect will be stronger for less experienced potential users.

Venkatesh (2000) identified the effect of facilitating conditions on intention to use to be fully mediated by effort expectancy. Therefore, Venkatesh et al. (2003) did not presume a direct effect of facilitating conditions in the original UTAUT, as both variables were highly correlated. The variable facilitating conditions was replaced by perceived security in our model, evaluating a privacy-related component of the technical infrastructure of ST platforms (Xu & Gupta, 2009). Therefore, perceived security is not proposed to strongly correlate with effort expectancy, leading to the assumption of a direct effect of privacy-related facilitating conditions on intention to use in our research model. The direct effect of perceived security on intention to use can be explained by using the Expectancy Theory of Vroom (1964), suggesting that individuals attempt to minimize negative consequences as a result of their behavior. Therefore, low levels of perceived security increase the probability of negative results such as fraud, resulting in a lower intention to use ST platforms. Additionally, the Privacy Calculus Theory suggests that privacy risks directly and negatively affect privacy behavior (Chellappa & Sin, 2005; Dinev & Hart, 2005). As a complementing variable of privacy risks, perceived security is proposed to show a direct positive influence on intention to use ST. Previous research in the financial domain confirmed this effect (e.g., Arvidsson, 2014; Kim et al., 2010; Tai & Ku, 2013).

H4a: Perceived security has a direct positive effect on the behavioral intention to use ST platforms.

Consistent with the theory of the UTAUT model, we assume that the relationship between privacy-related facilitating conditions and intention to use will be moderated by previous trading experience. Consumers who have already disclosed their financial data within the Internet and online broker services are familiar with data procedures of such websites and are therefore more likely to do so again. Familiarity with a website requires knowledge of relevant features and infrastructures, such as information search

(Gefen, 2000). Van Slyke et al. (2006) argue that an increasing familiarity with a specific merchant, in our case an online broker, leads to a decline in the importance of generalized privacy concerns, such as the disclosure of financial data. This is because a positive first-hand experience with a previous merchant is perceived more salient than the consumer's general privacy concerns. Therefore, familiarity helps to alleviate privacy-related risks due to positive previous experience (Li, 2014). Another explanation for the moderating role of experience can be provided regarding the risk calculus (Li, 2012). Familiarity with the website does not eliminate a potential risk of fraud or unintended use of personal information. However, the consumer is better equipped with individual strategies on how to deal with these risks, reducing the importance of perceived security (Li, 2012). Therefore, consumers with a low level of experience regarding online trading will have to overcome a bigger hurdle to disclose their financial data on the Internet. Additionally, they are not familiar with potential fraud risks nor with the data policies of online brokers, which results in a strong reliance on the platform's perceived security. Due to these arguments, we propose the following hypothesis.

H4b: The effect of perceived security on the behavioral intention to use ST platforms will be moderated by experience, such that the effect will be stronger for less experienced potential users.

In the Expected Utility Theory proposed by Kahneman and Tversky (1979), a person's risk attitude is an underlying variable of a person's utility function. This function describes the shape of the utility curve for an individual and the outcomes in question, such as the intention to use ST. Like on other investment platforms, financial decision-making on ST platforms involves risks (Berger et al., 2018). In addition to general investment risks, following an unknown signal provider will be perceived as risky. Consequently, individuals who desire to avoid risks (Donthu & Gilliland, 1996) might be less likely to use ST platforms. The higher the level of personal risk aversion, the less likely individuals will use ST platforms, as these platforms may be perceived as riskier and less trustworthy compared to traditional financial services. In the domain of financial decision-making under risk, numerous studies identified a negative correlation between the investor's risk aversion and their portfolio share of risky assets (e.g., Guiso, Sapienza, & Zingales, 2013; Merkle & Weber, 2014). Hoffmann et al. (2015) showed that investors with higher levels of risk tolerance were more likely to trade and

hold riskier portfolios. Based on these arguments, we presume:

H5a: Perceived risk aversion has a direct negative effect on the behavioral intention to use ST platforms.

The relationship between risk aversion and intention to use may be moderated by prior investment experience. Luhmann (1979) illustrated that familiarity increases the understanding of what has happened in the past, which reduces the risk of future expectations. Experienced users are particularly familiar with "how to read and compare the details of the products recommended and ranked by the recommendation agent" (Komiak & Benbasat, 2006: 946) and consequently more experienced in understanding the financial strategies and information provided by different signal providers. We presume that both experienced and inexperienced potential users are exposed to the risk of following signal providers with mismatching strategies. However, the level of risk aversion might not necessarily impact the intention to use ST significantly for trading-affine consumers, as they are experienced in choosing a signal provider who fits their risk averse strategy. Nevertheless, we assume that risk aversion affects the intention to use for experienced users, albeit less than for inexperienced users, as following signal providers might be generally perceived risky due to the missing direct control of their investment activities. Considering these arguments, we propose hypothesis 5b.

H5b: The effect of risk aversion on the behavioral intention to use ST platforms will be moderated by experience, such that the effect will be stronger for less experienced potential users.

6.4 Research Design and Operationalization

As described above, the UTAUT (Venkatesh et al., 2003) forms the theoretical basis of this investigation and is adjusted to the context of ST. Additionally, we enriched the model with the variable "risk aversion". Consequently, we select the variables "performance expectancy", "effort expectancy", "advice suitability", "perceived security" and "risk aversion" as the predictors of the potential user's intention to use ST. Moreover, we include "experience" as a moderating variable into the research model. To measure the independent variables performance expectancy and effort expectancy as well as the dependent variable behavioral intention to use ST, we used the original

items of Venkatesh et al. (2003) and adjusted them to the ST context. In order to account for the specific characteristics of ST platforms, we replaced the variable social influence of UTAUT through the variable "advice suitability" of Gershoff et al. (2007). As facilitating conditions contain aspects of the platform environment "that are designed to remove barriers to use of a system" (Venkatesh et al., 2003), we identified "perceived security" to be a crucial factor in the domain of ST. We used the measurement of Cheung and Lee (2001) and Flavián and Guinalíu (2006) to evaluate "perceived security". Additionally, we included the variable "risk aversion" from the study of Donthu and Gilliland (1996). The moderator "experience" measures one's self-expressed level of understanding investments in securities and was assessed by using the items of Hadar et al. (2013). For all mentioned constructs, we used a 7-point Likert scale as this scale has been shown to reach the upper limits of the scale's reliability (Nunnally, 1978).

To ensure an appropriate understanding of ST platforms among our participants, we included a detailed description regarding the relevant aspects of ST platforms in our questionnaire. Herein, we based upon the actual description within the web and the online communication of ST providers, such as eToro and ayondo (Ayondo, 2019; eToro, 2019b). Furthermore, we illustrated and explained the entire process of searching and copying a certain signal provider by presenting screenshots of eToro with integrated textual elements. These screenshots contained partly blurred profiles of signal providers to avoid bias, excerpts of portfolios and charts with an explanation of the copy trading function. To evaluate the performance and risk of ST, surveyees received information regarding the classification criteria of signal providers. Through this scenario, we endeavored to enable the participants to see things from the actual user's perspective and afterwards be able to evaluate the questionnaire's items appropriately. In order to validate our questionnaire, we conducted an online pre-test with a sample size of 37 participants. To reach experienced traders, we used an email list of a stock exchange association in Germany as well as university employees with a background in finance. For the inexperienced group, we used acquaintances with no financial experience. Therefore, 56.8 percent of the pre-test participants were experienced in security trading and 18.9 percent had already used ST before. The participants were predominantly young (M age = 31) and male (68 percent). Five of the pre-test participants with no ST experience registered on eToro in the afterwards and evaluated the degree

to which our description and the screenshots was similar to the actual use and the copying process of the ST platform. We acquired their feedback and slightly adjusted the questionnaire and the explanation for the main survey in order to avoid uncertainties regarding an accurate understanding of the functionality of ST.

To collect data for the main survey we used an online survey, which took place from February 8th to March 4th, 2019. Our questionnaire was posted in 61 different social media groups and forums with a distinct thematic reference to securities trading. At the end of the survey period we were able to analyze 333 completed datasets. However, 4.2% of the participants in our survey had actively used ST. As we are focusing on potential users of ST platforms, we had to exclude these participants. Consequently, 319 completed questionnaires formed the basis of our analysis. 38.9 percent of the 19 to 67 year-old-participants were female and 61.1 percent were male. We noted that mainly younger people had participated in the survey. Therefore, the average age was M age = 31. Our sample shows a high educational level with 68 percent of the subjects owning a university degree. Due to the novelty of ST platforms, only 18.2 percent of our respondents knew ST. 54.9 percent of the participants had stated to be trading securities. To distinguish our groups, we calculated the mean of the variable experience $M_{exp} = 4.121$ and conducted a mean split. Consequently, 49.5 percent of our sample were categorized as rather inexperienced and 50.5 percent as rather experienced regarding previous security trading. Regarding our sample distribution, it is evident that the advertising and communication strategies endorsed by ST platforms do not only address experienced but also novice and inexperienced traders (Ayondo, 2019; eToro, 2019b). Furthermore, the young generation of "Digital Natives" (Prensky, 2001) is more likely to adopt innovative online services, including ST platforms (Doering et al., 2015). Against this background, evaluating differences between young trading-experienced and inexperienced potential consumers is a sensible approach and provides essential insights for the theory and practice.

6.5 Results

6.5.1 Measurement model

In order to evaluate the data and test our research model, we used "IBM SPSS AMOS 25" statistical software (Arbuckle JL, 2017). First off, an exploratory factor analysis

confirmed the assumed one-dimensionality of the reflective constructs. We analyzed the measurement model for each group by examining convergent validity and discriminant validity of the research variables. Convergent validity can be determined by evaluating the reliability of items, the composite reliability as well as the average variance extracted (AVE) by the constructs. Table 1 presents the assessment of the measurement model for each group as well as the values of Cronbach's alpha. All items exceeded the recommended loadings of .70 and the variables met the criteria for composite reliability of being over .8 (Nunnally, Bernstein, & Berge, 1994), for Cronbach's alpha of being over .70 (Nunnally, 1978) and the AVE of exceeding .5 (Barclay, Higgins, & Thompson, 1995). Discriminant validity evaluates the degree to which measures of different variables are distinct (Campbell & Fiske, 1959). Following the approach of Formell (1982), discriminant validity is established by showing that the AVE through one construct is greater than its shared variance with the other variables, which is measured by their squared correlations. It is equivalent to the approach of Formell to illustrate discriminant validity by showing that the square roots of the AVEs are greater than the corresponding off-diagonal inter-construct correlations (e.g., Henseler, Ringle, & Sarstedt, 2015; Lim, Sia, Lee, & Benbasat, 2006) as shown in table 2. In addition, we established discriminant validity through the heterotrait-monotrait (HTMT) criterion proposed by Henseler et al. (2015). The analysis of the HTMT criterion revealed that all HTMT values were below .85, indicating for an acceptable level of discriminant validity (Henseler et al., 2015).

Table 1. Internal reliability and convergent validity of the measurements.

Construct indicators	Inexperienced group (n=158)				Experienced group (n =161)			
	Factor loadings	Composite reliability	Cronbach's alpha	AVE	Factor loadings	Composite reliability	Cronbach's alpha	AVE
Behavioral Intention to Use (BI)								
BI 1	.935	.949	.948	.861	.982	.969	.968	.912
BI 2	.946				.975			
BI 3	.902				.906			
Performance Expectancy (PE)								
PE 1	.885	.861	.861	.756	.933	.913	.912	.840
PE 2	.854				.900			
Effort Expectancy (EE)								
EE 1	.817	.920	.920	.742	.773	.871	.867	.629
EE 2	.886				.778			
EE 3	.869				.809			
EE 4	.872				.811			
Social Influence – Advice Suitability (AS)								
AS 1	.847	.910	.904	.770	.929	.922	.916	.799
AS 2	.929				.974			
AS 3	.855				.765			
Facilitating Conditions – Perceived Security (PS)								
PS 1	.743	.885	.884	.658	.728	.891	.888	.671
PS 2	.871				.876			
PS 3	.817				.844			
PS 4	.809				.822			
Risk Aversion (RA)								
RA 1	.885	.893	.890	.736	.863	.827	.823	.616
RA 2	.861				.706			
RA 3	.826				.777			

Table 2. Inter-construct correlations and square roots of AVE.

	Inexperienced group						Experienced group					
	BI	PE	EE	AS	PS	RA	BI	PE	EE	AS	PS	RA
BI	**.928**						**.955**					
PE	.348	**.870**					.657	**.917**				
EE	.385	.318	**.861**				.050	.176	**.793**			
AS	.426	.645	.389	**.878**			.392	.411	.167	**.894**		
PS	.377	.491	.303	.482	**.811**		.182	.256	.150	.109	**.819**	
RA	-.416	-.040	-.204	-.053	-.009	**.858**	.170	.282	-.020	.105	.135	**.785**

Note: Diagonal elements in bold are the square roots of the average variance extracted

As our study aims to identify group differences between potential inexperienced and experienced users of ST platforms, we made use of a multi-group analysis approach. In order for such a comparison to be meaningful, the invariance of the measurement

variables has to be ensured. According to the approach of Steenkamp and Baumgartner (1998), we evaluated configural and metric invariance before comparing relationships between constructs across different groups. Configural invariance requires the acceptance of four conditions: First, the measurement model illustrates an acceptable fit for all groups. Second, the factor loadings are significantly and substantially different from zero. Third, the correlations between the factors should be significantly below unity and fourth, discriminant validity can be established in all groups (Steenkamp & Baumgartner, 1998).

To evaluate the measurement model's fit, we used a combination of model fit indices to reduce the risk of committing type 1 and type 2 errors as laid out in various simulation studies (e.g., Hoyle & Panter, 1995; Hu & Bentler, 1999; Sharma, S., Mukherjee, S., Kumar, A. & Dillon, 2005). Herein, Barrett (Barrett, 2007: 817) concluded that the investigation of Hu and Bentler (1999)"has essentially become the 'bible' for the threshold cutoffs by most SEM investigators." Hu and Bentler (1999) suggest combining the Tucker-Lewis Index (TLI), the Incremental Fit Index (IFI), the Comparative Fit Index (CFI) as well as the Standardized Root Mean Square Residual (SRMR) to validate the model. In sum, this combination showed the lowest risk of committing type 1 and type 2 errors for case numbers between 150 and 5000. Additionally, we included the commonly used ratio χ^2 to the degrees of freedom (χ^2/df) and the root mean square error of approximation (RMSEA).

The χ^2/df = 1.500, CFI = .970, IFI = .970, TLI = .962, RMSEA = .040 and the SRMR = .052 all exceed the recommended thresholds, indicating an acceptable model fit for both groups. All other criteria to assure configural invariance were met.

To test for metric invariance, we compared the unconstrained measurement model against a model in which we constrained all the factor loadings across groups. The difference in χ^2 between the unconstrained and the constrained model was $\Delta\chi^2$=22.82, which was significant with an increased number of degrees of freedom by Δd.f.=13. Following Steenkamp and Baumgartner (1998), we confirmed partial metric invariance instead of full metric invariance by leaving variable three of advice suitability unconstrained. Therefore, we were able to evaluate group differences between potential inexperienced and experienced users of ST.

Due to the use of a single method (online survey), we comprehensively tested for common method bias and performed three tests: The Harman single-factor test, a common latent factor test and a marker variable test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). After a first run of the tests, items 3 and item 4 of performance expectancy were affected by common method bias. As the construct is reflective, we excluded both items and all three tests achieved satisfactory results. The Harman single-factor test assumes that the presence of common method variance is indicated by the emergence of a single or general factor, which accounts for the majority of the covariance among measures (Podsakoff et al., 2003). An exploratory factor analysis without rotation illustrated that five factors were extracted with the first factor explaining only 30.17 percent of the variance, which does not account for the majority of the covariance among measures. As a second test, we integrated a common latent factor to capture the common variance among all observed variables (Podsakoff et al., 2003). The comparison of the standardized regression weights from the model without the latent factor did not show significant differences of the factor loadings compared to the model with the integrated latent factor, indicating that common method bias was not of great concern. Third, we applied the marker variable technique of Lindell and Whitney (2001). Lindell and Whitney (2001) propose the use of a theoretically unrelated "marker"-variable as a surrogate for common method variance. As the marker variable is theoretically unrelated to at least one variable in the study, the correlation between the marker and the unrelated variable reflects the level of common method variance. Consequently, it is assumed that all items within the study are constantly and similarly influenced by common method variance, which is represented by the strength of the correlational relationship between the marker variable and its corresponding theoretically unrelated variable. Under this assumption, it is possible to adjust the correlations for common method variance by partialling out the marker-correlation from all correlations of the model. Following Malhotra and Galetta (1999), we used the second-smallest positive correlation of our dataset as a more conservative estimate for adjusting our model. Therefore, the strength of the correlation between advice suitability and risk aversion of .050 acts as the marker correlation. Following Lindell and Whitney (2001), we computed the adjusted values as well as the corresponding t-values to control the impact of common method variance on the magnitude and significance of a correlation. As there were no significant differences within our data, it can be assumed that common method bias is not a great concern in our study.

6.5.2 Structural model and hypothesis test

The model fit indices mentioned above were used to validate the structural model across both groups and showed a satisfactory level. Regarding the unequal gender and age distribution across the groups, we also controlled for age and gender. Similar to the measurement model's fit, the χ^2/df = 1.509, CFI = .964, IFI = .964, TLI = .954, RMSEA = .040 and the SRMR = .052 all exceed the recommended thresholds. Table 3 summarizes the model fit indices of both models and shows the recommended values for each fit index.

Table 3. Model fit indices of the measurement and structural model.

Fit index	Measurement model	Structural model	Recommended value
χ^2/df	1.500	1.509	≤ 3.00 (Hornburg & Giering, 1996)
CFI	.970	.964	≥ .92 (Jöreskog & Sörbom, 1996)
IFI	.970	.964	≥ .90 (Bollen, 1989)
TLI	.962	.954	≥ .90 (Hornburg & Giering, 1996)
RMSEA	.040	.040	≤ .06 (Jöreskog & Sörbom, 1996)
SRMR	.052	.052	≤ .08 (Hu & Bentler, 1999)

In a first step, we tested the significance of the main effects for both groups. The analysis of the structural model reveals a significant direct effect of performance expectancy on intention for experienced potential users (H1a, $\beta = .642$, $p < .001$) but not for inexperienced potential users (H1a, $\beta = .056$, $p < .05$). Consequently, H1a can only be confirmed for the experienced group. H2a assumes a direct relationship between effort expectancy and intention and can be confirmed for the inexperienced group (H2a, $\beta = .148$, $p < .1$), but not for the experienced group (H2a, $\beta = -.066$, n.s.). Similar results are identified for the direct effect of perceived security on intention (H4a) as well as for the effect of risk aversion on intention (H5a). Herein, the analysis reveals significant results for the inexperienced group (H4a, $\beta = .193$, $p < .05$; H5a, $\beta = -.362$, $p < .001$), whereas no significant outcomes can be identified for experienced potential users (H4a, $\beta = -.011$, n.s.; H5a, $\beta = .025$, n.s.). Regarding the direct influence of advice suitability, we identified significant effects for inexperienced (H3a, $\beta = .222$, $p < .05$) as well as experienced potential users (H3a, $\beta = .170$, $p < .05$). Therefore, we find partial support for H1a, H2a, H4a and H5a and full support of H3a. However, these results strengthen the assumption of an underlying moderation.

We tested the moderating effects by using a multi-group analysis approach, as this technique considers relationships among latent constructs, which is not commonly

done by a moderated regression analysis (Homburg & Giering, 2001). We conducted a mean split (M_{exp} = 4.121) for the variable "experience" and compared a group with a comparatively high versus a low value of experience. To test for moderation, the two models need to be compared regarding their χ^2 difference as an indicator for differences regarding the model fit. Herein, the unconstrained model is compared to a model in which we constrain the parameter whose non-invariance should be tested. In general, the unconstrained model will have one degree of freedom less than the constrained model, leading to a lower χ^2 value. The question is whether this improvement is statistically significant. According to the χ^2 distribution with one degree of freedom, the moderating effect is significant at a .05 level with an improvement of more than $\Delta\chi^2$=3.84. The fit for the experienced group provides the baseline value or general model for our investigation against which we compare all subsequently specified models. Therefore, when testing for instance the moderation of experience for the effect of effort expectancy on intention, we constrain the path of effort expectancy on intention of the model for the experienced group with the corresponding path coefficient of the model for the inexperienced group. As illustrated in table 4, we were able to confirm the moderating effect of experience on the relationships between performance expectancy and intention (H1b), effort expectancy and intention (H2b), perceived security and intention (H4b) as well as risk averseness and intention (H5b). No significant moderation could be identified between advice suitability and intention, rejecting H3b. We summarized the χ^2 values and $\Delta\chi^2$ values together with the results of the direct effects in table 4.

Table 4. Summary of the hypotheses test.

Hypotheses	Path coefficient		χ^2	$\Delta\chi^2$	Supported
	Inexperienced group	Experienced group			
Experienced group (comparative model)			240.400		
H1a: PE → BI	.056 n.s.	.642***			Yes (for experienced)
H1b: PE → BI constrained	Constrained		288.929	48.529***	Yes
H2a: EE → BI	.148*	-.066 n.s.			Yes (for inexperienced)
H2b: EE→ BI constrained	Constrained		244.705	4,305**	Yes
H3a: AS → BI	.222**	.170**			Yes
H3b: AS → BI constrained	Constrained		240.467	.067 n.s.	No
H4a: PS → BI	.193**	-.011 n.s.			Yes (for inexperienced)
H4b: PS → BI constrained	Constrained		245.686	5.286**	Yes
H5a: RA→ BI	-.362***	.025 n.s.			Yes (for inexperienced)
H5b: RA→ BI constrained	Constrained		250.891	10.491**	Yes
R-square	39.8 %	48.6 %			

Note: *significant at p < .1, **significant at p < .05, ***significant at p < .001, n.s., not statistically significant

6.6 Discussion

6.6.1 Summary of the Investigation

The major research question of this study was to determine which factors predict the behavioral intention to use ST platforms and whether these factors differ between trading-experienced and inexperienced potential ST customers. Herein, we developed and empirically validated a research model based on the UTAUT of Venkatesh et al. (2003) and specified its variables for the unique characteristics of ST by making use of the social media platform categorization of Kane et al. (2014). Additionally, we included the potential user's risk aversion as a crucial variable regarding financial decision-making.

Consistent with the theory of UTAUT, we integrated the variables performance expectancy, effort expectancy, social influence and facilitating conditions. Due to the advice-based relations on ST (Ammann & Schaub, 2016; Glaser & Risius, 2018; Pelster,

2017; Pelster & Hofmann, 2018), we adjusted the variable social influence of UTAUT and used the variable advice suitability as a predictor of the intention to use ST. Contrary to the original theory of Venkatesh et al. (2003), we assumed a direct relationship between privacy-related facilitating conditions and intention to use in the context of social media platforms according to Kane et al. (2014). As ST platforms try to reach out to a broader customer base than traditional wealth management services, we established the variable experience in security trading as a moderator to examine whether the salience of the factors determining intention to use ST differs between experienced and inexperienced potential users.

The results of our investigation indicate that the antecedents of experienced and inexperienced users differ significantly. While the performance-related components, such as performance expectancy and advice suitability, dominate the prediction of the intention to use ST for experienced consumers, hurdles such as individual risk aversion, effort expectancy and perceived security mainly predict the intention to use of the inexperienced group. Advice suitability affects the potential user's intention to use ST for both groups. Surprisingly, performance expectancy did not reveal a significant effect for inexperienced individuals, whereas the variable illustrated the highest impact on intention for the experienced group. Therefore, our study supports and contradicts the results of previous investigations and offers major contributions to theory.

6.6.2 Theoretical Implications

In terms of theory building, this study is, to the best of our knowledge, the first to develop and validate a research model to explain the behavioral intention to use ST platforms from the potential customer's perspective. This is essential as previous work focused mainly on actual usage behavior on ST platforms rather than investigating the intention to use ST in order to explain the hesitant acceptance of these innovative investment platforms. Drawing upon the UTAUT, our study presents a coherent and parsimonious model to predict the intention to use ST. Particularly in the context of social media platforms, novel capabilities of digital platforms can violate the assumptions of previous theories (Kane et al., 2014). Therefore, we integrated two adjusted variables "advice suitability" and "perceived security" into the nomological structure of the original UTAUT model. Additionally, we added the potential user's "risk aver-

sion" as a complementing variable of performance expectancy. To strengthen and refine our results, we analyzed how the determinants of intention to use are moderated by prior experience with security trading. This approach ensures a theory-based model development and makes an important contribution to the emerging literature on ST.

As the developed research model is the first in the context of ST platforms, we aim to challenge the robustness of our results for each variable against the corresponding outcomes of previous investigations. Regarding performance expectancy, Tai and Ku (2013) were able to illustrate a strong impact on the intention to use mobile stock trading. This is consistent with the results of our investigations, as their respondents had an average prior experience of 11.25 years in stock trading. However, our findings provide more precise implications, which are not only valid for experienced potential users but also for inexperienced ones. We identify that less experienced traders focus more on other aspects of ST and that performance expectancy does not significantly affect their intention. This is supported by Kromidha and Li (2019), who demonstrated that actual performance indicators play a minor role for inexperienced individuals in the context of ST.

The moderation regarding the effect of effort expectancy on intention to use is even stronger than presumed, such that there are no significant main effects of effort expectancy in the model of the experienced group. These differences are consistent with the underlying theory of Venkatesh et al. (2003) and strengthen the results of the motivational model of Davis (1989), who stated that effort expectancy will be more salient in early stages of new behavior.

Interestingly, the moderation analysis does not reveal significant differences regarding the relationship between advice suitability and intention to use ST, which is salient for both groups. This confirms the adjustment of the original UTAUT for the ST context and implies that potential users of ST platforms are likely highly suitable towards financial advice. The fact that advice suitability is a significant predictor of potential users' intention to use ST might be an explanation for actual investment behavior on ST platforms, which is biased through herding effects (Gemayel & Preda, 2018b). The herding effect describes the tendency of investors behaving like a herd and occurs if they make similar decisions either intentionally by copying others' strategies or unintentionally by making investment decisions based on common information (Gemayel & Preda, 2018b). As actual users of ST might be highly suitable towards financial

advice, herding biases are strengthened on these platforms through the advice suitable community itself.

In the original UTAUT, Venkatesh et al. (2003) proposed that facilitating conditions will not be a significant predictor in the presence of effort expectancy. We specify the original variable through perceived security in our model and are able to confirm a direct effect of privacy-related facilitating conditions on the intention to use ST for inexperienced potential users. This crucial adjustment of UTAUT should be integrated to investigate the acceptance of social media platforms in general, which is supported by Kane et al. (2014).

Furthermore, risk aversion yields the strongest effect on intention to use ST for the inexperienced group, but is not significant for experienced traders, illustrating a strong moderation of prior trading experience. We also identify that performance expectancy is not significant for inexperienced potential users and significant for the experienced group. Therefore, the results regarding risk aversion and performance expectancy are indirectly proportional to each other and underline the role of risk aversion being a complementing component of expected performance (Berger et al., 2018). This indicates that experienced traders are able to select an appropriate signal provider, which matches their risk appetite (Berger et al., 2018), whereas inexperienced users might not be able to appropriately compare proposed strategies of different signal providers (Komiak & Benbasat, 2006), which increases the risk of a wrong selection. As this variable complements performance expectancy and represents a significant hurdle in financial decision-making (e.g., Guiso et al., 2013; Hoffmann et al., 2015), we suggest to include risk aversion in finance-related investigations which are based on UTAUT.

As previous research has scarcely examined the moderating role of experience (Venkatesh et al., 2016) and particularly research regarding financial services has been limited to the evaluation of the main effects (e.g., Zhou et al., 2010), our study contributes to a deeper understanding of the role of prior experience. In the field of technology acceptance, studies examined how intentions or behavior evolve over time by incorporating the user's actual experience as a moderator (Venkatesh et al., 2003). In privacy research, prior privacy-related experience was suggested to be an antecedent of the individual's privacy concerns (Smith, Dinev, & Xu, 2011). However, our findings strongly suggest that prior experience should be established as a moderator in the financial context. Therefore, we recommend future technology acceptance researchers

to consider the moderating role of prior experience in order to control or refine their results.

Our model can also be applied to broader social media-based investment contexts, such as crowdfunding platforms. ST platforms are similar to crowdfunding platforms, which facilitate the connections between companies and individual investors, who provide money in exchange for future profits or equity securities (Belleflamme, Lambert, & Schwienbacher, 2014; Mollick, 2014). Compared to ST platforms, no direct financial advice takes place. However, inexperienced users of crowdfunding can invest on the indirect advice of community-based experience or the wisdom of the crowd (Belleflamme et al., 2014), such as the invested amount of money in a company. Thus, we assume that our model can be transferred with slight adjustments to the crowdfunding context, as expected performance, effort expectancy, perceived security and risk aversion might be important antecedents. To summarize, our research model successfully extended the original UTAUT of Venkatesh et al. (2003) to account for the special characteristics of ST as a social media financial investment platform.

6.6.3 Practical Implications

The results of our study also benefit ST platform operators and signal providers by showing ways how to improve their strategies. In order to develop target-oriented recommendations, we analyzed the contents of online advertising of the three most established ST operators in Germany, namely ayondo, eToro and wikifolio. As we distinguished between more and less experienced potential customers, we are able to provide practical implications for both groups.

Performance expectancy appeared to be the most important predictor for the experienced group. However, the mean of $M_{PE\_exp} = 4.25$ of the experienced group indicates potential for improvement. We recommend to increase the signal followers' performance expectations by highlighting examples of well performing signal providers, following the example of eToro and ayondo. Additionally, platform providers could integrate results of previous research, which indicate that social trades outperform individual trades (Oehler et al., 2016; Pan et al., 2012).

Regarding effort expectancy, we noticed that eToro and ayondo strongly highlight

their platform to be very easy and intuitive to use (Ayondo, 2019; eToro, 2019a). However, effort expectancy showed the lowest impact on intention to use and was only significant for inexperienced potential users. Therefore, we advise these platform operators to better demonstrate the quality and performance of their platform, following the example of wikifolio (wikifolio, 2017).

The results of our model revealed a direct effect of advice suitability for both inexperienced and experienced potential users. This finding underlines the importance of strategy transparency, the possibility to examine the portfolio of signal providers as well as communication features of the platform (Hölscher et al., 2017). The ST platform eToro highlights its personalized social news feed, which helps the individual traders to interact with other traders of the community and to tailor-fit their trading and investment interests to received news of appropriate financial advisors (eToro, 2019a). However, the individual selection of signal providers and information is strongly biased on ST platforms and inexperienced individuals are not able to select appropriate signal providers and financial advice (Ammann & Schaub, 2016). Consequently, we recommend to base the selection systems of these platforms on relative performance-, risk- and consistency-indicators, which is consistent with Lee and Ma (2015). As the ranking of signal providers' trading strategies on ST platforms influences investment behavior of signal followers (Röder & Walter, 2019), appropriate recommendation systems are crucial instruments to reduce selection bias and improve performance.

Regarding the aspect of perceived security, we identified a negative effect among the group of inexperienced potential users. Security issues can be dampened by establishing a data protection declaration and an appropriate privacy policy within the company (Xu, Dinev, Smith, & Hart, 2008). An investigation of Xu et al. (2008) identified structural assurances through privacy policy as being a crucial factor to reduce security issues. Another approach to reduce security-related concerns is the establishment of functional cyber security systems as privacy issues and cyber security perception are correlated (Liu, Xiao, Li, Liang, & Chen, 2012). Systems ensuring data security should be certified by independent organizations (Liu et al., 2012) to increase transparency and therefore the user's trust. As ST platform operators currently do not promote this aspect appropriately within their web presence, we recommend to consider security issues within their marketing strategies.

Risk aversion showed the highest negative effect on intention to use ST among the

inexperienced group. Consequently, not every ST platform is suitable for inexperienced traders. Most of the platforms trade with CFD papers (Lesser et al., 2015) and therefore include high risks. Particularly for new signal followers, an appropriate risk-evaluation seems to be difficult (Wiegel & Lister, 2017). Hence, we recommend platform operators to explicitly mark portfolios which contain risky leverage products, following the example of wikifolio (Wiegel & Lister, 2017). This could be achieved through the provision of additional risk classification numbers (Hölscher et al., 2017) or an enhancement of the evaluation system of the signal providers (Lesser et al., 2015). Additionally, platform operators offer signal providers the possibility to charge performance dependent fees and therefore partly encourage risky behavior. A signal provider's participation on the total trading volume would help to increase publishing long term orientated trading strategies. Our study's outcomes also indicate that experience strongly moderated the effect of risk aversion on intention to use. Consequently, the possibility to open a free demo account for trading is of vital importance and consistent with the strategy of ayondo and eToro. Furthermore, experience moderates the effect of effort expectancy on intention to use. Therefore, a free demo account would also reduce the salience of the effect of effort expectancy on intention to use and is even more essential to increase the potential customer's acceptance.

6.6.4 Limitations and Further Research

Although our study provides essential insights, we had to face some limitations, which offer opportunities for further research. First, we introduced the functionality of ST in a facilitated form within our questionnaire. Thus, participants only got an impression of ST platforms whereon they built their opinions. Furthermore, one of the unique features of ST platforms is that the consumer faces a form of delegated trading, which takes place in an online environment. Particularly for online financial services, trust is of crucial importance as traditional trust building mechanisms, such as personal contact to the financial advisor rarely exist (Ba, Whinston, & Zhang, 1999; Brynjolfsson & Smith, 2000). Additionally, ST is based on a principle-agent-relationship, in which one part (the principle) assigns another part (the agent) with work, which the agent then performs (Eisenhardt, 1989), such as the delegation of trading. This leads to perceived information asymmetry and therefore uncertainty (Pavlou et al., 2007). Wohlgemuth et al. (2016) postulated the relevance of trust in signal providers in the

context of ST. As our investigation evaluates the intention to use ST for potential customers, the surveyees were not able to assess trust in a certain signal provider and the intention to follow this particular expert. However, as security and trust are closely related (Harauz, Kaufman, & Potter, 2009; Kolsaker & Payne, 2002), we were able to evaluate the potential user's trust perception towards the platform security, but not towards the signal provider. We encourage researchers to investigate different trust dimensions concerning signal providers in an experimental design.

6.7 Appendix

Variables		Items	Source
Performance expectancy (PE)	PE1	I consider social trading platforms useful to achieve a high return on my investment strategy.	Davis, 1989; Venkatesh et al., 2003;
	PE2	Using social trading platforms increases my efficiency/return regarding financial investments.	
	PE3	Social trading platforms increase my productivity regarding the search of investment information.	
	PE4	Using social trading platforms enables me to enhance my efficiency regarding financial information.	
Effort expectancy (EE)	EE1	I believe that the interactions with social trading platforms (e.g., create an account, search and find an appropriate signal provider, manage my own portfolio) is clear and understandable.	Venkatesh et al., 2003
	EE2	It is easy to become skillful at using social trading platforms.	
	EE3	I would find social trading platforms easy to use.	
	EE4	Learning to operate with social trading platforms is easy for me.	
Perceived Advice suitability (AS)	AS1	The financial advice of experienced traders would be informative for me.	Gershoff et al., 2007
	AS2	The financial advice of experienced traders would be useful for me.	
	AS3	I would integrate the financial advice of other traders into my strategy.	
Risk aversion (RA)	RA1	When making investments I prefer to be on the safe side.	Donthu & Gilliland, 1996
	RA2	Before making an investment, I have to be very sure about it.	
	RA3	I avoid risky investments.	
Perceived security (PS)	PS1	I believe social trading platform operators are doing their best to ensure my data security.	Cheung & Lee, 2001; Flavián & Guinalíu, 2006
	PS2	I think social trading networks have sufficient technical capacity to ensure my data will not be intercepted by hackers.	
	PS3	When I send data to the social trading platform, I believe that they will not be intercepted by unauthorized third parties.	
	PS4	I think the social trading platform providers have enough security measures to protect my transaction data.	
Experience (EX)	EX1	How knowledgeable do you feel about securities trading?	Hadar et al., 2013
	EX2	How well do you understand different investments (e.g., trading in equities, ETFs, leveraged products) of the securities market?	
	EX3	How comfortable will you be investing in securities?	
Behavioral Intention (BI)	BI1	I intend to use social trading platforms in the near future.	Venkatesh et al., 2003
	BI2	I plan to use social trading platforms in the near future.	
	BI3	I predict I will use the system in the near future.	

6.8 References

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