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Persuasion: An Analysis and Common Frame of Reference for IS Research

Peter Slattery

BehaviourWorks Australia, Monash University, Melbourne, Australia
peter.slattery@monash.edu

Richard Vidgen

UNSW Business School, UNSW, Sydney, Australia and
School of Business, Economics and Informatics,
Birkbeck University, UK

Patrick Finnegan

UNSW Business School, UNSW, Sydney, Australia

Abstract:

Information Systems (IS) researchers persistently examine how Information and Communications Technology (ICT) changes attitudes and behaviours but rarely leverage the persuasion literature when doing so. The hesitance of IS researchers to leverage persuasion literature may be due to this literature's well-documented complexity. This study aims to reduce the difficulty of understanding and applying persuasion theory within IS research. The study achieves this aim by developing a common frame of reference to help IS researchers to conceptualise persuasion and to conceptually differentiate persuasion from related concepts. In doing this, the study also comprehensively summarises existing research and theory and provides a set of suggestions to guide future IS research into persuasion and behaviour change.

Keywords: Persuasion, Behaviour Change, Influence, Information Systems, Communication, Conceptualisation

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1 Introduction

In recent years, there has been a surge of interest in using *behavioural insights*, *nudges*, and *choice architectures* to create more flourishing societies by changing attitudes and behaviours (Thaler, 2016; Thaler & Sunstein, 2008). In a report by the Institute for Government, a UK thinktank, Dolan, Hallsworth, Halpern, King, and Vlaev (2010) argue “many of the biggest policy challenges we are now facing – such as the increase in people with chronic health conditions – will only be resolved if we are successful in persuading people to change their behaviour, their lifestyles or their existing habits. Fortunately, [...] our understanding of influences on behaviour has increased significantly and this points the way to new approaches and new solutions” (p. 4). Similarly, Steven Emmott, Professor of Computation at the University of Oxford and Head of Microsoft’s Computation Science Laboratory in Cambridge, UK, argues in a piece in the Guardian newspaper that: “we are in a desperate situation and I don’t think people realise [...] Radical behaviour change is what is really needed. Our problems are not just those concerned with carbon emissions. There are so many other things – overfishing, destroying habitats and eradicating species – that we need to change” (McKie, 2012).

Behaviour change initiatives frequently rely on Information and Communications Technology (ICT) (Oinas-Kukkonen, 2010; Oinas-Kukkonen & Chatterjee, 2009). ICT has incredible reach; as Tristan Harris points out, “technology steers what 2 billion people are thinking and believing every day... It’s possibly the largest source of influence [...] that has ever been created” (Thompson, 2017). ICT may also amplify the power of mass persuasion by making it easier to tailor messages to be more persuasive to their receivers. As Kosinski, Stillwell, and Graepel (2013) argue, ICT platforms allow us to understand people deeply, perhaps even better than they understand themselves. They found that “on the basis of an average of 68 Facebook [likes] by a user, it was possible to predict [...] skin color [...] sexual orientation [...] affiliation to the Democratic or Republican party [...] Intelligence, religious affiliation, as well as alcohol, cigarette and drug use [...] Seventy [likes] were enough to outdo what a person’s friends knew, 150 what their parents knew, and 300 [likes] what their partner knew. More [likes] could even surpass what a person thought they knew about themselves” (Grassegger & Krogerus, 2017, para. 13-14).

As these examples show, ICT allows for increasingly persuasive information to be selectively (and privately) delivered to those it will most likely influence, over any geographical distance, at virtually no cost, and almost instantly. Those who understand and control ICT can therefore increasingly determine what behaviours it will drive in the masses that use it, for example, what sort of vote their viewers will cast, the products they will purchase, or the information they will consume. Already, it has been widely speculated that this power may have contributed to the selection of the most powerful leader in the world, the president of the United States (Grassegger & Krogerus, 2017).

The result of these trends has been widespread recognition of the power of ICT-driven behaviour change, both for good and for bad, and repeated calls from academics to better understand it (e.g., Corner, Kane, & Owen, 2014; Morozov, 2011b; Niedderer, Clune, & Ludden, 2018; Spotswood, 2016). Information Systems (IS) research is well-positioned to help answer these calls as it examines “the effective design, delivery, use and impact of information [and communication] technologies in organizations and society” (Avison & Fitzgerald, 2003, p. xi). Though IS has traditionally examined the role of ICT in organisational and business-related behaviour (Avison & Elliot, 2006), it now examines behaviour change more widely, for instance, in social, health, and societal contexts (e.g., Flüchter & Wortmann, 2014; Kelders, Kok, Ossebaard, & Van Gemert-Pijnen, 2012; Krebs, Prochaska, & Rossi, 2010; Lehto, Oinas-Kukkonen, Pätäälä, & Saarelma, 2012; Neville, O’Hara, & Milat, 2009; Reed, Schifferdecker, Rezaee, O’Connor, & Larson, 2012; Van Den Berg, Schoones, & Vlieland, 2007; Walsham, 2012; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004).

The IS discipline is becoming “the core of research” into ICT-enabled attitude and behaviour change (Harjumaa & Muuraiskangas, 2013, p. 23). A strong research stream exists within persuasive technology and persuasive systems design (Oinas-Kukkonen & Harjumaa, 2009; Toring & Oinas-Kukkonen, 2009) and there has been a special edition on persuasion through technology in the Communication of the Association of Information Systems (Oinas-Kukkonen & Chatterjee, 2009). However, despite all of this, IS researchers rarely engage with the literature and theory that describe and explain the process of changing attitudes and behaviours. Perhaps most significantly, IS researchers rarely engage with the concept of persuasion, the oldest (cf. Golden, 1989) and arguably broadest, field of research examining attitude and behaviour change (cf. Gass & Seiter, 2011; Perloff, 2003).

This is problematic for at least two reasons. First, it may affect the quality of IS research: IS researchers who overlook relevant theory from persuasion research are likely to be less well-equipped to explain how ICT influences attitude and behaviour change. Second, it may affect the diffusion and social impact of IS research: IS studies which omit explicit mention of persuasion or relevant persuasion theory lack salient links with on-going persuasion research in other fields and may therefore be excluded from relevant scientific dialogue, including the important discussion of where and how technology should be used to change behaviour.

The lack of IS research that draws on the concept of persuasion may be due, in part, to the difficulty of understanding and applying persuasion as a concept. The research literature on persuasion is vast, complex, and highly contested (Seiter & Gass, 2004). However, in contrast to other multifaceted concepts such as 'affect' (Zhang, 2013), 'culture' (Leidner & Kayworth, 2006), 'agility' (Conboy, 2009), and 'privacy' (Bélanger & Crossler, 2011; Pavlou, 2011; H. Smith, J., Dinev, & Xu, 2011), IS researchers lack a conceptual reference paper for persuasion. Furthermore, such a reference paper does not appear to exist outside of IS. Indeed, the concept of persuasion is so inconsistently used that even persuasion scholars acknowledge a need for "a re-examination of how persuasion should be defined and conceptualized" (Seiter & Gass, 2004, p. 16).

The difficulty of understanding and applying persuasion as a concept may also have other negative implications for its usefulness within research. It has been argued that conceptual clarity is essential for good research, that confidence in any scientific discipline is roughly proportional to that discipline's ability to formulate its concepts precisely (Bronowski & Mazlish, 1960) and that "the most fruitful research programs [...] are those in which the key concepts are agreed on and defined the same way by all" (Mueller, 2004, p. 62). In support of these claims, research suggests that conceptual imprecision can impede and impair a concept's usage (Marcolin, Compeau, Munro, & Huff, 2000; McKnight & Chervany, 2001), for example by reducing researchers' ability to compare results across studies (Lustria, 2007), develop cumulative bodies of knowledge (Marcolin et al., 2000), and evolve the concept (McKnight & Chervany, 2001; Scallen, 1995).

Creating a *common frame of reference* is one way to increase the conceptual clarity of persuasion and reduce the challenge of understanding and applying it within IS research. A common frame of reference integrates streams of research into a reference source to make it easier for interested parties to understand and build on them (e.g., Davis, Bagozzi, & Warshaw, 1989; Scholten, 1996). As Davis et al. (1989) argue, when a concept is used in a diverse and inconsistent manner, "research progress may be stimulated by the establishment of an integrating paradigm to guide theory development and to provide a common frame of reference within which to integrate various research streams" (p. 983). Similarly, Scholten (1996) notes that where concepts are "characterized by great detail and diversity of theoretical, methodological, and technical approaches" (p. 97), a common frame of reference can benefit researchers and practitioners by clarifying the concept in question.

Accordingly, in response to calls for IS researchers to engage in more conceptual development (e.g., Benbasat & Zmud, 2003), the objective of this study is to develop a common frame of reference for using the concept of persuasion in IS research. We do this by identifying relevant documents across the persuasion and IS literature, searching their text for variants of the term "persuasion", and extracting and comparing related definitions and models. Our common frame of reference is not intended to be a 'stick to beat' researchers with, nor a straitjacket for how IS research should progress in using the concept of persuasion. Rather, it is intended to be an accessible guide that researchers can consider and contest when framing relevant research, one that balances the need for concepts to be uniformly understood (see Mueller, 2004) with the natural variety of theory that is inherent in a discipline that draws from multiple reference domains (see Avison & Elliot, 2006).

2 Research approach and methodology

To determine how to develop a common frame of reference, we reviewed many examples of conceptual development (e.g., Alavi & Leidner, 2001; Bassellier, Reich, & Benbasat, 2001; Boyd & Ellison, 2007; Collier & Levitsky, 1997; Foxman, Berger, & Cote, 1992; Gable, Sedera, & Chan, 2008; Greenberg, 1985; Schwarz & Chin, 2007). Based on these, we follow a basic three-step process: i) introduce and explain the concept of persuasion, ii) compare the concept's use across disciplines, and iii) use this comparison to outline a common frame of reference for future use. We start by explaining the concept of persuasion. Section 3 discusses our interpretation of the term *concept*, and terms and techniques for understanding concepts. Section 4 explains our methodology by discussing the method, scope, and aim of each of our

two literature searches. Section 5 reports on the first literature search, which aimed to explain how the persuasion literature uses the concept of persuasion. Section 6 reports on the second literature search, which aimed to explain how a typical case sample of relevant IS literature uses the concept. In Section 7 we use a detailed comparative analysis across our samples to compare how the persuasion literature and a *typical case* IS sample use the concept of persuasion. Section 8 builds on our findings from searching and reviewing the IS and persuasion literature to suggest recommendations for future research. Finally, in Section 9 we summarise these recommendations in a common frame of reference for future IS research on persuasion.

2.1 Concepts and how to understand them

A *concept* is a category of phenomena (e.g., Bulgren, Lenz, Schumaker, Deshler, & Marquis, 2002; Evermann & Fang, 2010; Margolis, 1994). Concepts are expressed with definitional structures (e.g., models or definitions). These provide necessary and sufficient criteria for a phenomenon to be categorised within that concept (Mueller, 2004). Researchers generally use two types of techniques to create and compare definitional structures: conceptualisation and conceptual differentiation. As shown in Figure 1, *conceptualisation* involves outlining definitional structures (e.g., models and definitions) to explain the set of phenomena that a concept includes (Mueller, 2004). In contrast, *conceptual differentiation* involves determining what phenomena a concept excludes by comparing its definitional structures against the definitional structures of concepts that are similar to it (Greenberg, 1985; C. Smith, Carey, & Wisner, 1985). For the purposes of this research, we refer to concepts that are similar to persuasion in usage and meaning as *related concepts*.

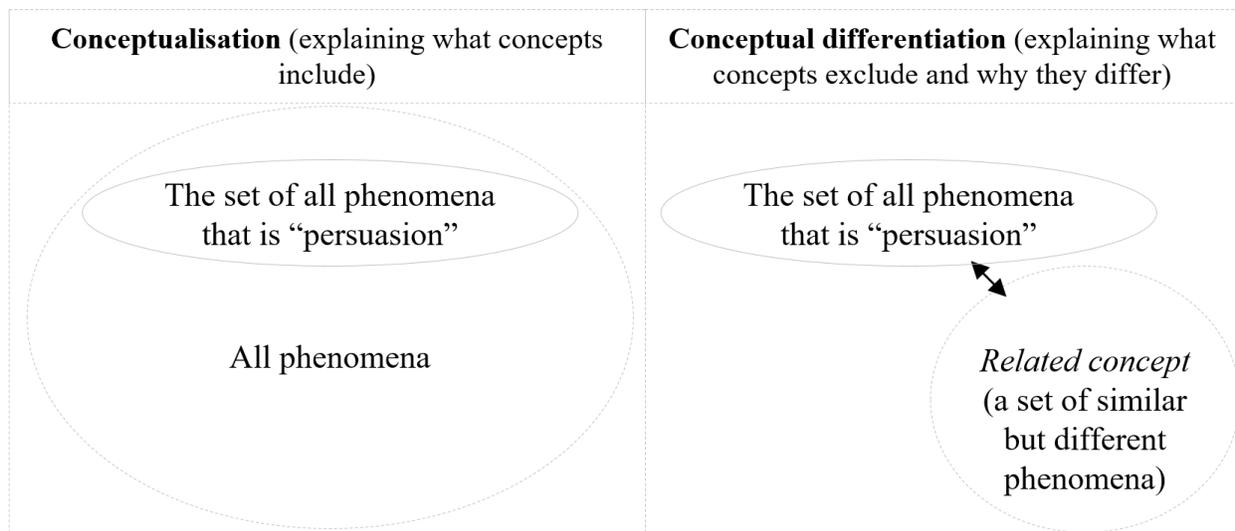


Figure 1. Approaches to understanding concepts

Creating and comparing definitional structures involves reference to several types of concepts. To conceptualise a concept, you must consider both the concept you are interested in and the concepts that help to explain what that concept means. To differentiate a concept, you must also consider the concepts being differentiated from your concept of interest. Two terms are commonly used for labelling and categorising different types of concepts: components and conceptual hierarchies. Components refer to concepts that are used to explain the nature of a larger concept (cf. Eulau & Karps, 1977; McCullough, 2006). For the purpose of this research, we define a *component* as a category of phenomena that can be invoked to explain a larger concept. Researchers use the term *conceptual hierarchies* to explain how concepts are subsumed by other concepts (cf. L'Etang, 2006; Yang, 2012). Three levels of conceptual hierarchy are commonly referenced: *sub-concepts* (concepts that are subsumed by other concepts), *synonyms* (concepts that are interchangeable), and *super-concepts* (concepts that subsume other concepts). See Figure 2 for an illustration of the relationships between these terms.

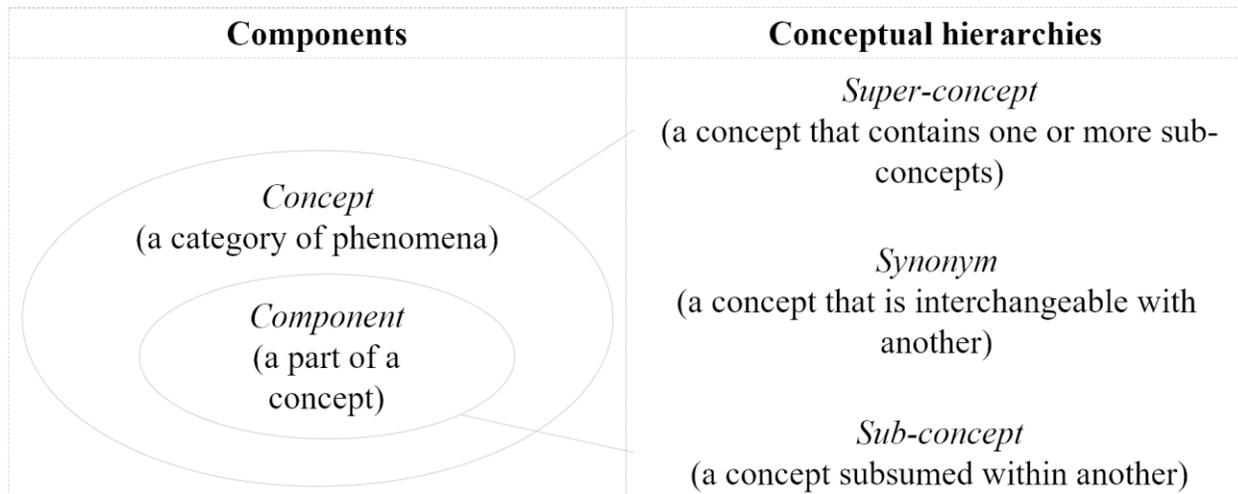


Figure 2. Components and conceptual hierarchies

Academics in different disciplines often use concepts in slightly different ways (McKnight & Chervany, 2001). Accordingly, a final technique that researchers use to understand concepts is to explore the variance across individual authors and disciplines in the definitional structures they use to explain concepts (e.g., Conboy, 2009). Doing this helps researchers to understand how differences in authorship and discipline affect a concept's usage.

2.2 Methodology

We start by explaining the *entities of interest* (cf. Albert et al., 2003; Michelson & Macskassy, 2010) that we looked for when searching the persuasion and IS literature. We then explain the methodology we used for each of our literature searches. Finally, we explain how we assessed the literature we collected.

2.2.1 Entities of interest

Our *entities of interest* emerged from the approach for understanding concepts that we previously outlined. To analyse conceptualisation practices across the IS and persuasion literature, we looked for two forms of definitional structures: i) *models*, i.e., theories, frameworks, and formalised explanations of concepts, and ii) *definitions*, i.e., "exact statement[s] or description[s] of the nature, scope, or meaning of something" (Oxford Dictionary, 2015). We also looked for *definitions of components of concepts* to evaluate if the components used within studies' definitional structures were collectively consistent. To analyse conceptual differentiation practices, we looked for *related concepts* that were used alongside persuasion. Finally, to analyse how concepts differ across authors and disciplines, we noted the disciplines of researcher(s) who proposed definitional structures.

2.2.2 Hermeneutic literature search process across the persuasion literature

We used a hermeneutic search process to develop a sample of persuasion literature. A hermeneutic search process was appropriate as we expected that our search strategy would evolve based on the literature that we read. Additionally, when we started our literature search it was unclear which entities (e.g., specific models of persuasion) and specific search domains (e.g., journals and conferences) were of most interest. Our hermeneutic search methodology was based on Boell and Cecez-Kecmanovic (2010) and involved seven steps: (i) searching for literature, (ii) sorting it for relevance, (iii) selecting the content of interest, (iv) acquiring this content, (v) reading it, (vi) identifying new areas to investigate, (vi) refining the search process, and (vii) searching again.

The *entry point* into our search process was a set of authoritative books on persuasion (Cialdini, 2009; Dillard & Pfau, 2002; Fogg, 2003; Gass & Seiter, 2011; Lunsford, Eberly, & Wilson, 2009; O'Keefe, 2015; Perloff, 2003; Reeves & Nass, 1996; Stiff & Mongeau, 2003). After sorting, selecting, acquiring, and reading these initial texts, we used them to identify further areas to investigate. Our criteria for saturation (cf. Combs, Bustamante, & Onwuegbuzie, 2010; Finfgeld-Connett & Johnson, 2013; Levy & Ellis, 2006) was diminishing novelty: the point when the main content has been previously identified and read.

Accordingly, our search concluded when we identified that new texts were referencing literature that we had already read.

2.2.3 Systematic literature search process across the IS persuasion research

We used a systematic process to develop a *typical case* (cf. Patton, 2002) sample of IS literature examining persuasion. A systematic search process was appropriate because our hermeneutic search had identified entities (e.g., specific models of persuasion) that we could use as search terms. Further, a systematic search process was feasible as we were searching within a single academic field (i.e., IS), and could therefore set a specific search domain (e.g., relevant IS journals and conferences) prior to beginning the search.

For our search domain, we included articles published in the 53 IS journals ranked as A or A* in the Australian Council of Professors and Heads of Information Systems (ACPHIS) ranking system. These articles are typical of IS research and include all journals publications valued by influential international rankings such as the Association of Information Systems (AIS) Senior Researchers' basket of eight, and the Association of Business Schools (ABS) rankings. Additionally, we included articles published at three conferences: the International, European, and Pacific Asia IS conferences. These are among the largest and most prestigious of IS conferences and their proceedings are reflective of typical IS research (e.g., ACIS, 2014; CORE, 2014). Appendix A shows a full list of sources, including individual journal names.

We used the Scopus online database to retrieve relevant articles. To do this, we searched for *persu** within the database fields of 'Article Abstract', 'Title', and 'Keywords'. As an asterisk (*) denotes a wildcard, this search term returned all mentions of any grammatical variant of persuasion (e.g., persuasion, persuade, persuasive, persuading). Appendix B shows the exact search strings used.

Our search returned 186 articles. These were downloaded and analysed to ensure that they met with all of our inclusion criteria. At this point we removed articles that i) didn't use the concept of persuasion in some substantive and relevant capacity, ii) were not from sources in our predetermined list of accepted source outlets and iii) were neither research articles nor reviews. The 100 studies that remained were chosen as a *typical case* sample of IS literature that was considered to be representative of general IS research on persuasion.

2.2.4 Literature evaluation process

We evaluated the persuasion literature throughout our hermeneutic search. This involved comparing relevant articles and taking notes on entities of interest (i.e., models, definitions, components, and related concepts) that we encountered. We evaluated the *typical case* IS sample after completing our systematic search. First, we searched within each of the 100 articles collected for the term *persua** to identify all grammatical variants of persuasion (e.g., persuasion, persuade, persuasive, persuading). This enabled us to identify and record models and definitions of persuasion, in addition to definitions of components of persuasion. We then examined all records to explore if authors and disciplines used persuasion in different ways. To do this we identified definitions of persuasion, then checked the associated citation to identify the scholars cited and their disciplinary affiliations. We explored how related concepts were used by searching each of our articles for the relevant terms (e.g., rhetoric). Finally, we evaluated how frequently our sample mentioned each entity of interest by recording the number of articles returned when we searched for it across all 100 articles.

3 Explaining persuasion

This section discusses our findings from searching the persuasion literature. In doing this, we provide an overview of the approaches that we identified for i) modelling and defining persuasion, ii) defining components of persuasion, and iii) differentiating persuasion from related concepts.

3.1 How persuasion is modelled

Persuasion researchers generally model persuasion as either a process of i) communication or ii) information processing (Eagly, 1987; Kruglanski & Thompson, 1999; Stiff & Mongeau, 2003). Figure 3 outlines both types of model and the general variables that each tends to focus on.

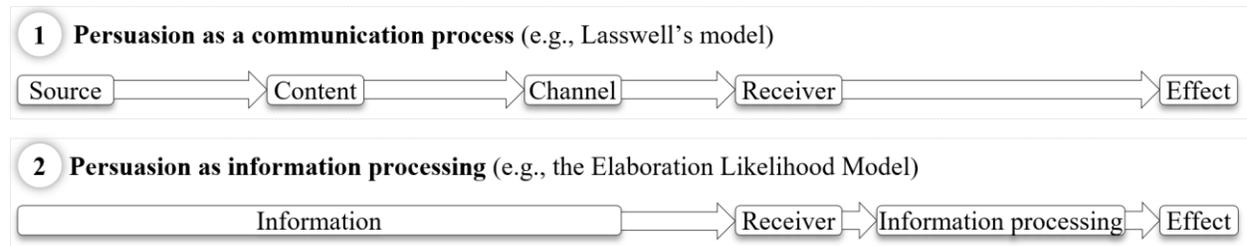


Figure 3. Summary of different persuasion processes

Persuasion researchers use communication models to assess how changing variables within a communication process will influence *effect variables* such as attitudes and behaviours (cf. McGuire, 1985). As shown in the upper part of Figure 3, communication models of persuasion generally break the persuasion process into a number of communication variables (e.g. Lasswell, 1948; McGuire, 1972; Shannon & Weaver, 1949). The variables shown in Figure 3 - source, content, channel, receiver and effect - are from arguably the most commonly-used communication model, Lasswell's (1948) model.

Persuasion researchers use information processing models to assess how peoples' information processing mediates the impact of that information (Eagly, 1987). Information processing models of persuasion generally follow the structure outlined in the bottom of Figure 3, breaking the persuasion process into four variables: *information*, which reaches a *receiver* who engages in *information processing* leading to an *effect* on their attitude or behaviour (cf. Kruglanski & Thompson, 1999). Two types of information processing models exist: single-route and dual-route. Dual-route models propose that *information processing* occurs in two qualitatively different ways (described as routes). One route occurs when an individual processes the information rapidly and superficially. The other route occurs when an individual processes the information slowly and more comprehensively. The *Elaboration Likelihood Model* (R. Petty, E. & Cacioppo, 1986) and *Heuristic Systematic Model* (Chaiken, 1980) are arguably the most well-known dual route models. In contrast, single-route information processing models, such as the *Unimodel* (Kruglanski et al., 2006; Kruglanski & Thompson, 1999), posit that information processing occurs on a single continuum ranging from high to low and that there are no qualitative differences between different levels of processing.

3.2 How persuasion is defined

Scholars of persuasion broadly argue that persuasion involves communication focused on changing attitudes and behaviours (Perloff, 2003). However, the scholars of persuasion also differ in the qualities that they ascribe to persuasion (Koballa Jr, 1992). For instance, O'Keefe (2015) argues that persuasion is *intentional, non-coercive communication* that is *effective* at causing a *change in mental state* leading to a *change in behaviour*. Perloff (2003) agrees with O'Keefe (2015) that persuasion is *intentional* and *non-coercive*. However, he disagrees that persuasion has to be *effective*. Stiff and Mongeau (2003) agree with Perloff (2003) in arguing that persuasion is *intentional*, but not always *effective*. However, they differ from Perloff (2003) in arguing that persuasion is not clearly or easily differentiable from *coercion*.

In the most comprehensive definitional analysis that we identified, Seiter and Gass (2004) differentiated definitions of persuasion based on how they position the concept across six dimensions¹. They treat each dimension as having a *pure* (included in the majority of definitions) or *borderline* (included in a minority of definitions) pole. In Figure 4, we provide an illustration of these dimension, and in Table 1 we summarise each pole of each dimension.

¹ Seiter and Gass (2004) outlined five dimensions. However, their *free choice/awareness vs. coercive/unaware* dimension appeared to combine two different dimensions. Accordingly, we split this dimension into two separate dimensions here.

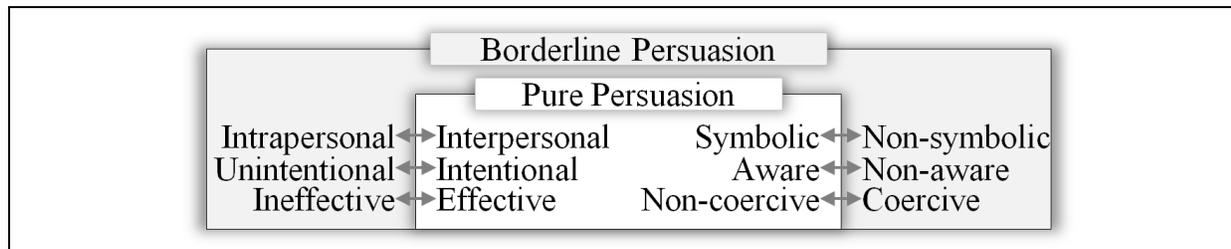


Figure 4. Pure and borderline persuasion

Table 1. Pure and borderline persuasion

Pure pole	Borderline pole
<i>Interpersonal</i> <	> <i>Intrapersonal</i>
Persuasion must be interpersonal, i.e., involve a minimum of two people (e.g., Perloff, 2003).	Persuasion is also intrapersonal as you can persuade yourself (e.g., Virtanen & Halmari, 2005).
<i>Intentional</i> <	> <i>Unintentional</i>
Persuasion must always be intentional (e.g., Perloff, 2003).	Persuasion can be unintentional, for example, by being overheard unknowingly (e.g., Gullede, 2004).
<i>Effective</i> <	> <i>Ineffective</i>
Persuasion does not occur unless an attempt at persuasion is effective (e.g., O'Keefe, 2015).	Persuasion attempts are still persuasion as persuasion is a process rather than a product of a process (e.g., Ifert & Gibbons, 1999).
<i>Non-coercive</i> <	> <i>Coercive</i>
Persuasion is always non-coercive and involves free choice for the receiver (e.g., Perloff, 2003).	Persuasion can involve some element of coercion (e.g., Hundleby, 2013).
<i>Aware</i> <	> <i>Non-aware</i>
Persuasion is limited to where the person being persuaded is aware they are being persuaded (e.g., Perloff, 2003).	Persuasion can still occur when people are not aware it is occurring (e.g., Dijksterhuis, Aarts, & Smith, 2005).
<i>Symbolic</i> <	> <i>Non-symbolic</i>
Persuasion is limited to symbolic expression such as language and action (e.g., Miller, 2002).	Persuasion includes forms of expression, such as nonverbal cues and pictures (e.g., Higdon, 2008).

Based on their analysis, Seiter and Gass proposed that persuasion, in its broadest sense, “involves one or more persons who are engaged in the activity of creating, reinforcing, modifying, or extinguishing beliefs, attitudes, intentions, motivations, and/or behaviours within the constraints of a given communication context” (Gass and Seiter 2011, p. 33).

3.3 How components of persuasion are defined

Our literature search suggests that Lasswell's model is commonly used to outline components of persuasion (e.g., Haugtvedt & Wegener, 1994; McGuire, 1985; R. E. Petty, Brinol, & Priester, 2009). For example, McGuire (1985) argues that Lasswell's “communication input variables are the components out of which the practitioner constructs his or her persuasion campaign and are the attitude change hypotheses' independent variable which the researcher can manipulate to test theories” (p. 258). Overall this evidence suggests that, within the persuasion literature, the components of persuasion are generally defined and differentiated through reference to the uniqueness of the source, content, channel, recipients or effects that they focus on (or some combination of these variables).

3.4 How persuasion is conceptually differentiated from related concepts

Perhaps as a partial consequence of the inconsistency in how persuasion is defined (Seiter & Gass, 2004), we did not find any attempt to explore or standardise how persuasion and related concepts might be differentiated. While we identified several cases where authors differentiated persuasion from one or more related concepts as part of discussing persuasion (e.g., Koballa Jr, 1992; Perloff, 2003), we did not identify any rigorous attempt to explore or standardise how persuasion and related concepts were differentiated. Our literature search therefore suggested that persuasion is most commonly differentiated on a small-scale case-by-case basis, rather than being differentiated through reference to systematic research drawing on well-accepted sources.

4 How the typical case sample of IS research used persuasion

4.1 How persuasion was modelled

Our search across the typical case sample of IS research found three different models of persuasion, all of which were also mentioned in the persuasion literature (see Appendix C for details): the Elaboration Likelihood Model was most prevalent (36 out of 100 articles); one article used Lasswell's model; and three studies mentioned the Heuristic-Systematic Model, although none operationalised it within their study. We did not identify any studies that utilised a single-route model of persuasion such as the Unimodel.

4.2 How persuasion was defined

Our search across the typical case sample identified 13 definitions of persuasion. The left column in Table 2 contains definitions, pages numbers, and authorship information. The right column contains information on the author(s) cited for the definition and their discipline. We used *none* where no citation was provided.

Table 2. Definitions of persuasion within the IS typical case sample

Definition given	Source discipline (author)
"a communication process whereby the communicator seeks to influence behaviour, change attitudes and beliefs, or otherwise cause acceptance of a new cognitive state in an area where the person being persuaded has some measure of freedom" (Morrison & Vogel, 1998, p. 126)	Communication (Andersen, 1971)
"occurs when a potential adopter forms a favourable or unfavourable attitude towards and (sic) innovation" (Papazafeiropoulou, Gandechea, & Stergioulas, 2005, p.5)	Communication (Rogers, 1995)
"a process through which one skillfully and ethically uses logical thoughts, appeals, credibility, and ethical proof to influence and motivate others to respond as one wishes" (Huang, Lin, & Yuan, 2006, p. 85)	Communication (Ross, 1990)
"when an individual (or some other decision-making unit) forms a favorable or unfavorable attitude towards the innovation" (Y. Li & Lindner, 2007, p. 85)	Communication (Rogers, 1995)
"non-coercively changing an individual's attitudes or behaviour" (Steiny, 2009, p. 474)	None
"persuasion is defined as the modification of a private attitude or belief resulting from the receipt of a message" (Angst & Agarwal, 2009, p. 346)	Psychology (Kenrick, Neuberg, & Cialdini, 2005)
"human communication designed to influence the autonomous judgments and actions of others" (Oinas-Kukkonen & Harjumaa, 2009, p. 486)	Communication (Simons, Morreale, & Gronbeck, 2001)
"a deliberate attempt to change attitudes and/or behaviors" (Chatterjee & Price, 2009, p. 172)	Persuasive technology (Fogg, 2003)
"a form of attempted influence in the sense that it seeks to alter the way others think, feel, or act" (Yu, Benbasat, & Cenfetelli, 2011, p. 2)	None
"an active attempt to influence people's action or belief by an overt appeal to reason or emotion" (G. Lee & Xia, 2011, p. 289)	None
"[An] argument that attempts to explain reasons, or presents information in support of a position. Includes (but not limited to) the use of logical arguments, factual evidence, and statements of 'expertise' (i.e., Because that's the nature of things)" (Prentice, Taylor, Rayson, Hoskins, & O'Loughlin, 2011, p.65)	None
"the attempt to guide people toward the adoption of some behavior, belief, or attitude preferred by the persuader through reasoning" (Xu, 2012, p. 5)	Management (Reardon, 1981)
"the presentation of an inappropriate request using the technique of appealing to emotions" (Tetri & Vuorinen, 2013, p. 1018)	None

As Table 2 shows, only a subset of the 13 IS studies that defined persuasion also used citations to justify their definition. Multiple fields and researchers were cited, particularly from the field of communication. Most articles that defined persuasion broadly aligned in implying that persuasion involves cognitive and/or behaviour change but differed in the other requirements they specified. Many studies conceptualised persuasion quite differently from the broad definition given in the persuasion literature. For example, Tetri and Vuorinen (2013) argued persuasion is simply an "inappropriate request using the technique of appealing to emotions", while Huang et al. (2006) suggested it is "a process through which one skillfully and ethically uses logical thoughts, appeals, credibility, and ethical proof to influence and motivate others to respond as one wishes" (p. 85).

4.3 How components of persuasion were defined

Our search identified 37 definitions of *components* of persuasion (see Appendix C for all 37 definitions, indexed by paper). Studies within the typical case sample defined certain components of persuasion consistently (e.g., persuasive technology and persuasive systems). However, they defined other components inconsistently. For instance, *persuasive messages* were defined in three inconsistent ways: i) “message behavior(s) directed toward a recipient [...] that have the deliberate intention of altering the recipient’s attitudes and/or behaviors toward an issue (Prentice et al. 2011, p. 62), ii) “a dynamic external influence process” (Li and Ku 2011, p. 2), and iii) “messages that implement persuasion principles” (Kaptein and Van Halteren 2013, p. 1174).

4.4 How persuasion was conceptually differentiated

IS studies used five related concepts alongside persuasion. Table 3 lists the names of these concepts, a sample definition and the number of articles (within the 100 in our typical case sample), that mentioned them; Appendix C shows which specific articles mentioned each related concept. Studies within the typical case sample were inconsistent in how they differentiated persuasion from these related concepts. For example, some studies (e.g., Bentahar & Labban, 2011; M. Feinberg, 2011) used *rhetoric* as a super concept that appeared to subsume persuasion, while other studies (e.g., Berdichevsky & Neunschwander, 1999) used *rhetoric* as a sub-concept subsumed by persuasion. Similarly, *influence* was used as a super-concept for persuasion (e.g., Johnston & Warkentin, 2010), but also as a synonym (e.g., Bhattacharjee & Sanford, 2006) and a sub-concept (e.g., Comber & Thieme, 2013).

Table 3. Related concepts used alongside persuasion within the typical case sample (100 articles)

Concept	Definition	Articles
Influence	“the change in one’s attitudes, behavior, or beliefs due to external pressure that is real or imagined” (Guadagno & Cialdini, 2005, p. 4)	95
Rhetoric	“the study of how people use language and other symbols to realize human goals and carry out human activities” (Bazerman, 1988, p. 6)	12
Coercion	“forcing people to act as the coercer wants them to act, and presumably contrary to their preferences” (J. Feinberg, 1998, p. 387)	12
Compliance gaining	“the performance by one person, the target, of the specific behaviors desired of the target by another person, the agent” (Wheless, Barraclough, & Stewart, 1983, p. 110)	2
Propaganda	“persuasive communication with which one disagrees and to which the individual attributes hostile intent” (Perloff, 2003, p. 18)	2

5 Comparing the IS and persuasion literature

5.1 Comparing how persuasion is modelled

Our examination of the persuasion literature identified that Lasswell’s model and the Elaboration Likelihood Model are compatible models of persuasion that examine different aspects of the persuasion process. Examination of the typical case sample of IS literature found that both models were operationalised within IS research. Accordingly, our findings suggested that where the sample of IS literature modelled persuasion, it did so in alignment with the persuasion literature.

5.2 Comparing how persuasion is defined

We conducted two analyses to compare how the IS typical sample and the persuasion literature defined persuasion. After their comprehensive analysis of the persuasion literature, Seiter and Gass (2004) noted that most definitions of persuasion argue that it is *interpersonal*, *intentional*, *effective*, *symbolic*, *aware*, and *non-coercive*. To assess if the 13 definitions identified within the IS sample followed a similar approach to defining persuasion, we explored if these definitions agreed with the criteria outlined by Seiter and Gass (2004). The symbols (+/-) in a criteria column indicate whether the IS definition on that row agrees or disagrees with the *pure persuasion* criteria that Seiter and Gass (2004) suggest. For instance, a (+) symbol in the *effective* column implies that the IS definition agrees with that *pure persuasion* criterion and conceptualises persuasion as only involving successful attempts at attitude/behaviour change. In

contrast, a (-) symbol in the *effective* column indicates that the IS definition disagrees with the *effective* criterion and conceptualises persuasion as involving both successful and unsuccessful attempts at attitude/behaviour change. A blank in the *effective* column implies that the IS definition does not specify effectiveness related criteria for persuasion (i.e., it does not state whether persuasion must be effective or otherwise). We also compared the IS definitions against the broad definition of persuasion that Gass and Seiter (2011) suggest. Based on their analysis, Seiter and Gass proposed that persuasion, in its broadest sense, “involves one or more persons who are engaged in the activity of creating, reinforcing, modifying, or extinguishing beliefs, attitudes, intentions, motivations, and/or behaviours within the constraints of a given communication context” (Gass and Seiter 2011, p. 33). Our analysis is shown in Table 4.

Table 4. Analysing the definitions of persuasion in IS research

IS Definition	Criteria met					Difference from S&G definition	
	Interpersonal	Intentional	Effective	Symbolic	Aware Non-coercive		
“a communication process whereby the communicator seeks to influence behaviour, change attitudes and beliefs, or otherwise cause acceptance of a new cognitive state in an area where the person being persuaded has some measure of freedom” (Morrison & Vogel, 1998, p. 126)		+	-			+	Implies persuasion is only intentional and non-coercive.
“occurs when a potential adopter forms a favourable or unfavourable attitude towards and (sic) innovation” (Papazafeiropoulou et al., 2005, p.5)				+			Implies persuasion must be effective and appears to limit persuasion to attitudes toward an innovation.
“a process through which one skillfully and ethically uses logical thoughts, appeals, credibility, and ethical proof to influence and motivate others to respond as one wishes” (Huang et al., 2006, p. 85)	+		+			+	Implies persuasion is interpersonal, effective, and non-coercive and limited to “logical thoughts, appeals, credibility, and ethical proof”.
“when an individual (or some other decision-making unit) forms a favorable or unfavorable attitude towards the innovation” (Y. Li & Lindner, 2007, p. 85)				+			Implies persuasion must be effective and appears to limit persuasion to attitudes toward an innovation.
“non-coercively changing an individual’s attitudes or behaviour” (Steiny, 2009, p. 474)				+		+	Implies persuasion is effective and non-coercive.
“persuasion is defined as the modification of a private attitude or belief resulting from the receipt of a message” (Angst & Agarwal, 2009, p. 346)				+	+		Implies persuasion is effective and limited to symbolic communication.
“human communication designed to influence the autonomous judgments and actions of others” (Oinas-Kukkonen & Harjumaa, 2009, p. 486)	+	+	-			+	Implies persuasion is interpersonal, intentional, and non-coercive.
“a deliberate attempt to change attitudes and/or behaviors” (Chatterjee & Price, 2009, p. 172)				+	-		Implies persuasion is intentional.
“a form of attempted influence in the sense that it seeks to alter the way others think, feel, or act” (Yu et al., 2011, p. 2)	+	+	-				Implies persuasion is interpersonal and intentional.
“an active attempt to influence people’s action or belief by an overt appeal to reason or emotion” (G. Lee & Xia, 2011, p. 289)	+	+	-			+	Implies persuasion is interpersonal, intentional, and involves awareness.
“[An] argument that attempts to explain reasons, or presents information in support of a position. Includes (but not limited to) the use of logical arguments, factual evidence, and statements of ‘expertise’ (i.e., Because that’s the nature of things)” (Prentice et al., 2011, p.65)				+	-		Implies persuasion is intentional and limited to providing reasons and information for positions.
“the attempt to guide people toward the adoption of some behavior, belief, or attitude preferred by the persuader through reasoning” (Xu, 2012, p. 5)	+	+	-				Implies persuasion is interpersonal and limited to “reasoning”.
“the presentation of an inappropriate request using the technique of appealing to emotions” (Tetri & Vuorinen, 2013, p. 1018)					-		Implies persuasion is an inappropriate request and “appeals to emotions”.

As Table 4 illustrates, the IS definitions varied in their level of agreement with the six pure persuasion criteria. Though three IS definitions agreed with three of the pure criteria, two studies agreed with only one criterion or none at all. The definitions differed greatly in the criteria that they ascribed for persuasion. Five studies argued that persuasion was limited to communication *effective* at causing attitude or behaviour change. In contrast, eight argued that persuasion was also communication that *attempted* to cause attitude or behaviour change. Some of the pure persuasion criteria, such as whether the recipient needed to be *aware* that they were being persuaded, or whether the communication needed to be *symbolic* (i.e., related to language and action rather than non-verbal cues or pictures) were rarely specified with the IS definitions we identified.

As compared to the broad definition outlined by Gass and Seiter (2011), most IS studies conceptualised persuasion more narrowly. For instance, several IS definitions conceptualised persuasion as being an outcome (e.g., “the modification of a private attitude or belief”) rather than a process. Similarly, others narrowly defined the process of persuasion as limited to “logical thoughts, appeals, credibility, and ethical proof” or “appealing to emotions” and thus excluded a wide range of phenomena that would be treated as persuasion based on Gass and Seiter (2011).

5.3 Comparing how components of persuasion are defined

We conducted an analysis to compare how the IS sample and the persuasion literature defined components of persuasion. Our literature search suggests that components of persuasion are frequently defined by referencing variables from Lasswell’s model, such as the specific source or content used (e.g., Haugtvedt & Wegener, 1994; McGuire, 1985; R. E. Petty et al., 2009). For instance, in his review of the attitude change literature, McGuire (1985) argues that persuasion is generally “analyzed as a matter of who says what, via what medium, to whom, and directed at which kind of behaviour” (p. 258). To assess the extent to which this was true of the IS sample, we used the variables from Lasswell’s model to code a subset of the definitions of components of persuasion (see Table 5). In Table 5 the symbol (+) in a variable column indicates that the definition given for that component of persuasion specifies criteria for that variable. For instance, a (+) in the source column implies that the definition of this component of persuasion specified criteria for the type of source[s] included in that component of persuasion. A blank in a column indicates that the definition does not clearly specify a value for a variable.

Table 5. Analysing definitions of components of persuasion

Definition given	Source	Content	Channel	Receiver	Effect
"Interpersonal persuasion occurs when two or a few people interact in a way that involves verbal and nonverbal behaviors, personal feedback, coherence of behaviors (relevance or fit of remarks and actions), and the purpose (on the part of at least one interactant) of changing the attitudes and/or behaviors of the other(s)" (V. Wilson, 2005, p. 162)	+	+	+	+	
"Interpersonal persuasion is the traditional persuasion which happens when two or more people interact with each other" (Yu et al., 2011, p. 2)	+		+	+	+
Persuasive systems are "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception (Yetim, 2011, p. 1)	+	+	+		
Rational persuasion "involves the use of explanations and logical arguments to show why a proposed change is important and presents factual evidence that the proposal is feasible" (Enns, Huff, & Higgins, 2003, p. 2)		+			
Rational persuasion involves "using data and information to make a logical argument supporting one's request" (S. W. Kim & Miranda, 2011, p. 5)		+			
"Persuasive technologies are designed to influence people and induce them to change their attitudes and behaviours" (Lehto & Oinas-Kukkonen, 2014, p. 1)	+			+	
Verbal persuasion is "feedback or instructions which are intended to support an individual's ability to perform a given task" (Warkentin, Johnston, & Shropshire, 2011, p. 270)	+			+	
Message-based persuasion refers to "the process of the individual's attitude changes as a result of being influenced by the messages effort" (W. K. Lee, 2012, p. 1163)				+	+
Persuasive messages are "message behavior(s) directed toward a recipient [...] that have the deliberate intention of altering the recipient's attitudes and/or behaviors toward an issue (Prentice et al., 2011, p. 62)		+			
Persuasive messages are "a dynamic external influence process" (C. Y. Li & Ku, 2011, p. 2)					
Persuasive messages are "messages that implement persuasion principles" (Kaptein & Van Halteren, 2013, p. 1174)		+			
Persuasive negotiations are "a type of negotiation where one agent is trying to influence the behaviour of another agent using arguments supporting the proposed offers" (Bentahar & Labban, 2011, p. 412)		+			

5.4 Comparing how persuasion is differentiated from related concepts

We did not find any attempt to explore or standardise how persuasion and related concepts were differentiated in our review of the persuasion literature. As we had no approaches to contrast, we therefore did not attempt to compare how the IS sample and the persuasion literature differentiate persuasion from related concepts. In the next section we aim to address this gap.

6 Suggestions for future IS research using the concept of persuasion

Based on our examination of the persuasion literature, the typical sample of IS literature, and our comparison between them, we next provide suggestions for how future IS research could i) create models of persuasion, ii) define the concept of persuasion, iii) define the components of persuasion, and iv) differentiate persuasion from related concepts.

6.1 Models of persuasion

Our analysis of the IS literature found that IS researchers generally used the Elaboration Likelihood Model to model persuasion. We also found evidence that two other approaches are used: Lasswell's model and the Heuristic-Systematic Model. As all three of the models used within IS are well-accepted within the persuasion literature, our findings do not suggest a need for changing existing IS practices. However, given recent developments in how persuasion is modelled (e.g., Kruglanski et al., 2006; Kruglanski & Thompson, 1999), one suggestion is that future IS research could also consider using single-route models of persuasion such as the Unimodel. Additionally, IS researchers might also see value in evolving existing models to address IS-specific research needs, such as in cases where the available models are ill-suited for the research or topic of interest.

6.2 Defining persuasion

Our analysis of the typical IS sample found that many of these studies failed to define persuasion, and that those studies that defined persuasion were inconsistent with each other. Our comparative analysis found that studies in the *typical case* IS sample often defined persuasion differently from the norms outlined by Gass and Seiter (2011). These two analyses suggested that IS researchers could benefit from defining persuasion more consistently. To help enable this, IS researchers could adopt the definition provided by Gass and Seiter (2011) as a standard definition. However, due to the evolution of persuasion through technology, an area of persuasion research that IS researchers increasingly examine, Gass and Seiter's definition has two limitations that reduce its optimality as a standard definition for future IS research.

The first limitation is that Gass and Seiter (2011) state that persuasion occurs within a *communication context*. This criterion excludes forms of persuasion that occur through technology but are not communication-based. For example, increasing an actor's capability to perform a target behaviour is a core technique for persuading within persuasive technology (e.g., Fogg, 2003; Oinas-Kukkonen & Harjumaa, 2009) and one that is not always communication based. The second limitation is that Gass and Seiter's definition assumes that persuasion must involve a person attempting to self-persuade or persuade one or more other persons. Rather than limiting persuasion to communication that comes from a person, contemporary research now treats technology as a source of persuasion (e.g., Nass, Moon, Fogg, Reeves, & Dryer, 1995; Nass, Steuer, & Tauber, 1994; Reeves & Nass, 1996; Sundar & Nass, 2001).

To address these limitations, we adapt Gass and Seiter's (2011) general and inclusive definition of persuasion to accommodate both non-communication contexts for persuasion and the potential role of a technology as a source of persuasion. Table 6 shows these changes. The first row shows the original definition, italicising the sections that we have removed. The second row italicises our additions to the definition.

Table 6. Suggesting a new standard definition of persuasion

Original definition	"persuasion involves one or more <i>persons who are</i> engaged in the activity of creating, reinforcing, modifying, or extinguishing beliefs, attitudes, intentions, motivations, and/or behaviours <i>within the constraints of a given communication context</i> " (Gass and Seiter 2011, p. 33)
Proposed new definition	"Persuasion involves one or more <i>agents</i> engaged in the activity of creating, reinforcing, modifying, or extinguishing beliefs, attitudes, intentions, motivations, and/or behaviours"

6.3 Defining components of persuasion

Our analysis of the typical IS sample found several cases where two or more IS studies used the same component of persuasion (e.g., persuasive messages) but defined it in very different ways. This suggests that future IS literature examining components of persuasion might benefit from using a clearer and more consistent conceptualisation process. To enable this, IS researchers could standardise how they conceptualise components, for instance, by using Lasswell's model (Lasswell, 1948) – the typology commonly used by persuasion researchers. However, several authors have suggested that Lasswell's typology cannot capture all instance of persuasion (e.g., Ajzen, 1992; R. Petty, E. & Cacioppo, 1986; Yoo, Gretzel, & Zanker, 2013). As Ajzen (1992) points out, there are "several situational variables that do not fit easily into the traditional framework of the source, message, channel, and receiver factors" (p. 4). Based on our analysis, we see at least three limitations with Lasswell's model that reduce its utility for outlining and comparing components of persuasion.

First, Lasswell's categories of variables cannot easily accommodate relevant contextual information. One example is that a component of persuasion can involve a background variable that interacts with other variables, for example, *the time of the persuasion attempt* (e.g., Valentine's Day versus Halloween) or *the location* (e.g., in private, versus in a church, or in public) may influence the effectiveness of persuasion attempts. Another example is that a component of persuasion can be differentiated from others by multiple interacting variables. For instance, a relationship researcher might examine persuasion between people who are married and have co-dependent children and whether this differs from persuasion between couples who are unmarried and childless. In such a case, it is more parsimonious and accurate to differentiate between these different components of persuasion based on *context* (e.g., persuasion limited to *communication between married couples with co-dependent children* versus persuasion limited to *communication between unmarried childless couples*) than attempting to differentiate between them based on specifying criteria for several of Lasswell's variables.

Second, Lasswell's categories of variables cannot easily accommodate relevant information about many of the stimuli that are commonly used within persuasion attempts. This is because *methods of persuasion* - the procedure(s) and information used within a persuasion attempt, do not easily fit with the commonplace conceptualisation of *content*. Though the *method of persuasion* is generally inclusive of the *content* used, it is not limited to the content used. For instance, some methods of persuasion (e.g., the door in the face technique; Cialdini, 2009) involve the source using specific types of content in a specific procedure (e.g., making a big request, then a smaller request). Other methods involve varying the complexity of processes (Oinas-Kukkonen & Harjumaa, 2009), or adding non-verbal stimuli (Fukui & Toyoshima, 2014), or cues (Higdon, 2008).

Third, variables in Lasswell's model cannot easily accommodate data on information-processing (i.e., how receivers' process the stimuli they receive). Persuasion research initially failed to consider how receivers' cognitive processing would mediate effects on their attitude and behaviour, a gap that led to the emergence of information processing models of persuasion (Eagly, 1987). However, as Lasswell's model predates information processing models of persuasion, it does not easily accommodate data about information processing.

In response to these limitations, we adapt Lasswell's model into a broader *persuasion variable typology* that can be used to outline and compare components of persuasion. First, we add a *context* variable to capture relevant information that is extraneous to the other variables. Second, we subsume the *content* variable under a *method* variable. This broad variable can accommodate commonly examined variations in interventions that would not normally be understood as *content*. Third, we add an *information processing* variable to accommodate data on information processing properties. Our persuasion variable typology therefore contains seven types of variables: source, stimuli, channel, receiver, information processing, effect, and context (see Table 7).

Table 7. The persuasion variable typology

Variable	Definition
Source	The source[s] of the stimulus or stimuli
Method	The method[s] of creating the stimulus or stimuli
Channel	The channel[s] used to transmit the stimulus or stimuli
Receiver	The receiver[s] of the stimulus or stimuli
Information processing	The receiver's or receivers' processing of the stimulus or stimuli
Effect	The outcome[s] of the receiver's or receivers' reception of the stimulus or stimuli
Context	Contextually relevant information that is extraneous to the other variables

6.4 Conceptually differentiating persuasion from related concepts

Our analyses of the persuasion literature and the typical IS sample failed to find any guidelines for differentiating persuasion from related concepts. The analyses also found inconsistency between the studies that differentiated related concepts from persuasion. These findings suggested that persuasion researchers could benefit from having guidelines for conceptual differentiation. Accordingly, we developed preliminary suggestions for how to differentiate persuasion from the similar concepts we encountered in the IS literature (e.g., rhetoric and compliance gaining). We developed these guidelines by finding papers that differentiated the concepts from persuasion and assessing if they treat it as a sub-concept, synonym, or super concept of persuasion. In all cases, we find evidence that the related concepts can be conceptualised as a sub-concept of persuasion. We now discuss the evidence in more detail, starting with the concept of *influence*.

Influence can be defined as creating "change in one's attitudes, behavior, or beliefs due to external pressure that is real or imagined" (Guadagno & Cialdini, 2005, p. 4). Influence and persuasion are often used interchangeably (Bhattacharjee & Sanford, 2006; Gass & Seiter, 2011) and no clear consensus appears to exist as to which is the higher-level construct (McLean, 2014). Indeed, some of the most well-known persuasion techniques are based on influence research (e.g., Asch, 1951; Milgram, 1963) and are referred to as demonstrating the *science of influence* (Cialdini, 2009). Several articles that we found argue that persuasion was a type of influence (e.g., Guerini et al., 2011). However, a similar number of other articles treat influence as a type of persuasion (e.g., Parsons, 1963). As persuasion appears to be more widely used within the seminal literature on technology-driven attitude and behaviour change (e.g., Fogg, 2003; Oinas-Kukkonen & Harjumaa, 2009), we therefore suggest, in the interest of consistency and clarity, that persuasion should subsume influence in future IS research where both terms are used together.

Rhetoric can be defined as “the study of how people use language and other symbols to realize human goals and carry out human activities” (Bazerman, 1988, p. 6). In contrast to persuasion, rhetoric appears more strongly and commonly associated with i) modalities, such as symbols, oration, and text, and ii) active and intensive communication, such as powerful speeches or texts (e.g., Hogan, 2012; Lunsford et al., 2009; Scallen, 1995). From this perspective, rhetoric can be treated as a method or component of persuasion. Accordingly, we suggest that persuasion should subsume rhetoric in future IS research where both terms are used together.

Coercion can be defined as “forcing people to act as the coercer wants them to act, and presumably contrary to their preferences” (J. Feinberg, 1998, p. 387). Coercion and persuasion are hard to differentiate. The distinction relates to three criteria: (i) the threat to the target if noncompliant, (ii) the ability of the target to act otherwise, and (iii) the target’s free choice (Perloff, 2003). However, researchers consistently differ in whether they define persuasion as being inclusive or exclusive of coercion, as observed in our earlier analysis of the typical case IS sample. Gass and Seiter (2011) argue that it is hard to draw the line between coercion and persuasion and therefore see coercion as a subset of persuasion. Based on the literature, we suggest that persuasion should subsume coercion where both terms are used together.

Compliance gaining can be defined as seeking “the performance of [a] target, of the specific behaviors desired of the target by another person, the agent” (Wheeless et al., 1983, p. 110). Compliance gaining is generally treated as a subset of persuasion that involves attempting to change behaviour using a direct request (Gass & Seiter, 2011; Guadagno & Cialdini, 2005; Wheelless et al., 1983), for example to not smoke (Reardon, Sussman, & Flay, 1989). We therefore suggest that persuasion should subsume compliance gaining if both are used together in future IS research.

Propaganda can be defined as “persuasive communication with which one disagrees and to which the individual attributes hostile intent” (Perloff, 2003, p. 18). The persuasion literature appears to treat propaganda as a form of persuasion associated with mass communication to multiple receivers, hegemonic political sources, and negative methods and message content (Perloff, 2003). We therefore recommend that persuasion should be used as the super concept when used alongside propaganda.

6.5 A common frame of reference for IS research on persuasion

In Figure 5 we have amalgamated the prior analyses, discussion and suggestions to create a common frame of reference. We recommend that IS researchers should consult this figure if they are attempting to understand how to conceptualise or conceptually differentiate persuasion.

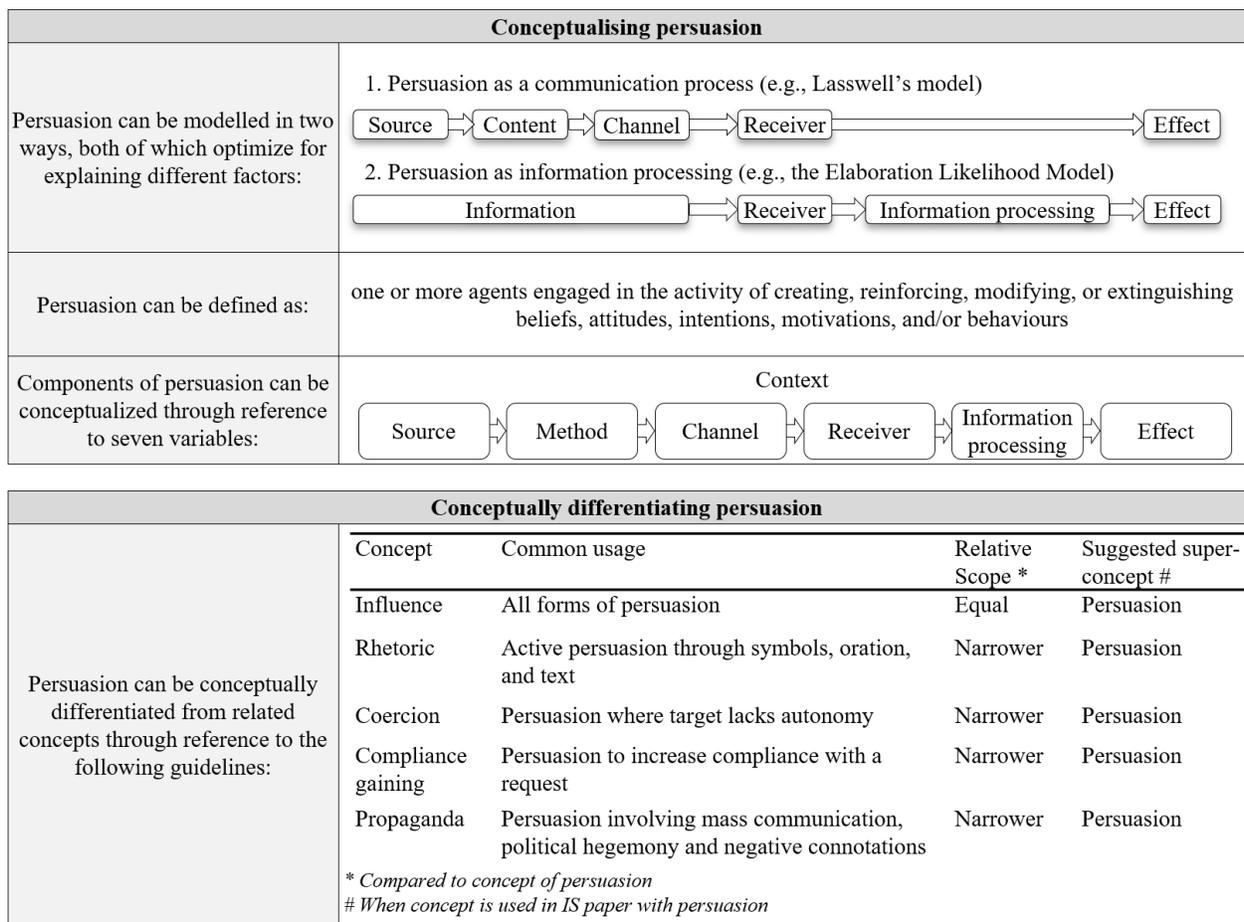


Figure 5. Persuasion within IS: A common frame of reference

7 Conclusions, limitations and opportunities for future research

The idea that behaviour change can solve social issues is becoming increasingly popular (Dolan et al., 2010). ICT is integral to many behaviour change solutions (Oinas-Kukkonen, 2013; Oinas-Kukkonen & Harjumaa, 2009), but, conversely, also integral to many behaviour change problems (Morozov, 2011a, 2011b). We therefore face a reality where ICT is deeply involved in the use of persuasion to help cure society’s ills but is also implicated in the use of persuasion that contributes to causing them.

Researchers need clear ways to categorise, discuss and evaluate attempts at ICT-driven persuasion if they are to assess the acceptability and effectiveness of these attempts. However, despite strong research streams within persuasive technology and persuasive systems design (Oinas-Kukkonen & Chatterjee, 2009; Oinas-Kukkonen & Harjumaa, 2009; Törning & Oinas-Kukkonen, 2009), IS research generally overlooks the theory and insights that exist in the persuasion literature, and lacks a conceptual reference paper for understanding persuasion. After identifying many inconsistencies across the IS literature on persuasion, this study has provided a common frame of reference as a starting point for researchers who aim to understand persuasion for the purposes of using this concept within IS research. In doing this we hope to help IS researchers understand and explore persuasion through the use of ICT. We also hope to accelerate the interchange of information between IS and other domains which are exploring how ICT can best be used to benefit society (e.g., health).

Our study provides the first synopsis of when and how IS researchers conceptualise and conceptually differentiate persuasion. This summary helps researchers to evaluate persuasion research in IS,

determine gaps and develop new approaches and contributions. The common frame of reference synthesises the extensive and discordant persuasion literature to help IS researchers conceptualise and conceptually differentiate persuasion and its components. The study also contributes to the broader examination of persuasion. Developing the analysis and common frame of reference helps to answer the call by Seiter and Gass (2004) to address disagreement in persuasion research and reconsider how persuasion should be conceptualised. When we analyse how persuasion is conceptualised we find that current definitions of persuasion fail to reflect persuasion's conceptual usage in novel areas such as persuasive technology (e.g., Fogg, 2003). In our discussion of how components of persuasion should be conceptualised we find that Lasswell's model has several limitations as a tool for conceptualising components of persuasion. Finally, our guidelines for how to differentiate persuasion are novel and potentially useful for researchers working with a range of concepts that relate to attitude and behaviour change.

We intend our guidelines and common frame of reference to be useful rather than universally accepted. Even dedicated researchers of persuasion disagree in how they conceptualise persuasion and we do not expect our study to provide a conclusive resolution to those disagreements. Instead, we hope that this summation of persuasion literature will aid and stimulate IS research into persuasion and be debated and developed over time. Given the growth in the use of ICT to change behaviour, it is expected that future IS research on persuasion will be rich and plentiful. We hope that our common frame of reference will help this research stream to be more consistent, incremental, and impactful.

As with all research, our study has several limitations that present opportunities for future research. Persuasion is a vast body of literature therefore it is possible that our study overlooks relevant theories, models, and related concepts and commentary therein. We would welcome critiques to further develop the areas that we have discussed. We would also welcome attempts to combine our common frame of reference with related material. For example, it is probable that the common frame of reference could be more useful in practical contexts if it were expanded to include a comprehensive summary of persuasive design methods (e.g., Oinas-Kukkonen & Harjumaa, 2009) or known persuasion and behaviour change taxonomies (e.g., Cialdini, 2009; Michie et al., 2013; Rhoads, 2007).

Our methodology had some significant limitations. Because of the scope of the literature examined, we text searched documents for the string "persua" to find and catalogue conceptualisations of persuasion rather than considering each document in its entirety. As a result, we only extracted and compared definitions and models that explicitly referenced some variant of the term persuasion. This may have led us to omit terms which were related to persuasion but not linked by name. Because it was not always clear when and where authors intended to conceptualise a term, we may have misattributed definitions to cases where the authors did not believe that they were providing a definition. There may also have been cases where we failed to recognise that an author had intentionally provided a definition for a relevant term. As a consequence of our methodological limitations, our study can only capture partial and incomplete representations of documents which discuss and conceptualize persuasion at great length (e.g., Oinas-Kukkonen, 2013; Oinas-Kukkonen & Harjumaa, 2009). We hope that our common frame of reference can encourage and enable future research to provide an even more detailed and thorough analysis.

From a practical perspective, we would also encourage future research to use the frameworks developed to catalogue and compare studies on persuasion. For example, as part of a scoping review, researchers could use the persuasion variable typology to categorise the combinations of variables (e.g., sources, methods, channels, and receivers) that have been used in a given research domain. From a philosophical perspective, we recommend that future research should consider if non-human agents can not only persuade but can also be persuaded. Research already explores how emerging technologies, such as artificial intelligences, may be human-like to varying extents (see Bostrom, 2014; Kurzweil, 2005; Searle, 1980). If we can believe that non-biological beings might be conscious and human-like (Calverley, 2008; Hofstadter & Dennett, 1988) then maybe we should also consider whether these beings will have beliefs, attitudes and behaviours and thus be subject to persuasion?

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Appendix A: Source lists for persuasion search

13 ACPHIS A* journals

ACM Transactions on Computer-Human Interaction
Decision Support Systems
European Journal of Information Systems
Information and Management
Information and Organization
Information Systems Journal
Information Systems Research
Journal of Information Technology
Journal of Management Information Systems
Journal of Strategic Information Systems
Journal of the American Society for Information Science and Technology
Journal of the Association for Information Systems
MIS Quarterly

40 ACPHIS A journals

Applied Ontology
Australasian Journal of Information Systems
Behaviour and Information Technology
British Journal of Educational Technology
Business & Information Systems Engineering (BISE)
Communications of the ACM
Communications of the Association for Information Systems
Computers and Security
Data and Knowledge Engineering
DATA BASE for Advances in Information Systems
Electronic Commerce Research
Electronic Markets - The International Journal on Networked Business
Enterprise Information Systems
Group Decision and Negotiation
Human-Computer Interaction
IBM Systems Journal
Information and Software Technology
Information Communication and Society
Information Systems
Information Systems Frontiers
Information Technology and People
International Journal of Cooperative Information Systems

International Journal of Electronic Commerce
International Journal of Information Management
International Journal of Medical Informatics
Internet Research: Electronic Networking, Applications and Policy
Journal of Computer Information Systems
Journal of Global Information Management
Journal of Information Systems
Journal of Information Technology Theory and Application
Journal of Knowledge Management
Journal of Organizational Computing and Electronic Commerce
Journal of the American Medical Informatics Association
Knowledge Management Research and Practice
Knowledge-Based Systems
MISQ Executive
New Technology, Work and Employment
Personal and Ubiquitous Computing
Scandinavian Journal of Information Systems
The Information Society

3 Major IS conferences

Asia Pacific Conference on Information Systems
European Conference on Information Systems
International Conference on Information Systems

Appendix B. Search terms for persuasion search

Conference papers search term

SRCTITLE("Conference on Information Systems") AND SRCTITLE(international OR hawaii OR european OR pacific) AND TITLE-ABS-KEY(persua*) AND (LIMIT-TO(DOCTYPE, "cp"))

Journal papers search term

(SRCTITLE("ACM Transactions on Computer-Human Interaction" OR "Decision Support Systems" OR "European Journal of Information Systems" OR "Information and Management" OR "Information and Organization" OR "Information Systems Journal" OR "Information Systems Research" OR "Journal of Information Technology" OR "Journal of Management Information Systems" OR "Journal of Strategic Information Systems" OR "Journal of the American Society for Information Science and Technology" OR "Journal of the Association for Information Systems" OR "MIS Quarterly" OR "Applied Ontology" OR "Australasian Journal of Information Systems" OR "Behaviour and Information Technology" OR "British Journal of Educational Technology" OR "Business & Information Systems Engineering (BISE)" OR "Communications of the ACM" OR "Communications of the Association for Information Systems" OR "Computers and Security" OR "Data and Knowledge Engineering" OR "DATA BASE for Advances in Information Systems" OR "Electronic Commerce Research" OR "Electronic Markets - The International Journal on Networked Business" OR "Enterprise Information Systems" OR "Group Decision and Negotiation" OR "Human-Computer Interaction" OR "IBM Systems Journal" OR "Information and Software Technology" OR "Information Communication and Society" OR "Information Systems" OR "Information Systems Frontiers" OR "Information Technology and People" OR "International Journal of Cooperative Information Systems" OR "International Journal of Electronic Commerce" OR "International Journal of Information Management" OR "International Journal of Medical Informatics" OR "Internet Research: Electronic Networking, Applications and Policy" OR "Journal of Computer Information Systems" OR "Journal of Global Information Management" OR "Journal of Information Systems" OR "Journal of Information Technology Theory and Application" OR "Journal of Knowledge Management" OR "Journal of Organizational Computing and Electronic Commerce" OR "Journal of the American Medical Informatics Association" OR "Knowledge Management Research and Practice" OR "Knowledge-Based Systems" OR "MISQ Executive" OR "New Technology, Work and Employment" OR "Personal and Ubiquitous Computing" OR "Scandinavian Journal of Information Systems" OR "The Information Society") AND TITLE-ABS-KEY(persua*))

Appendix C. Full list of articles, definitions and coding

Table C1. Summary of content identified

#	Authors	Lasswell	Elaboration Likelihood model	Heuristic Systematic model	Influence	Rhetoric	Compliance gaining	Propaganda	Coercion
1	(Oinas-Kukkonen, 2013)		1		1				1
2	(G. Lee & Xia, 2011)		1		1				
3	(Yetim, 2011)				1				1
4	(J. H. Kim & Bock, 2011)		1		1				
5	(Kaptein, 2011)		1		1		1		
6	(Kaptein & Van Halteren, 2013)		1		1				
7	(Angst & Agarwal, 2009)		1	1	1	1			
8	(Bentahar & Labban, 2011)				1	1			
9	(W. K. Lee, 2012)		1		1				
10	(Prentice et al., 2011)				1	1	1	1	
11	(Martin & Quan-Haase, 2013)				1				
12	(H. C. Wang & Doong, 2010)		1		1				
13	(Monteserin & Amandi, 2011)				1	1			
14	(Wathen & Burkell, 2002)		1		1				
15	(Rodríguez, Roa, Morán, & Nava-Muñoz, 2013)				1				
16	(Lustria, 2007)		1		1				
17	(Cortese & Lustria, 2012)		1		1				
18	(Enns et al., 2003)				1				
19	(M. Feinberg, 2011)					1			
20	(Wiafe, Nakata, Moran, & Gulliver, 2011)				1				
21	(Verhellen & De Pelsmacker, 2013)				1				
22	(X. Wang & Wei, 2006)		1		1				
23	(Aral, Ipeiros, & Taylor, 2011)				1				
24	(Burgoon, Chen, & Twitchell, 2010)				1				
25	(X. Wang & Teo, 2013)				1				
26	(Edwards, McDonald, Zhao, & Humphries, 2013)				1				
27	(Corbett, 2013)				1				1
28	(Comber & Thieme, 2013)				1				1
29	(Nakajima & Lehdonvirta, 2013)		1		1				
30	(Lukyanenko & Komiak, 2011)		1		1				
31	(Vance & Djasasbi, 2013)		1		1				
32	(Angst & Agarwal, 2006)		1	1	1	1		1	
33	(Tetri & Vuorinen, 2013)				1				
34	(Duan, Gu, & Whinston, 2008)				1				
35	(Massingham & Massingham, 2014)				1				
36	(Barlow, Warkentin, Ormond, & Dennis, 2013)		1		1				
37	(Cranefield, Yoong, & Huff, 2011)				1	1			
38	(Delgado-Ballester & Hernández-Espallardo, 2008)				1				
39	(Nordheim & Nielsen, 2008)				1				
40	(Kraft, Drozd, & Olsen, 2009)				1				
41	(Lehto & Oinas-Kukkonen, 2014)				1				1

Table C1. Summary of content identified

#	Authors	Lasswell	Elaboration Likelihood model	Heuristic Systematic model	Influence	Rhetoric	Compliance gaining	Propaganda	Coercion
42	(Hsieh, Hsieh, & Tang, 2012)	1			1				
43	(Lehto, Oinas-Kukkonen, & Drozd, 2012)		1		1			1	
44	(Y. Li & Lindner, 2007)				1				
45	(Johnston & Warkentin, 2010)				1				
46	(Sia, Tan, & Wei, 2002)				1				
47	(Chatterjee & Price, 2009)				1				1
48	(Ilie, 2009)				1				
49	(Luo, Luo, Schatzberg, & Sia, 2013)		1		1				
50	(Shropshire, Warkentin, & Johnston, 2010)		1		1				
51	(Graml, Looock, Baeriswyl, & Staake, 2011)				1				1
52	(Bhattacharjee & Sanford, 2006)		1		1				
53	(Peng & Slaughter, 2011)		1		1				
54	(Papazafeiropoulou et al., 2005)				1				
55	(Xu, 2012)				1				
56	(F. Li & Du, 2014)				1				
57	(Orji, Vassileva, & Mandryk, 2013)				1				1
58	(Sycara, 1993)				1				
59	(Bennett, Durand, & Betty, 1990)								
60	(Goh, Chu, & Soh, 2009)				1				
61	(Steiny, 2009)				1				
62	(Rouvette, Vennix, & Felling, 2009)		1	1	1				
63	(Haines, Cao, & Haines, 2006)				1				
64	(Bragge, Kallio, & Sunikka, 2008)		1		1				
65	(Gretzel & Fesenmaier, 2006)		1		1				
66	(Parkes, 2009)				1				
67	(V. Wilson, 2005)				1				
68	(Beun, 2013)				1				
69	(Oinas-Kukkonen & Harjuma, 2009)				1				1
70	(Parmar, Keyson, & De Bont, 2009)				1				
71	(Dijkstra, Liebrand, & Timminga, 1998)		1		1				
72	(Berkovsky, Freyne, & Coombe, 2012)				1				
73	(Ei-Shinnawy & Vinze, 1998)				1	1			
74	(M. Wilson & Howcroft, 2005)				1	1			
75	(Changchit, Joshi, & Lederer, 1998)				1				
76	(G. Lee & Lee, 2009)		1		1				
77	(S. W. Kim & Miranda, 2011)		1		1				
78	(Kwon & Sung, 2012)				1				
79	(Goh, Heng, & Lin, 2013)		1		1				
80	(Sokolova & Szpakowicz, 2007)				1				
81	(Alvarez & Urla, 2002)					1			
82	(Cugelman, Thelwall, & Dawes, 2009)		1		1	1			
83	(Chen, Gustafson, & Lee, 2002)				1				
84	(Park, Lee, & Han, 2007)		1		1				
85	(Qiu & Wang, 2011)				1				
86	(C. Y. Li & Ku, 2011)		1		1				
87	(Gönül, Önköl, & Lawrence, 2006)				1				

Table C1. Summary of content identified

		Lasswell	Elaboration Likelihood model	Heuristic Systematic model	Influence	Rhetoric	Compliance gaining	Propaganda	Coercion
#	Authors								
88	(Morrison & Vogel, 1998)				1				
89	(Warkentin et al., 2011)				1				
90	(Robles, Nass, & Kahn, 2009)				1	1			
91	(Van Dantzig, Geleijnse, & Van Halteren, 2013)				1				1
92	(Yu et al., 2011)		1		1				1
93	(Huang et al., 2006)		1		1				
94	(Dijkstra, 1999)								
95	(Mak, Schmitt, & Lyytinen, 1997)		1		1				
96	(Santhanam, Sasidharan, & Webster, 2008)				1				
97	(Huang & Lin, 2007)								
98	(Wattal, Schuff, Mandviwalla, & Williams, 2010)				1				
99	(Tam & Ho, 2005)		1		1				
100	(Rui, Liu, & Whinston, 2013)				1				
	Total mentions	1	36	3	95	12	2	2	12

Table C2. Summary of definitions found

#	Definition(s) given for persuasion	Definition(s) given for components
1		<i>Computer-mediated persuasion</i> means that people are persuading others through computers, for example, e-mail, instant messages, or social network systems (p. 1227)
2	<i>Persuasion</i> : is an active attempt to influence people's action or belief by an overt appeal to reason or emotion (p. 289)	
3		<i>Persuasive Systems</i> are designed to change a person's attitude or behaviour or both, without using coercion or deception (p. 2)
5		<i>Persuasive technologies</i> : technologies that are intentionally designed to change a person's attitude or behaviour (p. 2); a <i>persuasion profile</i> — a collection of expected effects of different influence strategies for a specific individual (p. 3)
6		<i>Persuasion principles</i> : different psychological means by which to influence users (p. 1173); <i>Persuasive Messaging System</i> : a persuasive system that is designed to increase the effectiveness of reminder emails that are sent out in a commercial activity promotion service (p. 1173); <i>persuasive messages</i> : messages that implement persuasion principles (p. 1174)
8		<i>Persuasive negotiation</i> : is a type of negotiation where one agent is trying to influence the behaviour of another agent using arguments supporting the proposed offers (p. 412)
9		<i>Message-based persuasion</i> : the process of the individual's attitude changes as a result of being influenced by the messages effort (p. 1163)
10	<i>Persuasion</i> : Argument that attempts to explain reasons, or presents information in support of a position. Includes (but not limited to) the use of logical arguments, factual evidence, and statements of 'expertise' (i.e., because that's the nature of things) (p. 65)	<i>Persuasive messages</i> : "message behavior(s) directed toward a recipient (e.g., a vulnerable young Muslim) that have the deliberate intention of altering the recipient's attitudes and/or behaviors toward an issue" (p. 62)
18		<i>Rational Persuasion</i> : The agent uses logical arguments and factual evidence to persuade the target that a proposal or request is viable and likely to result in the attainment of task objectives (p. 158)
27		<i>Persuasive systems</i> are defined as "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception (p. 340)
29		<i>Persuasive ambient mirrors</i> : systems that use visual feedback to effect changes in users' everyday living patterns (p. 1)
31		<i>Interpersonal persuasion</i> : occurs when two or a few people interact in a way that involves verbal and nonverbal behaviors, personal feedback, coherence of behaviors (relevance or fit of remarks and actions), and the purpose (on the part of at least one interactant) of changing the attitudes and/or behaviors of the other(s). This definition separates interpersonal persuasion from mass media persuasion, in which personal feedback and coherence are not present; (p. 3)
33	<i>Persuasion</i> : the presentation of an inappropriate request using the technique of appealing to emotions (p. 1018)	
34		<i>Persuasive effects</i> : to shape consumers' attitudes and evaluation towards the product and ultimately influence their purchase decision (p. 1009)
43		<i>Persuasive technologies</i> influence users' behavior and perceptions, and various tactics may be applied by these technologies to support different outcomes and behavior change strategies (p. 2)
44	<i>Persuasion</i> : occurs when an individual (or some other decision-making unit) forms a favorable or	

Table C2. Summary of definitions found

#	Definition(s) given for persuasion	Definition(s) given for components
	unfavorable attitude towards the innovation (p. 85)	
47	<i>Persuasion</i> : is a deliberate attempt to change attitudes and/or behaviors (p. 172)	<i>Persuasive computing technology</i> is a computing system, device, or application intentionally designed to change a person's attitude or behavior in a predetermined way (p. 171); <i>Persuasive technology</i> : any interactive computing system designed to change people's attitudes and/or behaviors (p. 171)
48		<i>Rational persuasion</i> : involves the use of explanations and logical arguments to show why a proposed change is important and presents factual evidence that the proposal is feasible (p. 3).
49		<i>Recommendation persuasiveness</i> is defined as the extent to which the reader views the argument of the recommendation as convincing or valid in supporting its position (p. 94)
51		<i>Persuasive systems</i> : computerized software or information systems to reinforce, change or shape attitudes or behaviours or both without using coercion or deception (p. 2)
53		<i>Persuasive technologies</i> ; tools which are used to change one's attitude and behavior (p. 5)
54	<i>Persuasion</i> : occurs when a potential adopter forms a favourable or unfavourable attitude towards and innovation (p. 5)	
55	<i>Persuasion</i> : the attempt to guide people toward the adoption of some behavior, belief, or attitude preferred by the persuader through reasoning (p. 5)	
57		<i>Persuasive technology</i> is a term used to describe technologies that change human behavior and/or attitude in an intended way without using deception or coercion (p. 1211)
61	<i>Persuasion</i> : non-coercively changing an individual's attitudes or behavior (p. 474)	<i>Persuasive technology</i> is technology that is specifically designed to persuade people (p. 474)
66		A <i>persuasive decision support system</i> will convince a decision maker to rely on the decision support provided (p. 2)
69	<i>Persuasion</i> : human communication designed to influence the autonomous judgments and actions of others (p. 486)	<i>Persuasive systems</i> may be defined as "computerized software or information systems designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception (p. 486)
70		<i>Persuasive health information systems</i> (PHIs), systems which persuades users to access information to increase their primary health knowledge, thus motivating them to improve their health practices (p. 428); <i>Persuasive computing</i> : any interactive computing system designed to change people's attitudes or behaviour (p. 429)
77		<i>Rational persuasion</i> : using data and information to make a logical argument supporting one's request (p. 5)
82		<i>Persuasive technology</i> aims to influence attitudes and behaviours through technology interactions (p. 457)
86		<i>Persuasive messages</i> : a dynamic external influence process (p. 2)
88	<i>Persuasion</i> : a communication process whereby the communicator seeks to influence behavior, change attitudes and beliefs, or otherwise cause acceptance of a new cognitive state in an area where the person being persuaded has some measure of freedom (p. 126)	
89		<i>Verbal persuasion</i> refers to feedback or instructions which are intended

Table C2. Summary of definitions found

#	Definition(s) given for persuasion	Definition(s) given for components
92	<i>Persuasion</i> : a form of attempted influence in the sense that it seeks to alter the way others think, feel, or act (p. 5)	to support an individual's ability to perform a given task (p. 270) <i>Persuasive Technology</i> : "interactive information technology designed for changing users' attitudes or behavior (p. 2); <i>Interpersonal persuasion</i> is the traditional persuasion which happens when two or more people interact with each other (p. 2); <i>Computer-mediated persuasion</i> takes place when people are persuading others through technology, for example discussion forums, e-mail, instant messages, blogs, or social network systems (p. 2). <i>Human-computer persuasion</i> differs from other two types of persuasion in that it is the computer (system, technology, etc...) that makes the persuasion directly (p. 2); <i>Persuasive systems</i> are defined as "computerized software or information designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception" (p. 3)
93	<i>Persuasion</i> : a process through which one skillfully and ethically uses logical thoughts, appeals, credibility, and ethical proof to influence and motivate others to respond as one wishes (p. 85)	<i>Computerized persuasion technologies</i> is a new area of inquiry concerned with how one applies information technology to change a counterpart's attitude or behavior toward accepting one's proposal (p. 85)

About the Authors

Peter Slattery is a Research Fellow at BehaviourWorks Australia in Monash University, with a PhD from the University of New South Wales (UNSW) Business School. His research focuses on understanding how to use technology to encourage socially beneficial behaviour. He has published in *Information Systems & Organization* and the proceedings of several leading IS conferences.

Richard Vidgen is Professor of Business Analytics at the University of New South Wales (UNSW) Business School, Australia, Professor of Business Analytics at Birkbeck University, London, and Emeritus Professor of Systems Thinking at the University of Hull, UK. Following fifteen years working in the IT industry he held academic positions at the University of Bath, UNSW, and the University of Hull. His research focuses on the management and organizational aspects of business analytics and data science. He has published in the proceedings of leading IS conferences and in a variety of journals, including *Management Information Systems Quarterly*, *Information Systems Research*, *Journal of the Association for Information Systems*, and *European Journal of Operational Research*.

Patrick Finnegan is Professor of Information Systems at the School of Information Systems, Technology and Management at UNSW Australia. His research, which adopts a multi-method perspective, is in the area of IS strategy, e-business, and IS innovation. He has published in the proceedings of leading IS conferences and in a variety of journals, including *Information Systems Research*, *European Journal of Information Systems*, and *Information Systems Journal*. He is currently a Senior Editor of the *Information Systems Journal* and *Foundations and Trends in Information Systems*.

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