

## INTRODUCTION TO THE SPECIAL ISSUE ON NOVEL PERSPECTIVES ON TRUST IN INFORMATION SYSTEMS

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Research on trust has taken center stage in the MIS field in the past few decades, covering a wide range of trust-related topics based on a multitude of theories from sociology and psychology to economics. To extend this rapidly emerging trend and identify some ground-breaking perspectives on the study of trust, this special issue of the *MIS Quarterly* on “Novel Perspectives on Trust in Information Systems” aims to explore novel aspects of trust in new and under-researched IS contexts. In brief, the intent of the special issue was to publish innovative research articles about (1) novel ante-

cedents of trust, (2) the construct of distrust and its relationship to trust, (3) the boundaries of trust, and (4) the study of trust in new and unexplored MIS contexts (Benbasat et al. 2008).

The papers submitted were first screened by the editors, in some cases aided by an associate editor, to verify their appropriateness to the topic of the special issue and their novelty. The remaining manuscripts went through the *MIS Quarterly*'s standard, rigorous review process, including the usual “arms-length” and “conflict of interest” guidelines for the senior editors, associate editors, and reviewers in the handling of the papers. Interestingly, neither of the papers eventually accepted utilized traditional research methods commonly used in past research on trust in MIS. Indeed, the two papers that appear in this special issue dealt with what to MIS research are rather novel methodologies (namely functional brain imaging, specifically functional magnetic resonance imaging, or fMRI) (see Belliveau et al. 1991; Friston et al. 1994; Logothetis et al. 2001; Ogawa et al. 1990), which enabled these two papers to offer new insights into topics that were out of reach for the more traditional research methods previously used in trust research. By no means do we imply, however, that future novel contributions to the study of trust in MIS research should be limited to any particular research methodologies.

### Papers That Appear in the Special Issue

After a very comprehensive reviewing process, two outstanding papers that truly present a breakthrough for research on trust in MIS were chosen for publication. These papers

represent novel theoretical perspectives and draw upon new methodological methods. Specifically, both papers follow an empirical methodology (neuroimaging with fMRI) that allows the direct measurement of brain activity and relies on the cognitive neuroscience literature (e.g., Camerer 2003; Glimcher et al. 2009; Lieberman 2007) that, in our opinion, may be transformative, both to the study of trust and also to the MIS discipline as a whole. In doing so, these two papers add several new theoretical and methodological perspectives to the research of trust in MIS, both in terms of introducing a new measurement approach and also in terms of developing new theory, as described in detail below.

### ***Dimoka: What Does the Brain Tell Us about Trust and Distrust?***

The paper by Dimoka titled “What Does the Brain Tell Us about Trust and Distrust: Evidence from a Functional Neuroimaging Study” tackles the still unanswered question whether trust and distrust are distinct constructs or whether they are part of the same continuum. This question has come up many times in the past (e.g., McKnight et al. 2004), but researchers always faced a major challenge, especially in survey-based research, of statistically making a compelling case for the relationship and distinction between trust and distrust. This is because survey-based measurement scales for trust are bound to have positively worded items, while distrust scales are bound to have (sometimes the same) negatively worded items, thus making it likely, and perhaps methodologically biased, to distinguish between trust and distrust. Other approaches, such as process tracing, have also been used within the context of experimental research to show the antecedents of trust and distrust (Wang and Benbasat 2008) and to assert that trust and distrust may be distinct constructs (Komiak and Benbasat 2008). Making this distinction is important because, as Pavlou and Gefen (2005) imply, trust and distrust may be associated with each other, but their effects are clearly distinct from each other, with trust dealing with giving credit to people in an attempt to understand them (Gefen et al. 2003) and distrust dealing with a mindset of suspicion and fear of others. In sum, the distinction between trust and distrust is still an unresolved issue, both in the MIS literature (e.g., Benamati et al. 2008; Komiak and Benbasat 2008; McKnight and Choudhury 2006) and also in other disciplines in the social and management sciences (e.g., Cho 2006; Gans et al. 2001; Kramer 1999; Kramer and Cook 2004; Lewicki et al. 1998).

Using fMRI to complement psychometric measurement scales of trust and distrust, Dimoka captured the location, timing, and level of brain activity that are associated with trust and

distrust when subjects interacted with four experimentally manipulated seller profiles that differed on their level of trust and distrust in a neuroeconomics experiment in the context of online auctions. The fMRI results showed that trust and distrust are associated with the activation of different brain areas, thus offering evidence that trust and distrust are distinct constructs that are associated with different neurological processes. Specifically, the neural correlates of trust were shown in this fMRI study to be the *caudate nucleus* (confident expectations about anticipated positive rewards) (King-Casas et al. 2005), the *anterior paracingulate cortex* (predicting how the trustee will act in the future) (McCabe et al. 2001), and the *orbitofrontal cortex* (uncertainty from the trustor's willingness to be vulnerable) (e.g., Krain et al. 2006). Distrust was shown to be linked to brain areas linked to intense negative emotions (amygdala) and fear of loss (insular cortex). Moreover, Dimoka showed a clear distinction in the brain areas associated with the dimensions of trust and distrust with credibility and non-credibility being mostly associated with the brain's more cognitive areas, while benevolence and malevolence are mostly associated with the brain's more emotional areas, that were more exacerbated in women than in men.

The Dimoka paper contributes by offering strong neurological evidence that the two focal constructs (trust and distrust) are associated with different brain areas, thereby showing their functional distinction at the brain level. Second, it contributes by showing that trust, at least in the context of online auctions, is probably more cognitive and calculative in nature, while distrust is more emotional in nature. Third, it contributes to our better understanding of the dimensionality of trust and distrust by identifying distinct neural correlates for their dimensions. Finally, it shows that brain activity associated with trust and distrust is a better predictor of economic outcomes (price premiums) than the corresponding self-reported psychometric scales of trust and distrust, thereby extending Pavlou and Dimoka's (2006) work on the role of trust on price premiums in the context of online auctions and also the functional neuroimaging literature on comparing the predictive power of neurological versus behavior data.

Besides these contributions, the ramifications of this paper, important as Dimoka proposes them to be, are, in our opinion, even greater. If the distinction between positive beliefs and negative beliefs, shown here in the context of trust and distrust, can be extended to other domains, it has implications for other IS constructs with similar properties. It may be necessary now to reexamine many other constructs in the literature where studies utilized positive and negative beliefs as opposite sides of the same continuum. Such studies can inquire, now that we can “look” into the underlying brain processes of other MIS constructs with functional neuroimaging tools,

such as fMRI, as to whether other IS constructs that are associated with positive and negative beliefs span two extremes of the same continuum, or whether they are actually two distinct constructs that have been erroneously treated as a unitary construct. Such research could look into whether satisfaction and dissatisfaction are on the same continuum as implied in SERVQUAL (Zeithaml et al. 1996) or maybe, as in the case of trust and distrust, are two distinct constructs. The same applies to differentiating the nature of the many types of risks in outsourcing contracts (Bahli and Rivard 2003; Gefen et al. 2008; Gewald and Dibbern 2009; Kliem 2004; Osei-Bryson and Ngwenyama 2006). This opens avenues for future research that calls for reexamining the nature, dimensionality, distinction and relative effects of multiple IS constructs that are associated with positive and negative beliefs.

### **Riedl, Hubert, and Kenning: Are There Neural Gender Differences in Online Trust?**

The paper by Riedl, Hubert, and Kenning titled “Are there Neural Gender Differences in Online Trust: An fMRI Study on the Perceived Trustworthiness of eBay Offers” deals with another hard to tackle issue, the relationship between trust and gender. There have been a small number of published studies in the MIS literature that have compared men and women (e.g., Awad and Ragowsky 2008; Gefen and Straub 1997; Venkatesh and Morris 2000), but, as a sensitive topic, most MIS research has generally tended not to study gender differences.

Using a laboratory experiment with 10 female and 10 male subjects in the context of eBay’s online auctions, Riedl, Hubert, and Kenning showed neurological differences across men and women when they simultaneously viewed different offers from manipulated eBay sellers who differed on their levels of trustworthiness. Specifically, they found that trustworthiness is encoded partly in different brain areas in women and men, thus identifying important neurological differences across genders. Moreover, more brain areas were shown by the authors to be activated in women than in men. These findings may support the popular notion that women act upon their emotions more readily than do men, largely because emotion-laden brain areas, such as the amygdala and the insular cortex, which are triggered by intense and sudden emotional states (Kenning et al. 2007), particularly negative ones (LeDoux 2003), are more salient in women than in men. These findings also have important ramifications for understanding the differences between men and women by offering a neurological explanation for such behavioral differences.

With the convincing neurological evidence presented by Riedl, Hubert, and Kenning, we expect the topic of gender to

reemerge as a major topic in MIS research, both in the study of trust and elsewhere. If indeed the results showing that men and women process trust-related information in different areas in the brain can be interpreted as men and women processing trust-related information and deciding whether to trust based on different processes, the ramifications of this study could also be path-breaking. Similarly, Dimoka found that emotional responses in the brain are more salient in women than in men. Much research in MIS and other disciplines in the social and management sciences has overlooked gender differences. But, if trust is processed differently across genders, and because trust is known to be central to most human engagement, then probably there is reason to suspect the same may apply to other beliefs and constructs as well. Hence, this special issue may be a call for future research in MIS and other disciplines in exploring potential neurological and behavioral differences across genders, not only in terms of trust but also across a broader variety of constructs.

## **Integrating the Special Issue Papers ■**

What is common across the two papers in this special issue is the use of a novel method (functional neuroimaging, specifically fMRI) and their reliance on the cognitive neuroscience literature with emphasis on social neuroscience (neuroeconomics, neuropsychology, and neuromarketing). By measuring brain activity directly and objectively, functional neuroimaging is a promising tool in the social sciences, and it has helped shed light on many unanswered questions in economics, psychology, and marketing (for a review of the cognitive neuroscience literature in the social sciences, see Dimoka et al. 2010b). This trend has been recently extended to MIS research (e.g., Dimoka et al. 2010a; Riedl et al. 2010), and these two papers in this special issue help provide some strong initial empirical evidence for the potential of functional neuroimaging tools and the cognitive neuroscience literature for MIS research.

Besides better understanding the relationship and distinction between trust and distrust across genders, the two papers in this special issue hold great promise for expanding theory on trust, distrust, and gender differences in MIS research. First, the direct and objective measurement of trust and distrust with objective brain data can guide the identification and testing of novel IT-enabled antecedents of trust and distrust, and how they may differ across genders. Second, extending the examination by Riedl, Hubert, and Kenning of gender differences in terms of trust, future research could examine potential gender differences in terms of distrust, thus understanding how distrust may neurologically differ between men and women. Dimoka offered some initial evidence to suggest that

the brain areas associated with distrust are more salient in women than in men. Third, the boundaries of trust and distrust across genders could be examined with fMRI data by testing how the neural correlates of trust and distrust are influential on various behavioral and economic outcomes, such as prices and transactions. Fourth, the neural correlates of trust and distrust could vary across various MIS contexts, thus potentially contributing some new perspectives on trust theory rendered by each novel context.

Taken together, we believe that these two papers may help spawn some interesting future research on further exploring the constructs of trust and distrust and also potential differences across genders. The introduction and use of fMRI technology and the reliance on the emerging cognitive neuroscience literature may have important implications for both the trust and distrust literature and also for the MIS literature in general. Specifically, they may have profound implications for other MIS theories, as explicated in more detail by Dimoka et al. (2010a). Drawing upon this special issue, which has introduced two outstanding empirical fMRI studies on trust, distrust, and gender differences, we are possibly looking into an interesting upcoming decade of MIS research where many of the previously accepted MIS theories may need to be revisited and hopefully refined using functional neuroimaging tools as a complementary method.

## Special Thanks

We wish to thank all of the associate editors for their tremendous help and support in making this special issue possible: Sulin Ba, Vivek Choudhury, Robert Davison, Chrysanthos Dellarocas, Jens Dibbern, Tamara Dinev, Dennis Galletta, Mike Gallivan, Anindya Ghose, Rajiv Kohli, Harrison McKnight, Gabriele Piccoli, Michael O'Leary, Venkatesh Shankar, Katherine Stewart, Choon-Ling Sia, and Mariam Zahedi. We give special thanks to all of the anonymous reviewers for their significant contributions to this special issue.

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