

Information Security Compliance: A Complete Values View

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Abstract

Cybersecurity threats and Information Security Policy Compliance is an important IS research stream. This paper extends the Unified Model of Information Security Policy Compliance – UMISPC - by drawing on Schwartz’s universal theory of personal value types. In particular, we consider the values construct as a more precise representation of the person’s motivations to information security policy compliance than the factor 1 “role values” posited in the model. We also hypothesize the values – intention to comply relation being moderated by social factors as per recent theoretical developments.

Keywords

UMISPC, Theory of Value Types, Information Security Compliance, Values Construct

Introduction

Cybersecurity threats are increasing worldwide. McAfee and the Center for System Information Security (CSIS) estimate cybercrime’s worldwide costs grew in 2017 to be more than 600 billion USD (0.8% of global GDP), from 400 billion estimated in 2014 (CSIS 2018). In addition to that, many multinational organizations identify lack of knowledge or careless behavior of employees in regards to security policies as primary global security concerns(PWC 2018).

IS scholars have theorized about the potential reasons why employees behave in a manner contrary to security policies, in an attempt to explain and prevent this type of risky behavior i.e. (Bulgurcu et al. 2010; Crossler et al. 2014). Recently, Moody et al. (2018) evaluated the 11 leading theories in policy compliance to integrate a unique theory that extracts elements from different theories proposing a new Unified Model for Information Security Policy Compliance (UMISPC). In their unified model, the main predictor of policy compliance intentions was a value construct (Moody et al. 2018, p. 306).

The purpose of this research project is to enhance UMISPC (Moody et al. 2018) by expanding upon the “role values” construct as the main predictor of security behavior. In this research, we contend that the values construct has a richer meaning and interpretation than the mere values associated with the person’s role in the organization. By using Schwartz’ universal theory of personal value types (Schwartz 1992), we theorize that values play a critical role in compliance intention and security behavior. In doing so, we address the following research question: Which values explain the different protective behavioral intentions in information security policy compliance?

Background Literature (UMISPC)

Moody et al. (2018) reviewed and compared the 11 leading theories used to explain security policy compliance in IS research, similarly to Venkatesh et al. (2003). They were able to combine several constructs into more general constructs in order to reduce the complexity of the model. They retained 11 factors that were the base for UMISPC. They found support for the majority of all the proposed relationships in the 11 theories as well as relevance in explaining Information Security (InfoSec) policy violations.

Expanding on their findings and in order to formulate their own unified model, they used Triandis’ (1977) Theory of Interpersonal Behavior (TIB) as their underlying framework for the UMISPC. Even though TIB

was chosen as the underlying theory, other constructs were included in order to have a new and unified model. They included the fear appeal portion from Protection Motivation Theory (PMT). This replaced affect as a predictor of intention, as TIB posited. Further, based on data-driven results self-efficacy was deemed not a relevant factor, so response-efficacy was instead used as a predictor of threat. They also included reactance as a route for denying the possible security problem as an alternative way to cope with fear. Neutralization was a factor that served as an antecedent to reactance.

Moody et al. (2018) found support for the proposed dual pathway (intention and reactance) as well as for the habit, fear and role values being predictors of intention to comply, while neutralization and fear would predict reactance. As per the result of their studies, they formulated a final refined version of their UMISPC model that will be the base for our theoretical contributions.

Factor 1 called “role values” had the largest impact on intentions to comply; interestingly the “role values” construct is not originally in the TIB model or any of the 11 tested models. They explain the inclusion of this construct’s definition as the result of the lack of social elements in their factor 1 which was intended to represent social factors (Moody et al. 2018, p. 301), providing no further conceptual explanation makes the theoretical support for this interpretation weak, generating an opportunity for our research in which we can determine to what extent role values may be the generic reason behind InfoSec policy compliance intentions. Another point to evaluate is why social factors are not significant in the model; Moody et al. believe social factors should be a part of the model and explain the reason why it was not significant on the scenarios they had chosen for their study since none of them were socially visible or induced (Moody et al. 2018).

The Values Construct

Searching how role values had been used as a predictor of intention to comply, we looked at the different concepts used in the IS literature without finding the use of a role values concept in similar contexts. Leidner and Kayworth (2006) define culture as a critical variable that is conceptualized in terms of values as a predominant approach to study culture in organizational and national contexts. They present an extensive list of values used in IS for national, organizational and sub-units analysis, some of them are usually referred to as work values (Dose 1997). Other studies used cultural values (Hofstede 1983) as a key conceptual construct to identify the impact of national cultures in IS studies (Zhang and Lowry 2008). In the literature, we find examples of human values of ethical import (Friedman and Kahn Jr 2007) used in IS design science research (Joshi et al. 2016). Also, often mixed with or replacing values, researchers use personality trends as a reference and predictor in defining security behavior (Shropshire et al. 2015).

Among those many values constructs, which one fits factor 1, called “role values”? We were not able to find a straight forward answer, considering the importance of factor 1 in the UMISPC theory. We aim for a more comprehensive explanation for factor 1 by analyzing in detail the different values’ concepts looking for solid theoretical support to the proposed value in UMISPC thus proposing Schwartz’s (1992) theory of value types as the best alternative to explain InfoSec compliance behavior.

Work values are values as preference while personal values are values as principles, values as preferences are related to attitudes but not to behavior (Parks and Guay 2009). When it comes to personality and values, both relate to behavior and it is valid to include both as behavior predictors, being both different but slightly correlated constructs (Parks and Guay 2009). However, values are evaluative and relate to what we believe we should do, while personality is what without thinking we would do (Parks and Guay 2009, p. 677). Another important differential factor is that personality traits are innate and not changeable while values are learned and can be adapted as each person desires (Olver and Mooradian 2003).

We consider that the most useful theory to explain behavior-values relationship is by using Schwartz’s (1992) personal values conceptualization. Schwartz conceives values as a universal system of cognitive representations of the individual motivations. Schwartz places importance in the concept that people differ only in the relative weight each individual has on each of the value types and since each of them is a representation of one motivation it is possible to give high priority to different values simultaneously. Schwartz originally defines 10 types of values; later extended his theory dividing some of those 10 value types to account for 19 types of values which form the circular motivational continuum (Schwartz et al. 2012)

Rohan (2000) also brought light in general confusion and misuse of the values construct and the differences between value priorities, types, and systems. In support of Schwartz’s theory, she clarifies that all humans have a value system, and this value system is comprised of a specific number of value types, but each person places a different relative priority on each of the types (Rohan 2000, p. 262). According to Rohan, the value types defined by Schwartz are unique and apply to all humanity regardless of whether they are studied in the context of personal or social value systems; however, at the personal level, there will be only one personal value system, while people tend to have more than one social value system. She also points out that the personal and social value systems are comprised of exactly the same value types (Rohan 2000, p. 267).

UMISPC Extension and Hypothesis Formulation

Taking Schwartz’s (1992) theory of value types, as the values reference theory for our project we propose modifications to Moody et al. (2018) UMISPC and explain our research model and hypothesis.

Other than the relationship between role values and intentions to comply, the six remaining relationships in the model will constitute the baseline hypothesis for our model. The relationships were the result of the comparative analysis made by Moody et al. (2018) in developing UMISPC. Those relations were not theoretically hypothesized in their article since they had already been discussed and tested in previous literature for all the different selected models; by using an innovative strategy they tested the relationships again and results-compared to define the UMISPC.

Schwartz (1992) diagrammed the value types making emphasis on that priorities on adjacent value types will be similar; in opposite values, conflicting and large difference in priorities will be present. Further literature identifies the values construct as a multidimensional, and also summarizable in terms of a two-dimensional structure (Bardi and Schwartz 2003; Rohan 2000; Schwartz et al. 2012). Even with many values being part of any of the value types (56 values tested by Schwartz) the value construct can be parsimoniously defined as comprised of “four higher order value types that form two basic, bipolar, conceptual dimensions”(Schwartz 1992, p. 43). These 2 bipolar dimensions are openness to change versus conservation and self-enhancement versus self-transcendence. The two basic dimensions and the types of values included in each dimension are represented in figure 1.

Considering that “role values” was not initially part of the analyzed and defined constructs in UMISPC, and according to the theory of value types there is no type of value such as role value, we speculate that factor 1 construct is a partial representation of the values construct. Figure 1 summarizes our theoretical model, including the values construct, as defined by Schwartz, thus proposing an alternate modified UMISPC version. This representation takes into account all the original UMISPC, integrating the values construct theory by considering the complete second-dimensional order and its bipolar definition.

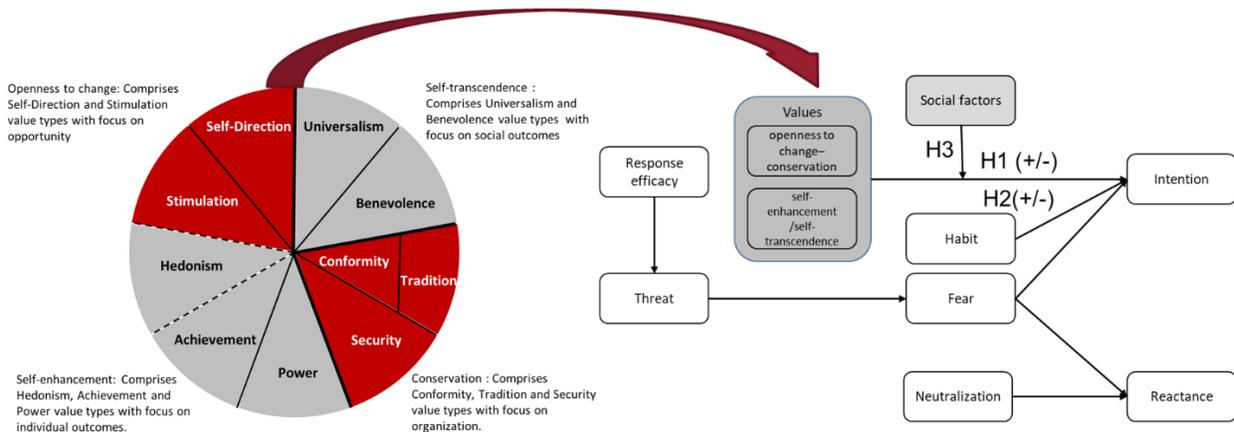


Figure 1: The Values Construct Proposed Inclusion and UMISPC modification.

Openness to change orders the values in a way that motivates the person to follow their own interest (no matter if it is economic, intellectual or emotional interest) sometimes in directions riskier than other people would do. Conservation considers the values that look to maintain the status quo and are averse to change

and prompt to keep traditions and maintain long time relationships (Schwartz 1992). In that sense, we propose openness to change will negatively impact the intentions to comply with the policy, while conservation will be more positively related with intentions to comply with InfoSec policies.

H1: Conservation/Openness to change is related with intention to comply with InfoSec policy, such that individuals who prioritize this value are more likely to comply with InfoSec policies, while those who prioritize openness to change are less likely to comply with InfoSec policies.

Self-enhancement orders values that motivate people to highlight their own personal interests (even at the expense of others). Self-transcendence promotes values that motivate people to be unselfish and look to benefits to be generally distributed between relatives, others and society in general (Schwartz 1992). As with openness to change we postulate a negative impact from self-enhancement on intentions to comply with security policy, thus we propose self-transcendence to be positively related with intention to comply with information security policies.

H2: Self-transcendence/self-enhancement is related with intention to comply with InfoSec policy, such that individuals who prioritize self-transcendence are more likely to comply with InfoSec policies, while those who prioritize self-enhancement are less likely to comply with InfoSec policies.

Bardi and Schwartz (2003) in their study regarding the strength of the relationship between values and behavior, found that social or peer pressure weakens the relationship between values and behavior. “Norms for behavior in relevant groups pose an important situational pressure. People may conform to norms even when the normative behavior opposes their own values. Consequently, the more behavior in a domain is subject to normative pressure, the weaker the expected relation between values and behavior in that domain.”(Bardi and Schwartz 2003, p. 1217).

Also Schwartz et al. (2017), by testing the values – behavior relationship, found partial support for their relation and call for further research on the conditions under which social factors (normative pressure) would moderate or not the values – intention to behave relationship. Thus, taking into consideration Schwartz et al. findings and in order to include an important construct in TIB and InfoSec policy compliance theories, we will test the moderating effect of social factors/norms in the relationship between values and InfoSec policy compliance.

H3: Social norms will moderate the relationship between values and InfoSec compliance intentions.

Research Methodology Proposal

We will conduct a three scenarios methodology with a supporting survey as the focus of this initial research. The instrument will be based on what has been already tested for UMISPC (Moody et al. 2018), by including items from previously tested measures for each of the constructs. For the values construct we will adapt the PVC-RR measure developed and amply tested by Schwartz et al. when extending the definition of the values construct from 10 to 19 value types. (Ciecuch et al. 2014). For social factors/norms, we will also adapt previous items from the extent IS use of the social factors construct.

The complete instrument will be pilot tested. The psychometric properties of the scales will be confirmed, for item loadings and reliabilities Cronbach’s α scores will be used, content and construct validity will be assessed. After the first analysis and possible modifications, the survey will be conducted again. Partial least squares (PLS) will be used to analyze the data and test our proposed enhancements to UMISPC model.

Conclusion and Future Plans

The universal theory of personal value types (Schwartz 1992) is a promising concept to analyze different alternatives in InfoSec policy compliance. By including it in the UMISPC we offer an alternative explanation to the factor 1 construct and also open a venue to include social factors as an important concept in InfoSec policy compliance not fully considered in UMISPC. Once this pilot study is completed, we plan to further extend the study to a cross-cultural research project and also continue testing specific value types in order to analyze the effects and interactions of the different values in our intention to comply with InfoSec policies dependent variable.

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