

# The Use of Uncertainty Reduction Theory in Communication

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**Abstract.** Based on references that are mainly published in recent years, this paper focuses on the application of uncertainty reduction theory (URT) in communication science in recent years. After explaining concepts that are related with URT, this paper reflects on the possible application of URT in different scenarios proposed by previous researchers, and therefore provides guidelines of reducing uncertainty--either passive, active or interactive strategies. It reveals certain realms that need to be studied on, including proposing generalizable researches that helps unify the theory, updating research data on specific contexts using URT, including more types of communication in the theory, and improving the modified URT framework in various communication environments. By doing so, it attempts to conclude current research trends in this field, inspiring future researchers to dive deeper into where research gaps exist. This article successfully extended the boarder of the objective of uncertainty as well as the scenarios that are explained by URT.

**Keywords:** Uncertainty reduction theory (URT), communication, review, interpersonal communication, crisis communication.

## 1. Introduction

Uncertainty means the absence of knowledge or predictable outcomes. Humans all live on the island of isolation amidst seas of infinity, and are therefore confronted with uncertainty from time to time. When it comes to communication, uncertainty is literally everywhere, as social interactions are naturally impossible to foretell. Troubled by the undesired effects or significant losses that might be caused by uncertainty, people are driven to wipe out uncertainty in the interactions they face. Since uncertainty is a fundamental characteristic of communication, researches on this topic can provide answers to a wide range of questions regarding communicative issues--when a merchant advertise something that one cannot confirm, when a dater is suspected to lie in his/her profile, or when one seeks information about the pandemic from the supposed reliable sources of information.

There seem to be few review papers in recent years that reflect on uncertainty reduction theory (URT), which highlights the need to analyze the application of URT basing on contemporary contexts. With URT gaining popularity in recent years, and its boarder being extended, it is of necessity to review on the literature regarding the application of URT. Prior researches in this field mainly apply this theory to explain uncertainty rising from three types of situations: (a) during an initial interaction between strangers, which is the original area that URT explains; (b) in an ongoing interpersonal relationship established between acquaintances rather than strangers; and (c) following a radical upheaval in the environment, which leads to the increase of uncertainty for URT to be applied.

This paper focuses on the application of URT in the field of communication in recent years. Through reviewing previous research, it is organized in this way: first, it explains concepts related with URT; then it reflects on the applications of URT in different scenarios proposed by previous researchers; finally, this paper provides practical suggestions on uncertainty reduction. By doing so, it attempts to conclude current research trends in this field, inspiring future researchers to dive deeper into where paucity of knowledge exists.

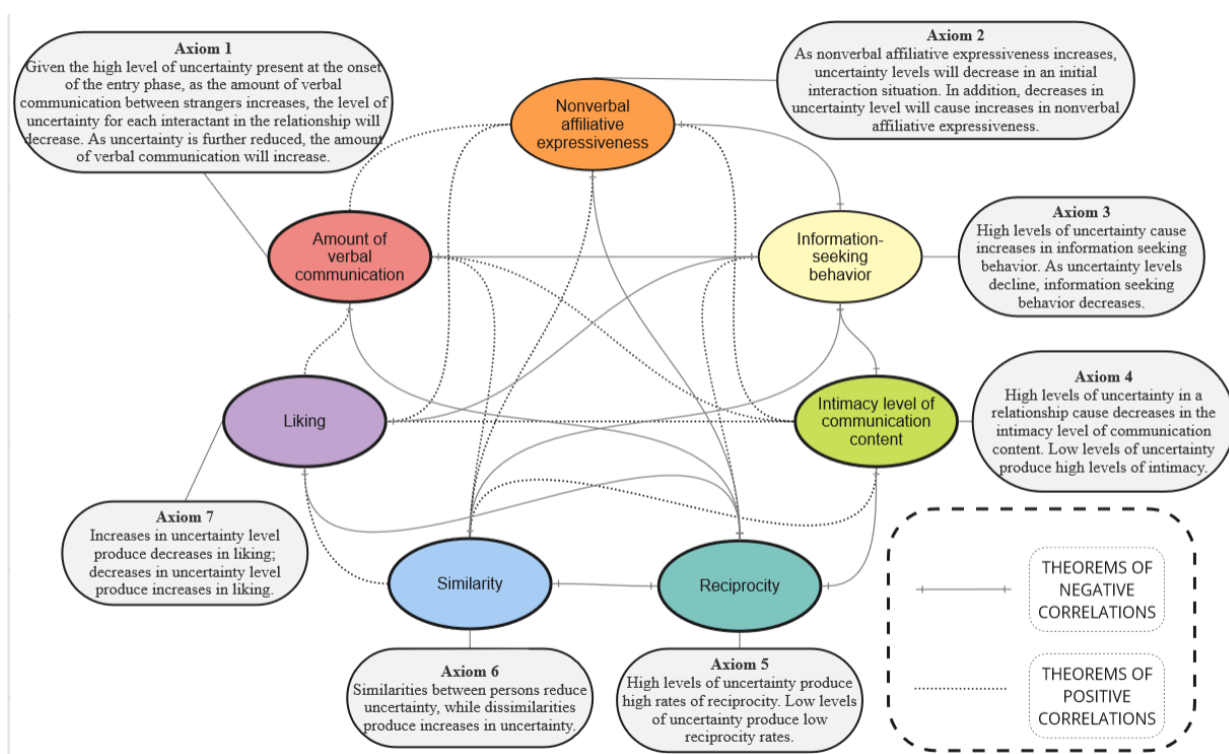
## 2. Uncertainty Reduction Theory (URT)

As a cognitive segment in which people contemplate various means to describe or foretell something, uncertainty is an incomplete state of knowledge or the unpredictability of one's actions

[1]. When confronted with uncertainty, it is human nature to be motivated to decrease uncertainty [2], which is where the theoretical framework comes in. According to uncertainty reduction theory (URT), certain principles for people’s interaction exist when someone cannot ensure the normality of the social circumstances [3].

Uncertainty comes in different types, including partner uncertainty, self-uncertainty, and relational uncertainty [1]. Partner uncertainty refers to one's incapability to foretell behavioral and mental reactions of someone else; self-uncertainty can result from a lack of relevant self-knowledge, meaning someone cannot describe, explain, or predict one’s own behaviors, ideas or emotions; relational uncertainty is, on the other hand, one’s dubiousness to foretell or interpret something connecting to a relationship.

Originally, URT was proposed to portray the initial communicative process between two strangers, with 7 variables, 7 axioms and 21 theorems as demonstrated by the following Figure 1 [4].



**Figure 1.** Original theoretical structures of URT

Over the years, however, URT has been expanded to explain more phenomena that exist in the modern society, with new axioms being added and existing axioms being challenged. First, the additional contexts where URT explains certain phenomena include interactions within established interpersonal relationships, propaganda, and how an entity react to the ever-changing environment. Second, along with the new contexts, more axioms have been added by researchers, such as the statement that "shared communication networks reduce uncertainty, whereas lack of shared networks increases uncertainty", which indicates the active strategy to gain information from a third party [4]. Third, as a falsifiable axiomatic theory, URT is actually not as fundamentally credible and thus by nature subject to objection. Besides, it also oversimplifies the world without considering intervening variables, such as the culture's variation in the tolerance of uncertainties [1].

### 3. The Possible Application of URT

When it comes to analyzing the situations that URT comes into use, a common categorization is based on the object of uncertainty, but in reality, different uncertainties are often tangled with each other (e.g., when hesitating about what to say to a potential partner, one is affected by both the uncertainty of her interests and the uncertainty of his manner), let alone that it ignores one's

uncertainty about the social environment (e.g., the pandemic). Another categorization is to examine the specific situations in which someone feels uncertain (e.g., online dating/post-disaster propaganda/job hopping), but this fails to touch the essence of the theory and might be subjective. Hence, this review suggests categorizing according to the communication contexts, i.e., the relationships from which uncertainties arise.

### **3.1. Uncertainty in Stranger's Formal Relationships**

This scenario corresponds the strangers' communication situation from which URT is proposed--when two foreigners interact for the first time.

In an entrepreneurial context, facing a work environment that implies uncertainty, entrepreneurs are supposed to exhibit more behaviors to reduce uncertainty, such as seeking feedback from employees [5]. With more information mastered, entrepreneurs are more capable in predicting behaviors and of employees, and thus reduce their uncertainty. When it comes to on-line shopping, a previous study in livestream fashion shopping investigated what sources that consumers use to reduce uncertainty in on-line shopping, identifying 3 sources that provide consumers with product-related information: the display of commodity, buyer-seller communication, and other buyers' comments on the commodity [6]. Information attainment helps a potential buyer to better understand the product of interest, and thus affects one's uncertainty as well as purchase intention. Another research dived deeper into one of the 3 information sources (comments from other customers), so as to find specific factors of on-line consumer comments that affect consumer attitudes about the product, changing one's uncertainty level [7]. Reflecting on URT, it identified the quality of comments, tendentiousness of comments, source integrity, augmentation of existing opinions, and recommendation degree as factors that are positively correlated with the uncertainty reduction of a potential buyer.

On a whole, previous researchers seemingly prefer to observe the interaction between targets with certain identities in specific scenarios (e.g., the buyer-seller communication, or the entrepreneur-employee communication). This is a strategic research method, partially due to the convenience in data collection--To scientifically investigate how strangers interact in everyday life, researchers are supposed to randomly select a number of targets and record their interactions that might start anytime, which would be not only too costly and time-consuming, but also accusable of violating the targets' privacy. To sum up, studies in uncertainty in stranger's official relationships, proven to be exceptionally useful in the interdisciplinary realms between communication and management, psychology or economics, have broadened the URT. However, one relevant shortcoming, the lack of unified theory, has also arose from their interdisciplinary nature. Future researchers should think of ways to investigate the initial interaction both conveniently and scientifically, rather than narrow down to a specific context.

### **3.2. Uncertainty in Ongoing Interpersonal Relationships**

Ongoing interpersonal relationships are not the field of communication that can be explained by URT, since ongoing relationships indicate that such connections have already existed before the interactions--so that the observed interaction is established not between strangers, but rather between acquaintances, such as daters or friends. However, as in suggested by Knobloch, the general principles of URT can explain many communication scenes beyond interaction between foreigners, since URT has been extended to involve communication in ongoing relationships between people [4].

A classic example of such ongoing relationships is the romantic relationships. Researches of adopting URT to examine romantic relationships began in the early days of 1980s [8]. Early researchers found that the more frequent does the respondent communicate with the dater and his/her acquaintances, the less uncertainty he/she feels--and the less likely will the partners break up Another research that adopted URT to explain romantic relationships are presented by Gibbs, Ellison and Lai [9]. The research investigated the uncertainty concerns in online dating contexts, which paid much attention to the connections between the valuation of secrecy, uncertainty reducing methods, and self-presentation of daters on the Internet. Generally, it was found that the frequency that an online

dating participant uses uncertainty reduction strategies serves as the mediator between the above factors and the extent of self-presentation between daters met online. Besides establishing such correlation, the study also concluded major strategies used by daters to reduce uncertainty. It was suggested that the most commonly used method was asking the partner questions, which was an interactive strategy to verify one's identity; whereas few participants Google the potential partner online, since the profile information is so limited that the dater's name itself might be unknown, proving Googling to be a useless active strategy. Not only have researchers use URT to explain romantic relationships, but they also apply it in the interpersonal interactions between friends, though the number of such researches is limited. Using college freshmen as the sample, Oktavianti and Loisa presented a study on the network structure and the role of dominant actors [10]. Although their main intention was to shed light on how college freshmen form and sustain networks, their research also contributes to URT in that it proves the correlation between networks of friendship and information uncertainty reduction, thus expanding the borders of URT.

In conclusion, researches in this field (uncertainty in intimate interpersonal relationships) tend to be scattered and incomplete. For the one thing, few recent studies have discussed uncertainty in romantic relationships, meaning the data related to daters appears to be outdated and needs to be kept up-to-date. For the other thing, the observed relationships fail to include other types of ongoing relationships, such as kinship and acquaintances, where future studies should work in.

### **3.3. Uncertainty in Relationships between an Entity and Environment**

URT is also applied to explain the uncertainty arising from the relationship between an entity (both individual and government included) and the environment. This type is actually concluded by the author based on recent researches. This paper found an inner correlation between the arising upheavals and the increase of uncertainty, which means that URT is an ideal theory to test in a changing environment application, with a wealth of contemporary studies in crisis communication have used URT to examine either international, regional and personal perspective in moments of crisis.

In moments of international crisis, uncertainty in earth residents soared up. The context of health communication has been mentioned frequently in the articles related to URT's application, especially after the outburst of COVID-19 pandemic. Faced with an unpredictable future, researchers worldwide began to apply URT to explain phenomena occurred during the pandemic, such as the government's coping measures [11] and the citizens' mental status [12]. Following the pandemic, URT was expanded to explain cases in crisis communication, focusing on the uncertainty of individuals who required medical aids and governments which worked on risk management. Due to social media's capability to disseminate information while minimizing uncertainty, research has been made about the uncertainty reduction strategies that the sampled students used to identify information on Instagram [11]. To be specific, based on the 3 stages of interpersonal communication that was concluded by URT, 3 stages of crisis communication can be identified according to the uncertainty levels the citizens felt. The research made by Grace et al. used URT to lay down guidelines to reduce uncertainty in each phase of the pandemic, explaining how organizations should modify their service protocols and communicative methods [13]. Since governments are mainly responsible for crisis management during the COVID-19, the use of URT in this research can be extended from organizational communication to governmental propaganda. In the entry stage, communicators should increase communication frequency and leverage familiar protocols; In the personal stage, communicators should recognize citizens' needs and create interactive opportunities between them; In the exit stage, communicators should make arrangements that define a new normal during the recovery phase and beyond. As for individual perspective, some researchers use URT to explain the psychological effects of the COVID-19 Infodemic [12]. They used a path model to test how social media usage is associated with uncertainty reduction strategies, leading to (a) preventive behaviors, which shows an inverse correlation with symptoms of mental health problems; and (b) emotional reactions, which is positively associated with mental disorders. Other researchers investigated how

people use COVID-19 tracking apps, suggesting that (a) such applications are fostered by uncertainty reduction measures, which involve the transparency of the disclosure, social influence and trust in government; and, in turn, (b) applying tracing apps affects people's perception of risks, although it cannot reduce the actual social risks or health-related concerns regarding the pandemic [14].

Similarly, apart from the health issues, crises in other areas have also been reflected on. For instance, the Syria War, which represents a seismic shift in the political process, has been used as a background to investigate the role medias plays in providing local people with information as well as affecting their mental status [15]. After assessing the relationship between information exposures and feelings of the victims, the results showed an obvious relationship that the longer someone spent on the press, the more optimistic one became. Nonetheless, one's degree of emphasis on the medias served as a moderator to this correlation, meaning the observed certainty of sources might affect how much knowledge someone obtained during the war. Additionally, some revulsion might exist in the individual's everyday life, instead of in a regional or international scale. For instance, when it comes to job-hopping, a study has been made on analyzing how educators reduce uncertainty while switching their jobs [16]. The answers are can be derived from URT, with both passive, active, and interactive strategies being witnessed when educators gather information about the new working environment [16].

Overall, the use of URT in scenarios with an entity and the environment has been gaining popularity worldwide, with significant strengths. Not only can it derive communication strategies to deal with problems in the real life, such as promoting adoption of COVID-19 tracing apps, but it also helps the entity to manage the uncertainty provided by the outside environment, for both governments and individuals.

#### **4. Suggestions on Reducing Uncertainty**

It is one of the main arguments of URT that the more the knowledge, the less the uncertainty. Consequently, when it comes to solutions to reduce uncertainties, knowledge acquisition should be of major concern. In fact, URT proposes three strategies to promote information acquisition and thus reduce uncertainty: passive, active, and interactive ones [1].

To begin with, a passive strategy means merely inspecting someone without factual engagement, which makes it occasionally preferable to many individuals who want to acquire information yet prevent incurring face threats. Another advantage is that when the observer keep himself/herself out of sight, the observed target is unlikely to notice observer's existence, so that the observer won't be deceived by the modified behaviors of the target. Nonetheless, no participation in any forms of interactions equals minimal control on what exactly one obtains from passive watching [4]. Additionally, active strategy indicates no direct interactions with the target, but some indirect ones, and therefore make overt attempts to collect information. The information seeker often searches online or ask others, yet a more strategic effort to secure information is to construct the environment, which involves manipulating one's surroundings, watching how the target person responses to the context, and thus deriving knowledge of one's opinion, sense of worth, or individuality. For instance, to figure out whether a roommate likes pets, going to his/her Facebook page and find out about his/her previous comments on pets can be useful, but it might also be deceiving, since there is no guarantee that the roommate tells the truth. Contrarily, an individual may want to take a walk with a roommate and pass by a pet store, his/her expressions when seeing the pets will not be as deceitful. Lastly, interaction strategy involves communicating directly with the target, seeking information along the way. Asking direct questions can be effective in gaining information, but it goes against common sense to question too much in an initial interaction, which is perceived as rude in many cultures. A better approach is to seek reciprocated disclosures during a conversation, since the exchange of self-disclosures is in line with social norms [1]. On a whole, interaction strategies rely heavily on one's communication skills, requiring people to incur substantial face threats, and is therefore unfriendly to some people.

## 5. Conclusion

The paper promotes the advancement of URT in these ways.

To start with, it successfully expands the boarder of the objective of uncertainty as well as the scenarios that are explained by URT. It investigates uncertainty reduction strategies as employed by individuals in a variety of circumstances, both online and offline, both acquaintances and strangers, both interpersonal communication and organizational communication (which, in this case, refers mostly to governmental propaganda). Rather than limiting to the scenarios of strangers interacting face-to-face for the first time, this article adopts a wider definition of "uncertainty", which further articulate the theory by extending its boarders. Moreover, it identifies significant knowledge gaps in the application research of URT, therefore encourage future researchers to narrow down such breaches. With an overall examination of past studies, as well as a prudent design of charts for future research, it uncovers areas where research is needed, including proposing generalizable research which contributes to unified theories, updating research data for certain contexts that use URT, including more types of communication in the theory, and refining modified URT framework in various circumstances. Finally, this paper draws implications for practice and future theorizing of URT. Theoretically, it summarizes existing knowledge regarding the framework of URT, creating a firm springboard for future researchers who might want to advance in this knowledge. Practically, it sheds light on information processing that people encounter randomly in daily life, so it is proved useful in helping people dealing with uncertainty more confidently, providing practical suggestions with different ways to deal with uncertainty--either passively, actively or interactively.

The current evidence, which strengthens a variety of communication circumstances where URT comes into use, has hints on where future studies could focus on. First, since researches on the application of URT in initial interpersonal communication often look at specific contexts, more researches that focus on either other unmentioned contexts or the overall initial communicative scenario are required, in order to enhance the generalizability of URT and thus reach unified outcomes. Second, as research data that examines uncertainty in ongoing romantic relationships tends to be outdated, researchers may want to generate relevant researches and apply URT to contemporary romantic relationships. Considering the trends that over the past decade, online dating has not only gained popularity but also improved and matured considerably, researches that use URT to explain online dating must be kept up-to-date with new development in communicative technologies and communicating behaviors. Last, researchers who intentionally used URT to explain different scenarios (e.g., cases of organizational communication or mass communication) tended to be introducing only part of the theory into new contexts, or taking the theory for granted without empirical examination. However, as URT is being applied to more types of communication beyond initial interpersonal one, its framework should be adjusted and refined accordingly with the wide range of circumstances. It is worth noting that the expansion of theory cannot exist singly without solid evidence, so that the feasibility of applying URT to other realms in communication should be tested scientifically, which is where future researchers might want to investigate.

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