



Research article

Social curiosity as a way to overcome death anxiety: perspective of terror management theory

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ABSTRACT

Social curiosity has been found to have great benefits in human life, especially in fostering interpersonal relationships. Nevertheless there is indication of other benefit of social curiosity that have not yet been explored, namely overcoming the anxiety of death. This indication is based on previous research which found a positive relationship between anxiety and social curiosity. In this study, social curiosity is framed as representation of symbolic immortality, which people use to overcome the terror of death. To support this conjecture, two studies were conducted using the Terror Management Theory (TMT) framework. Study 1 (N = 352, M age = 19.39) found a positive relationship between death anxiety and social curiosity. In Study 2 (N = 507, M age = 20.68) it was found that intolerance of uncertainty and desire for self-verification mediated the relationship between death anxiety and social curiosity. The results of this study indicate that increasing interest in obtaining information about how other people think, feel, or act is a form of mechanism used by people to control anxiety related to death.

1. Introduction

Social curiosity is defined as an interest to obtain new information and knowledge about the social world (Renner, 2006). This type of curiosity is widely known to have an important role in social interaction and human relations (Han et al., 2013; Hartung and Renner, 2013; Kasdhan et al., 2018). Social curiosity enables individual to make more accurate personal judgments about his/her interaction partners (Hartung and Renner, 2011). As such social curiosity increases one's ability to adapt and to survive. Although the importance of social curiosity has been explored in past literatures, there is a wide dearth of research on the antecedents of social curiosity as well as the mechanism between those antecedents and social curiosity. These series of study aimed to examine social curiosity based on the framework of the Terror Management Theories, abbreviated as TMT (Pyszczynski et al., 1997).

2. Terror management theories (TMT)

Based on TMT, human psychological needs are primarily rooted in existential dilemmas (Pyszczynski et al., 1997). People are born with instinctive tendencies for self-perseveration and continued existence to

increase the chances of survival (Greenberg et al., 1997). People are equipped with intellectual abilities making them aware of their unavoidable vulnerability and death (Rosenblatt et al., 1989). The awareness that they are vulnerable is potential to create a paralyzing terror. The term terror refers to the emotional manifestation of the self-preservation instinct in people who are intelligent enough to know that one day they will die (Greenberg et al., 1992). This intense anxiety experience is potential to disrupt people in living their life. Thus, people need to be able to control this existential anxiety (Hayes et al., 2008; Hormone-Jones, Simon, Pyszczynski, Solomon and McGregor, 1997).

TMT postulates that people use a dual component as cultural anxiety buffer. The first of dual component is cultural worldview, a set of standards that are valuable that provides explanation about existence. The second is self-esteem, people obtained by believing that a person meets the value standards in the cultural worldview that he/she holds (Greenberg et al., 2000). Cultural worldview and self-esteem are symbolic forms of immortality. As symbolic immortality, cultural worldview and self-esteem enable people to feel valuable as part of something bigger, more significant, and lasting longer than human existence (Dechesne et al., 2003).

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3. Social curiosity as representation of symbolic immortality

Symbolic immortality is a psychological device to overcome the terror of death (Florian and Mikulincer, 1998). Symbolic immortality can be explained as a universal drive to maintain a continuing sense of symbolic connectedness, over time, space, with various elements of life (Lifton, 1975). People believe that after physically dying some valuable aspects of themselves will continue to exist, either literally, such as in heaven, or symbolically, such as self-prolongation through their children or their eternal achievements (Burke et al., 2010; Dewa et al., 2014). Symbolic immortality can be expressed in five ways, which are biological, creative, transcendental, natural, and experiencing transcendence (Lifton and Mitchell, 1996).

Biologically expressing immortality does not necessarily refer to family continuity. It can also refer to social group attachment. People can also experience social death if they receive rejection, exclusion, or neglect from their social environment (Steele et al., 2014) leading to existential anxiety. Managing existential anxiety can be achieved through forming connecting to the social world (Steele et al., 2014). One way to form connection is by getting information about other people. Hence social curiosity is a prerequisite in interpersonal relationships, because it helps to build and maintain interpersonal relationships (Renner, 2006; Hartung and Renner, 2011; Hartung and Renner, 2013; Hartung and Renner, 2013; Kasdhan et al., 2018). As such social curiosity is representation of symbolic immortality due to its role in adaptation and survival.

4. Death anxiety

Death makes people experience uncertainty because they do not know when and how death occurs (Greenberg et al., 1994). Death is the only event that cannot be avoided in the future, which will kill human motivation and desire (Greenberg et al., 2010). As such, death creates extraordinary anxiety resulting in terror to human life (Hayes et al., 2008). Death anxiety is a result of people living in the shadow of death. Death anxiety exists in various cultures and is the main motivation in human behavior (Cicirelli, 2002). Past studies have found the relation between anxiety and curiosity. Studies conducted by Trudewind (2000), Litman and Pezzo (2007) found positive relationship between anxiety and curiosity; thus, indicating the tendency of people to seek social information when experiencing anxiety. As such, seeking interpersonal information helps anxious people to regain control of their environment (Renner, 2006). Based on the above findings, it can be argued that death anxiety leads people to engage in social curiosity – urging people to collect social information - as a way to mitigate the death anxiety.

5. Intolerance of uncertainty

Intolerance of uncertainty is seen as a broad construct that represents cognitive, emotional, and behavioral reactions to uncertainty in everyday life situations (Freeston et al., 1994). Intolerance of uncertainty is explained as an excessive tendency of individuals to consider negative events that occur unacceptable, however small the possibility of the occurrence (Buhr and Dugas, 2002). Lowe and Harris (2019) found a positive relationship between death anxiety and intolerance of uncertainty. It might be that death anxiety creates unpredictable situation, in which people live in limbo. Living in limbo triggers cognitive, emotional, and behavioral reactions. Hence, death anxiety stimulates intolerance of uncertainty.

Experiencing intolerance of uncertainty enables people to take action in overcoming the terror of death. Intolerance of uncertainty arises because uncertainty is unacceptable, causing stress and must be avoided as uncertainty triggers frustration and prevent action (Buhr and Dugas, 2002). In intolerance of uncertainty, efforts are drawn to control the future and avoid uncertainty (Freeston et al., 1994). Intolerance of uncertainty encourages people to take action. However intolerance of

uncertainty can also increase worry (Ladouceur et al., 2000). This worry occurs because the intolerance of uncertainty makes people feel uncertain about many aspects of their lives (Buhr and Dugas, 2002). Hence, intolerance of uncertainty makes self-concept unstable (Kusec et al., 2016). To maintain stable self-view, people need to make their self-concept stable. One way is by doing self-verification (Swann et al., 1989).

6. Desire for self-verification

Self-verification refers to a very strong desire to obtain confirmation and stabilization of one self-view (Kwang and Swann, 2010). Through self-verification, people are more coherent about themselves (Swann and Buhrmester, 2003). This psychological coherence is interpreted as the feeling that the self and the world are as expected (North and Swann, 2009). People use social interaction as means to verify and confirm their self-concept (Swann and Read, 1981). Desire to self-verify motivates people to intensively seek information that confirms their beliefs (Swann et al., 1981). Whether or not it is realized, people construct a self-confirmatory social environment. People will selectively choose to interact with those who can provide self-verification (Swann and Buhrmester, 2003). Through this selective social interaction, people gain self-view (Kwang and Swann, 2010; Swann et al., 2007).

Selective social interaction can be achieved when people know who they can depend on, including those who are supportive of one's self-view. In order to gain this knowledge, people need to have social curiosity. Social curiosity enables people to obtain information about other people, including their interest (Renner, 2006). Therefore, social curiosity helps people to make accurate judgments about other people (Hartung and Renner, 2011) as it facilitates understanding of social information (Hartung and Renner, 2013).

7. Present research

Information about people is a very valuable resource to have (Han et al., 2013), as it will facilitate survival and adaptation, therefore it is very important for people to develop and/or increase social curiosity. In order to increase social curiosity, it is necessary to know the antecedents of social curiosity. There has been an attempt to explain the causes of curiosity in general by Loewenstein (1994). Information gap theory explains how curiosity is a form of cognitive deprivation that occurs because of gaps in knowledge or understanding. This theory has been used extensively in various studies on curiosity. However, information gap theory is not appropriate when used to explain the causes of social curiosity. Information about people is different from other types of information, because the former is complex and has special value in the social environment, for example as a social comparison (Litman and Pezzo, 2007). Characteristics of information about people that are different from other types of information indicate that people's motives for obtaining information about other people are not just to meet the information gap.

This study proposes on understanding social curiosity from other perspective, namely by looking at social curiosity using the TMT framework. The ability of TMT to explain various human behaviors has been proven. This theory can explain behavior by looking at people's most basic motives, namely the conflict between life and death (Basset, 2007; Echabe and Perez, 2016; Greenberg et al., 2010; Pyszczynski, Greenberg, & Solomon, 1997), the urge to survive despite knowing that at any time people will die, driving people to create a symbolic immortality (Florian and Mikulincer, 1998). In this study, social curiosity is proposed as a form of symbolic immortality that people try to attain. To prove the use of social curiosity as a form of symbolic immortality in dealing with death anxiety, two studies will be conducted. Study 1 is the fundamental research needed to empirically prove the relationship between death anxiety and social curiosity. Study 2 is needed to explain in detail the process of how death anxiety can increase social curiosity. In

Study 2 the relationship between death anxiety and social curiosity will be proven through two mediators, namely intolerance of uncertainty and desire to self-verification. These two variables are chosen because they are correlated with death anxiety and social curiosity. In addition, these two mediators' function to provide an explanation of how personal death anxiety can direct people's attention to their social environment.

8. Study 1

The purpose of Study 1 was to examine the relationship between death anxiety and social curiosity. Previous studies have examined the relationship between anxiety-as trait anxiety or social anxiety- and social curiosity (Renner, 2006). However, inconsistent results among past studies between anxiety and social curiosity are prevalent. Anxiety was found to be negatively correlated with curiosity (Kasdhan, 2002, 2007; Kasdhan and Roberts, 2004; Kasdhan, Rose and Fincham, 2004). On contrary, anxiety was also found to be positively correlated with curiosity (Litman and Pezzo, 2007; Trudewind, 2000; Renner, 2006). Furthermore, no previous studies have been noted by the authors on the relationship between death anxiety and social curiosity. Considering that death anxiety could be postulated as precursor for social anxiety based on the TMT framework, Study 1 aimed to examine the relationship between death anxiety and social curiosity.

8.1. Methods

8.1.1. Participants and procedures

The participants (N = 352) were undergraduate students majoring in Psychology from private university in Jakarta Greater Area, Indonesia. Initially there were 355 participants, but three participants were eliminated. One participant was eliminated for not filling out the questionnaire, and the other two were eliminated due to their age being vastly different to the other participants. The participants consisted of 81% female (n = 285); and the age mean, M = 19.39. Data was collected by distributing the research questionnaires in classes. Prior to data collection, this study was granted by Ethics Committee of Psychology Faculty of Universitas Indonesia. Informed consent was obtained at the beginning of the study measurement.

8.1.2. Measures

8.1.2.1. Revised death anxiety scale (RDAS; Thorson and Powell, 1992). Death anxiety was measured using the revised death anxiety scale. The RDAS was chosen as measure of death anxiety based on study conducted by Cicirelli (2002), in which death was made salient and the fear of death was raised at the level of consciousness through the utilization of death anxiety measure. The RDAS consisted of 25 items with a 5-point Likert scale ranging from 1 (strongly disagree) and 5 (strongly agree), with 25 and 125 for minimum and maximum scores, respectively. An example of RDAS item was 'The total isolation of death is frightening to me'. Higher RDAS score indicated more anxious about death.

8.1.2.2. Social curiosity scale (SCS; Renner, 2006). SCS was used to assess social curiosity. It aimed to determine the level of interest that an individual had on how others thought, felt, or acted. The SCS consisted of 10 items, rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). An example of this item was 'I like to look into other people's lit windows'. Scoring was done by totaling the answers on all items. Higher SCS score indicated a higher interest in obtaining information about other people.

8.1.3. Statistical analysis

The IBM SPSS ver. 25 was used for statistical analyses (IBM Corp, 2017). Reliability analysis was computed to determine reliability coefficient for each measure. Bivariate correlation among variables were

determined using the Pearson correlation, and hierarchical regression analysis controlling for gender was used to examine the relationship between the predictor and outcome. Gender was controlled as it might influence social curiosity, as well as research conducted by Taubman-Ben-Ari et al. (2002).

8.1.4. Results

Means, standard deviations, Cronbach's alphas, and bivariate associations among variables are presented in Table 1.

The reliability of death anxiety scale and social curiosity were acceptable. Positive correlation between death anxiety and social curiosity was found, higher death anxiety was related with higher curiosity. Gender did not have a significant relationship with social curiosity, but it had a significant negative correlation with death anxiety. Women had higher death anxiety score than men.

From Table 2 it can be seen that gender did not significantly predict social curiosity. The addition of death anxiety significantly improved the model. Death anxiety explained 2.7% increase in variance in social curiosity. In this model death anxiety ($\beta = .175; p < .01$) was a better predictor of social curiosity than gender ($\beta = .112; p < .05$).

8.2. Discussion

The results of Study 1 supported findings from previous studies in which anxiety predicted curiosity (Litman and Pezzo, 2007; Trudewind, 2000; Renner, 2006). In particular, this study provided preliminary evidence of the positive association between death anxiety and social curiosity. This result served as a basis to further illuminate the role of social curiosity as mechanism to mitigate the impact of death anxiety.

In addition, gender was found in predicting social curiosity. Although this happens if death anxiety becomes the antecedent of social curiosity. Gender had a correlation with death anxiety. In this study it was found that women have higher death anxiety than men. These results were in line with previous studies (Abdel-Khalek and El Nayal, 2019; MacLeod et al., 2016; Pierce et al., 2007; Russac et al., 2007).

9. Study 2

The purpose of Study 2 was to examine intolerance of uncertainty and self-verification as mediators in the relationship between death anxiety

Table 1. Mean, standard deviation, Cronbach's alpha coefficients, and Pearson's correlation.

Variable	1	2	3	4
1. Gender	-			
2. Age	-	-		
3. Death anxiety	-.337***	.001		
4. Social Curiosity	.053	-.057	.137**	
Mean	19	19.39	79.13	26.72
SD	-	-	14.29	4.86
α	-	-	.84	.75

Note. N = 352.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2. Hierarchical regression model of social curiosity.

	R	R ²	R ² Change	B	SE	β	t
Step 1	.053	.003					
Gender				.661	.660	.053	1.001
Step 2	.173	.030**	.027**				
Gender				1.388	.693	.112*	2.004
RDAS				.062	.020	.175**	3.118

* $p < .05$; ** $p < .01$; *** $p < .001$.

and social curiosity. Within the TMT framework, various human behaviors, such as aggression, prosocial behavior, sexual attitudes, are motivated by fear and anxiety of death (De Wall and Baumeister, 2014). This indicates that there are many ways to control the anxiety of death. Thus Study 2 was conducted to understand social curiosity as mechanism in mitigating death anxiety. In addition, this research is needed to strengthen the results in Study 1 by explaining how the process of death anxiety can increase social curiosity.

9.1. Methods

9.1.1. Participants and procedures

The number of participants in Study 2 was 507 people. Initially there 511 participants recruited. However, four participants did not meet the inclusion criteria, which is undergraduate students. Data were collected by distributing online research questionnaires to undergraduate students in Jakarta, Indonesia. The age of the participants ranged from 18 to 25 years (Mean: 20.68). There were 368 (72.6%) female participants in this study. Prior to data collection, this study was granted by Ethics Committee of Psychology Faculty of Universitas Indonesia. Informed consent was obtained at the beginning of the study measurement.

9.1.2. Measures

9.1.2.1. Revised death anxiety scale (RDAS; Thorson and Powell, 1992) was the one used in study 1. This instrument consisted of 25 items, rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Item example was 'I fear dying a painful death.' Higher RDAS score indicated more anxious about death.

9.1.2.2. Intolerance of uncertainty (IUS; Buhr and Dugas, 2002). It was a measure based on the idea that uncertainty was unacceptable and should be avoided, being uncertain reflects badly on people, creating frustration, stress, and fostering inability to take action. IUS consisted of 27 items, rated on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly Agree). Item example was 'uncertainty stops me for having a strong opinion'. Higher IUS total score indicated a higher inability to tolerate uncertainty.

9.1.2.3. Desire for self-verification (Wiesenfeld et al., 2007) assessed self-verification for personal self. This measurement consisted of 2 items. Item example of this measurement was 'I want others to understand who I am'. The measure was rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The Cronbach's alpha value of this measuring instrument was $\leq .7$ Although the alpha coefficient was less than 0.7, this Cronbach's alpha value was adequate for research on human behavior (Vaske et al., 2017). Higher total score indicated stronger impetus for personal self-verification.

9.1.2.4. Social curiosity scales (SCS; Renner, 2006) used in study 2 was the same as the one in study 1. SCS consisted of 10 items. Item example was 'I am interested in people'. It was rated on a 4-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Higher score demonstrated growing interest in obtaining information about other people.

9.1.3. Statistical analyses

The IBM SPSS ver. 25 was used for statistical analyses (IBM Corp, 2017). Reliability analysis was computed to determine reliability coefficient for each measure. Bivariate correlation among variables were determined using the Pearson correlation. PROCESS macros for SPSS (version 3.4, model 6; Hayes, 2018) was used for mediation analysis.

9.2. Results

Means, standard deviation, Cronbach's alpha, and bivariate association of all the main variables in this study are shown in Table 3. The four variables in Study 2 were correlated with each other. Consistent to Study 1, death anxiety was positively correlated with social curiosity.

Gender was in the mediation model serial analysis as covariate. This was based on the results of Study 1 and the results of bivariate correlations in Study 2. Mediation analysis with intolerance of uncertainty and intolerance of uncertainty as mediators 1 and 2, and gender as covariate was performed. The analyzes used PROCESS macros for SPSS with bootstraps samples 10000 with 0.95 confident intervals. The results can be found in Figure 1.

Based on the results, it was found that intolerance of uncertainty and desire for self-verification significantly mediated ($p < .001$) the relationship between death anxiety and social curiosity. Higher death anxiety led to higher intolerance of uncertainty ($p < .001$), then higher intolerance of uncertainty significantly led to stronger desire for self-verification ($p < .001$). Eventually, stronger desire for self-verification led to higher social curiosity ($p < .001$). The relationship between death anxiety and social curiosity can also be mediated directly by intolerance of uncertainty ($p < .05$) and by desire for self-verification ($p < .001$). In this mediation model, gender was not significantly found to have influence.

9.3. Discussions

The results of Study 2 provided more support for the positive relationship between death anxiety and social curiosity. Intolerance of uncertainty and desire for self-verification was found to serially mediate the relationship between death anxiety and social curiosity. Death anxiety drove individuals to face the unknown that gave rise to intolerance of uncertainty. Experiencing intolerance of uncertainty motivated individuals to verify themselves in the form of tendency to know about other people, hence social curiosity. These findings were valuable to understand the mechanism from death anxiety to social curiosity.

Table 3. Descriptive statistics, mean, standard deviation, Cronbach's alpha coefficients, and Pearson's correlation.

Variable	1	2	3	4	5	6
1. Gender	-					
2. Age	-					
3. Death anxiety	-.149***	-.101*				
4. Intolerance of Uncertainty	-.129**	-.034	.456***			
5. Desire for self-verification	.041	-.089*	.184***	.248***		
6. Social Curiosity	.050	.022	.191***	.260***	.253***	-
Mean	20.68	.27	79.05	91.39	10.23	26.63
SD	-	-	16.15	17.27	2.42	5.34
α	-	-	.89	.92	.65	.79

Note. N = 507.

* $p < .05$; ** $p < .01$; *** $p < .001$.

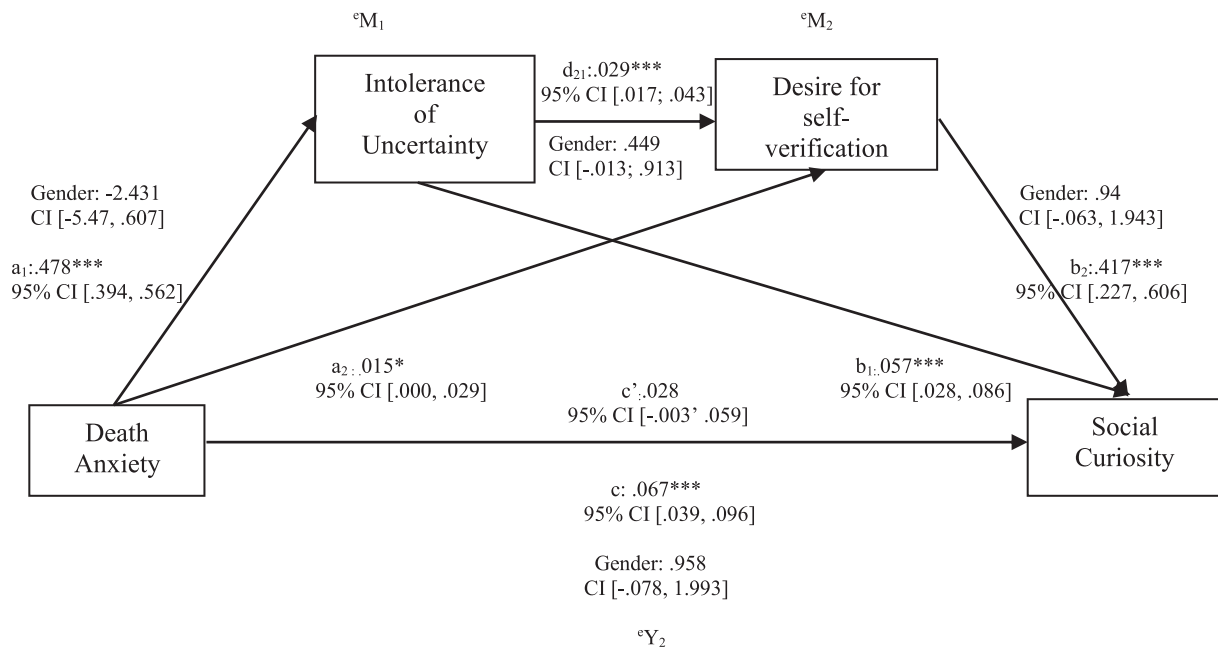


Figure 1. Serial mediation model study 2, intolerance of uncertainty and desire for self-verification as mediators between death anxiety and social curiosity (*: $p < .05$, **: $p < .01$, ***: $p < .001$).

Separately, each mediator can mediate the relationship between death anxiety and social curiosity. Intolerance of uncertainty can directly mediate the relationship between death anxiety and social curiosity. Likewise, with the desire for self-verification. In addition, gender was found to not affect the relationships between variables formed in this model. This finding reinforced the results of research conducted by Taubman-Ben-Ari et al. (2002).

10. General discussions

The current study examined the role of social curiosity as a mean in overcoming or reducing anxiety, particularly death anxiety. Empirical results in Study 1 supported that death anxiety increased social curiosity. These results were further strengthened in study 2, in which higher death anxiety led to stronger social curiosity through intolerance of uncertainty and desire for self-verification. Thus, based on these two studies, it can be concluded that social curiosity has the potential as a mean to overcome death anxiety.

As a representation of symbolic immortality, social curiosity had characteristics that buffer death anxiety. Memories about death make people feel uncertain, because death cannot be predicted (Nyatanga and De Vocht, 2006), which then raises the anxiety related to death. When people experience death anxiety, then negative effects rise in the form of fear, threat, unease, and discomfort (Nienaber and Goedereis, 2015). Experiencing these various discomforts make people unable to tolerate uncertainty and try to reduce it by increasing the drive to believe in immortality (Conn et al., 1996). One form of symbolic immortality is biological symbolic immortality. Symbolic immortality manifest in feeling of connectedness with other people and larger entities (Steele et al., 2014). This connection makes people no longer have fears that after death no one will know them and leave no impression in this world (Mikulincer et al., 2003). To achieve this symbolic immortality, people need to have good self-view. Having a stable self-view is important as it leads to feeling confident, then increase the ability to predict and control the social world, to direct behavior, and to maintain a sense of coherence, place, and continuity (Swann and Buhrmester, 2003; Swann and Read, 1980). Whereas threatening conditions make people have doubts about themselves and increase needs to reconfirm self-view through self-verification (Swann and Brooks, 2012). Even so people have hope

that they will be remembered based on others' impression of them after death. People are specific on the impressions that they want to be remembered on. Thus, self-verification is important, as they will try to receive social feedback that confirms their conceptions (Swann and Read, 1980). One way that can be done is to interact with people who support their conceptions (Swann and Buhrmester, 2003). Developing an interest in obtaining social information necessitates people to recognize the supportive people around them. However, social curiosity is not only driven by the need to be selective in making contact, but it is also driven by the need to achieve biological symbolic immortality. Social curiosity helps people to establish and maintain relationships with others (Renner, 2006), thus people continue to feel as part of a larger entity. Simultaneously social curiosity is also useful to maintain extant connection as it helps to constantly update with other people's conditions. Having a connection with social group will provide a collective social identity and provide symbolic immortality at the biosocial level (Lifton & dan Olson, 1974; Vigilant and Williamson, 2003). When people continue to develop social curiosity, people need not to worry too much about death because they will still be known even after death. Based on the explanation above, it can be said that social curiosity is the core of biological symbolic immortality actualization.

From the results of Study 1 and Study 2 it can be concluded that social curiosity is indirectly driven by death anxiety and directly by desire for self-verification. These findings show that the interest in obtaining information about others is fundamentally driven by the need to overcome death anxiety and is directly driven by the need for self-verification. This research illustrates how death anxiety can change the focus of people's attention. Initially the anxiety of death makes people only focus on themselves, that is, what is felt and thought about themselves when thinking about death. Then this death anxiety moves people to focus on others, to overcome the anxiety they have. Directing attention to others based on beliefs the importance of others in the existence of his life. The direct influence of desire for self-verification on social curiosity also provides specifications about increasing social curiosity. There are three motives underlying social curiosity, namely obtaining information or for learning, having control over their social environment, building and maintaining relationships with others (Hartung and Renner, 2011). Desire for self-verification is a depiction of one of the three motives, namely having control over their environment (Swann et al., 1981).

The direct influence of desire for self-verification on social curiosity in this study indicates that other variables can also have a direct effect on increasing social curiosity. This is very possible considering the desire for self-verification only describes one of the three social curiosity motives. In addition, although in this study desire for self-verification proved to have sufficient effects to increase social curiosity, the effect of intolerance of uncertainty on desire for self-verification was not strong. This means that it is probable that there are other variables that are potentially stronger as mediator between intolerance of uncertainty and social curiosity. Based on previous research, the potential mediator is social comparison. Intolerance of uncertainty can predict social comparison (Butzer and Kuiper, 2006). The process of social comparison includes the desire to affiliate with others, the desire for information about others, and self-evaluation (Taylor and Lobel, 1989), so as to encourage increased social curiosity.

An interesting finding in this study is death anxiety which correlates with total social curiosity. Previous research by Renner (2006) found that neuroticism and social anxiety only correlated with sub-factors of SCS (neuroticism was positively correlated with covert social curiosity; social anxiety positively correlated with social covert curiosity and negatively correlated with general social curiosity). Although death anxiety, social anxiety, and neuroticism are different variables, but all three are related because they contain an element of anxiety. Neuroticism correlates with death anxiety (Abdel-Khalek, 1986; Frazier and Foss Goodman, 1988; Templer, 1972). In neuroticism, there is acute anxiety (Soto et al., 2011), therefore neuroticism is often used to represent anxiety. Social anxiety is basically rooted in death anxiety. Fear of death is at the core of psychological threats (Landau et al., 2010), in so death anxiety underlies various kinds of anxiety and phobias (Furer and Walker, 2008). People who have social anxiety actually experience death anxiety. Social anxiety occurs because people are afraid of getting negative ratings from others when in social situations (Beidel et al., 1985). On the other hand, people with social anxiety have poor social performance that gives rise to negative responses from others, so they can experience social rejection (Voncken et al., 2008). When experiencing social rejection, the person actually has experienced social death (Steele et al., 2014). The similarities between death anxiety, neuroticism and social anxiety, which represent anxiety, should make the results of this study not much different from previous studies. Starting from this assumption, the difference between the results of this study and the previous research needs to be explained. This difference can occur influenced by cultural factors. This research was conducted in a country with a collective culture. In a collective culture there is a great need for social information so that they are still considered part of the group. In order to avoid exclusion or rejection from the group, all strategies for obtaining information about other people will be used to stay 'connected' to the group. People in a collective culture are motivated to find ways to adapt to others who are relevant, to fulfill obligations, and to be part of various interpersonal relationships (Markus and Kitayama, 1991).

The role of gender in predicting social curiosity models is still questionable, as such, gender does not correlate directly to social curiosity. However, when gender is included in a model that explains the occurrence of social curiosity using death anxiety, gender is found to have a role. However, it turns out that gender does not always have a significant influence in every relationship between death anxiety and social curiosity. Gender can influence social curiosity if: 1) death anxiety is used as an antecedent of social curiosity, 2) there are no other variables that mediate the relationship between death anxiety and social curiosity.

10.1. Limitations and future directions

This study uses a correlational method to prove the usefulness of social curiosity as a means of overcoming death anxiety. This is based on previous research conducted by Cicirelli (2002). Measurement of death anxiety at the level of awareness can contribute to TMT, because it becomes an extension of the TMT idea. However, this study cannot be used

to make inference about causal relationship between death anxiety and social curiosity. Thus, further research is recommended to use experimental design. Further research can be directed to prove that the fulfillment of social curiosity can indeed reduce death anxiety. This direction is in line with the aims of supporting the TMT premise, that is if a psychological mechanism can buffer death anxiety, then reminding individuals of death will increase reliance on that psychological mechanism; and strengthening this structure should reduce the attention and accessibility of thoughts related to death (Yaakobi, 2015).

In the future, experimental research can also be complemented by the use of Agent Based Models (ABM). Research on TMT using ABM can be found on papers by Shults et al. (2017); Shults et al. (2018). Agent Based Model (ABM) is a new method of experimentation. ABM is a simulation of large numbers of autonomous agents that interact with each other and with an environmental stimulus and observation of patterns that emerge from the interactions that occur (Smith and Conrey, 2007). If ABM is used, the agent can be taken at the individual level, which has a role based on the level of intolerance of uncertainty and desire for self-verification. The agent will interact with the environment, which is designed to cause death anxiety. Interaction between agents and their environment is useful for knowing whether social curiosity is present or not. ABM is useful for testing and developing theories (Smaldino et al., 2015). This study seeks to provide a new perspective in understanding social curiosity, which is using TMT to understand the mechanism of social curiosity. It is expected that the use of ABM can further support the use of TMT in explaining social curiosity. Despite its advantages, ABM also has weaknesses in external validity, so this method will be more effective if it is equipped with direct experiments (Jackson et al., 2017). ABM itself serves as a complement to traditional or laboratory experiments (Eberlen et al., 2017).

In this study the effect of death anxiety on social curiosity, both directly and through mediators, was weak. However, there is an increased effect of death anxiety on social curiosity if accompanied by mediators. This shows that there needs to be a mediator in the relationship between death anxiety and social curiosity. Based on the results of this study, future studies can explore other variables that might strengthen the effects of death anxiety on social curiosity. Research that specifically addresses social curiosity is still limited, so it cannot be concluded clearly which variables have a major influence on social curiosity. As a guideline, the motives underlying social curiosity can be used, namely, to obtain information, build and maintain interpersonal relationships, and control the social environment (Hartung and Renner, 2011).

Future studies can consider involving cultural factors in research on social curiosity. The difference in the results of this study, which found a correlation of anxiety components with total social curiosity, with previous studies, which found anxiety components only correlated with sub-factors of social curiosity (covert social curiosity), could be caused by cultural factors. This assumption must, of course, be verified. Comparing social curiosity in two different cultures will be very useful to better understand the construct of social curiosity, especially about the benefits and expressions of social curiosity in each culture. The importance of involving culture in curiosity research was also raised by Birenbaum et al. (2019).

11. Conclusions

This research has successfully demonstrated benefits of social curiosity, that is to reduce or overcome the anxiety of death. In particular, the benefits of social curiosity that are widely known, namely, to form and maintain interpersonal relationships (Renner, 2006), are part of the more basic benefits of overcoming death anxiety. Death awareness is critical motivation that becomes a driver in human behavior (Vail et al., 2012).

This research contributes to enrich understanding of the social curiosity construct. This is very useful considering that research that specifically addresses social curiosity is still very limited. In addition, this study

also provides a new perspective to explain the occurrence of curiosity, especially social curiosity. The occurrence of curiosity is mostly explained using gap information theory (Loewenstein, 1994), but here it is proven that social curiosity can also be explained using the TMT framework. The results of this study also strengthen TMT. This theory states that reducing or overcoming anxiety becomes a basic motivation in people (Echabe and Perez, 2016; Greenberg et al., 2010; Pyszczynski, Greenberg and Solomon, 1997). This research succeeded in proving that social curiosity is driven by death anxiety.

Declarations

Author contribution statement

R. A. Fitri: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

S. R. Asih: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

B. Takwin: Conceived and designed the experiments; Analyzed and interpreted the data.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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