

Explicating Curiosity via Uncertainty and Interest, Augmented with Open-Mindedness

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Received 1 Dec 2014 Accepted 31 Dec 2014

Abstract — The objective of this paper is to raise a challenge to Ilhan Inan's claim (2013) that an agent's *curiosity* ceases when the agent is firmly *certain* about the object of curiosity that is of *interest* to him, and to supplement his account by appealing to an aspect of curiosity that Inan overlooks substantively: *open-mindedness*. To achieve this objective, I first provide a brief summary of Inan's claim that an agent's *curiosity* is directly proportional to his *interest* and *uncertainty*, and inversely proportional to *evidence* and *belief*. Second, I discuss my objection to an aspect of Inan's claim that firm *certain* and (high) *interest* yields *no curiosity*. In ordinary enquiries or cases of propositional curiosity (e.g., whether questions), Inan's claim that firm *certain* extinguishes *curiosity* is convincing. However, there can be objectual curiosity cases (e.g., what questions) where Inan's claim may not be sufficient. Moreover, in many academic enquiries, a scientist may remain motivated to expend extra epistemic and cognitive capital, despite his firm *certain* about his once imaginable aspects of the object of curiosity, for the sake of unimaginable possibilities. Fueled by his continued curiosity, it is not uncommon for a scientist to take self-initiatives and reconsider propositions he was once certain about. Based on his past experiences, he might have learned that *certain* is generally impermanent and does not always last forever, which could keep his *curiosity* and hence the possibility of discovering more truths alive. Third, I present a number of rebuttals to my objection and show how they fall short of supporting Inan's account including the role of other feelings such as fear and anxiety about losing face, and knowing but being subjectively uncertain, which may motivate continued *curiosity* even when the agent is firmly *certain*. Fourth, I suggest an alternative view by adding *open-mindedness* to Inan's curiosity formulation that could help exculpate my objection. Instead of Inan's proposition, I suggest that one can remain *curious* about an objective he is *interested* in, despite being *certain* about it, when he is *open-minded*. (Baehr, 2012) *Open-mindedness* is a facilitating virtue and an activity that is a cognitive moving beyond or transcending of the person's doxastic commitments, thus facilitating *curiosity*. *Open-mindedness* assists in keeping the agent's *interest* and *uncertainty* alive, and helps freeing the mind beyond default beliefs and binds of certainty.

Keywords — *Curiosity, Ilhan Inan, Uncertainty, Open Mindedness, Baehr.*

I. INTRODUCTION

Epistemologists have recently started to pay more attention to curiosity, its pertinence to intellectual traits, and how to examine the role of curiosity in the acquisition of knowledge. Both psychology (Loewenstien, 1994) and philosophy (Inan, 2012) view curiosity as a basic motivator of knowledge. Psychological accounts of curiosity focus on its phenomenology and role in cognition. Philosophical accounts of curiosity emphasize its epistemic achievements. Epistemic curiosity addresses the connections between curiosity and epistemic inclinations and accomplishments; and it does so by examining the role of curiosity in appraising epistemic states and processes through such factors as uncertainty, interest, awareness of our ignorance, belief, evidence, acquaintance, and other elements standing between an agent and an object of his curious enquiry¹.

The aim of this paper is to raise a challenge and offer a modification to rectify Ilhan Inan (2013) proposition that an agent's curiosity ceases when the agent is interested and firmly certain about the object of his curious enquiry. Structure of the paper is as follows:

First, I provide a brief argument construction pertaining to the relationship between uncertainty, interest, and curiosity posited by Inan (2013) in his "curiosity, belief, and acquaintance" essay. This paper supports the overall premise of Inan's position that an agent's curiosity is directly proportional to both his interest and uncertainty about a proposition. Inan posits that an agent can be uncertain about a proposition when he can suspend his belief about it, which motivates his curiosity². Additionally, he asserts that curiosity is inversely proportional to evidence and agent's belief about a proposition. Inan might have intended to suggest that if there were equal amount of evidence supporting and rejecting a proposition that compels an agent to suspend his belief, his curiosity would be at maximum. Inan (2010) adequately covers roles of belief, acquaintance, and osensibility in curiosity, which is outside the scope of this paper³.

Second, I raise an objection to an aspect of Inan's proposition that firm certainty and high interest yields no

curiosity. As noted earlier, Inan's claim is clearly defensible in enquiries involving for example cases of propositional curiosity (e.g., whether color of microbe P is purple in ultra-deep ocean?). Consistent with Inan's claim, such curiosity is extinguished when the scientist becomes certain (e.g., by discovering that the color of microbe P is in fact purple in ultra-deep oceans).

However, there can be objectual curiosity cases (e.g., what is micro P's life in ultra-deep oceans like?) where Inan's claim may be deficient. Moreover, there can be enquiries as in the academic field where a scientist has a mind-set that sustains his curiosity about propositions, even though he might have known it with certainty at some point in the past. A mind as such can be open to the idea of unthinkable possibilities, overshadowing the idea of a thinkable impossibility (i.e., it is impossible for a proposition that is now thought to be certain to be not so for ever). Such a scientist could keep a mind-set that is open to the idea of the unimaginable (e.g., about life of microbe P in ultra-deep oceans). He could be curious for its own sake and live a curious life as a matter of principle that transcends certainty, in part, because he feels joy in the process of being curious instead of its outcome (thereby transcending sought-for certainty about particular propositions).

Third, I show how a number of rebuttals to my objection where factors other than curiosity may fuel a firmly certain agent's enquiry, which fall short of curing Inan's claim, including:

- (i) an agent may pursue his enquiry despite being firmly certain due to feelings such as fear or anxiety of losing face and not due to curiosity,
- (ii) interest OR uncertainty yielding curiosity instead of interest AND uncertainty, or
- (iii) an agent can know the object of his curious enquiry with certainty but remain subjectively uncertain about it, which motivates his continued curiosity.

Fourth, I suggest an alternative view that is congruent with the overall spirit of Inan's claims about curiosity, by adding *open-mindedness* to his curiosity equation, which can help exculpate my objection to his claim. Considering my supplemental formulation, one can remain curious about the object of enquiry which is of interest to him, despite having or having had firm certainty about it at some time, when he is open-minded. Despite firm conviction, an open-minded person takes a curious initiative willingly, and gives serious consideration to the other side. Open-mindedness is a (Baehr, 2012) "facilitating virtue" and an activity that is a cognitive "moving beyond" or transcending of the person's doxastic commitments, and thus facilitating deeper curiosity. Open-mindedness keeps the agent's interest and uncertainty alive, and frees his mind beyond the particulars of belief - keeping it

unimpeded from binds of certainty - by allowing the mind to remain detached from a default positions or standpoints.

II. DISCUSSIONS

A. *Supporting Inan's Claim that the higher the Uncertainty and Interest, the higher the Curiosity*

Certainty Factor: Inan claims that curiosity about whether a proposition is true or false can only take place under uncertainty. He suggests that the degree of uncertainty is directly proportional to the degree of curiosity. Thus, if one's belief is highly certain about the object of an enquiry, then curiosity is minimized. Moreover, Inan points out that minimal evidence maximizes uncertainty, which yields greater curiosity about the object of an enquiry. For instance, if you have a lottery ticket and you are certain that you will not win (e.g., one in a trillion chance of winning), you will likely not be curious, according to Inan. But, if you have a lottery ticket with even a 0.01% chance of winning (99.99% chance of losing), you would be very curious⁴.

Inan claims that curiosity is inversely proportional to belief, since belief is directly proportional to certainty⁵. For Inan, being certain about a proposition corresponds to maximum strength of belief in that proposition. He claims that strong subjective certainty prohibits curiosity, but implies that anything short of subjective certainty allows room for curiosity. With curiosity being tied to evidence, Inan claims that S's curiosity is at its highest, when there is no evidence that P or about P. Moreover, Inan states that generally minimal evidence and soft belief yields soft subjective uncertainty, and hence stronger curiosity. Most likely, Inan intends to posit that curiosity is maximal when (all else equal) there is an equal amount of evidence supporting P and contradicting P⁶ (Fairweather, 2012).

Inan, thus far claims that if S is firmly certain that P or about P, then S will not be curious that P or about P. The mirror image of his claim is that if S is highly uncertain that P or about P, then S will be highly curious that P or about P.

Interest Factor: Inan holds that if an agent is uninterested about an object of enquiry, then he will not be curious about it. Accordingly, the degree of interest in the object of curiosity is directly proportional to his degree of curiosity^{7,8}. Inan contends that if an agent knows that it is highly improbable for a belief he holds (e.g. formed based on evidence or lack thereof) to be false, he may still be curious about it, depending on his interest. Inan claims that an agent's curiosity is maximized, even when there is minimal evidence, only when the agent has an interest in the object of the enquiry^{9,10}.

According to Inan, evidence impacts both belief and interest (and interest and belief are not independent attitudes),

which in turn motivate curiosity^{11,12}. All else equal, an agent is interested in or about an object of enquiry, manifested in part, via his degree of belief about it. In Inan's view, just like the relationship between belief and curiosity, interest also comes in degrees: the higher the interest, the more the curiosity.

Uncertainty and Interest Yielding Curiosity: According to Inan, lack of certainty AND being interested in an object of enquiry motivates curiosity. In other words, if S is interested in that P or about P, and uncertain that P or about P (S suspending belief that P or about P), then S can be curious that P or about P. Hence, Inan's claims that if S is firmly certain that P or about P, and even if S is highly interested that P or about P, then S will be not be curious that P or about P¹³.

B. Objecting to an Aspect of Inan's Claim that firm Certainty AND (even highest) Interest yields no Curiosity.

For more details regarding objectual (e.g. what is life in the ultra-deep ocean like?) and proportional (e.g. whether there is life in the ultra-deep ocean?) curiosity, readers can refer to Whitcomb's (2010) paper.

Inan's claim is valid for enquiries involving, for example, a propositional curiosity ceasing when uncertainty about such proposition is eliminated. For example, once the answer to an enquiry such as "whether microbe P is purple in ultra-deep ocean" is discovered (i.e., that in fact microbe P is purple in ultra-deep ocean), then such curiosity is exhausted because uncertainty about it is extinguished.

However, Inan claiming *firm certainty and even maximal interest yielding no curiosity* may be objectionable because it does not seem sufficient for either objectual curiosities or common (qualitative) scientific or academic enquiries.

For example, it is not uncommon for a scientist to self-initiate a reevaluation and reconsider his past certainty about some propositions. A Marine Biologist may be firmly certain *about* life in the ultra deep ocean (based on the evidence collected by Kaiko probe from the ultra-deep ocean). But also, he could still remain curious about life in ultra-deep ocean by being open to the re-examination of the same evidence, and follow reports or evidence offered by his peers (i.e. papers which might endorse or reject his conclusions or interpretations of Kaiko's evidence). Despite his certainty, the Marine Biologist could remain curious about life in ultra-deep ocean for even the slightest possibility of finding or learning something new (albeit highly improbable). He has this attitude towards curiosity, which transcends his idea about certainty, in part, because his field may be his passion, or perhaps because his investigative curiosity about life in ultra-deep ocean is a way of life for him. In such a light, it is not uncommon that a scientist's curiosity and interest remains alive despite his firm certainty about all thinkable aspects of

an enquiry at the time, which he had already contemplated and investigated.

Due to their qualitative nature, there is a greater tendency in objectual curiosity enquiries to facilitate more room for curiosity to persist. Framing enquires objectually, combined with an agent's *attitude* towards curiosity could over shadow the idea of certainty and keep his curiosity alive. Endurance of curiosity is not always necessarily about having firm certainty about one imagined aspect (i.e., part A) of an enquiry and being uncertain and hence curious about another imagined aspect (i.e., part B). A scientist who is deeply interested about the object of his science, with an open mind, may maintain his curious attitude, despite having once attained firm certainty about all the thinkable aspects (i.e. part A and B) of the object of his enquiry. This kind of open minded attitude may keep more space for more questions and more unimagined possibilities beyond what had been once imagined, asked, and answered.

Being open to the possibility of the unimaginable may not necessarily be due to uncertainty about the object of curiosity. Such openness may stem from a scientist's personal trait which moves him above and beyond the particulars of objects of his curiosity, especially when risks-rewards or costs-benefits are not unfavorable in keeping the enquiry alive despite his certainty about it at the time. For example, in the case of the Marine Biologist, he may take pleasure and may see little harm or trouble in (spending extra epistemic capital) attending an extra conference or reading an additional article about Kaiko's findings.

When the agent opens his mind, he may see that the idea of *certainty* about a proposition inculcated at the time may prove to be less important than *other possibilities* about the proposition that may await his re-discovery in the future, and this can sustain fueling his curiosity.

Therefore, to rectify Inan's claim, open-mindedness could augment his formulation together with firm certainty, and even the highest interest to yield curiosity, which is discussed in the fourth section of this paper.

C. Rebuttals to Additional Objections:

i. Not Curiosity, but Other Feelings such as Anxiety and Fear Fueling Agent's Enquiry: Inan could counter-argue that a scientist who is firmly certain about a proposition may continue pursuing his enquiry about a proposition due to anxiety or fear of losing face, and not for curiosity's sake. Let's consider the case that the Marine Biologist, with firm certainty about all thinkable aspects of life in the ultra-deep ocean, who has published or lectured the scientific community about his findings. Inan could assert that the reason, such firmly certain scientist would continue his enquiries about life in the ultra-deep ocean, may be because he wants to maintain his reputation and defeat his contrarian

competitors, or he may be anxious about the slightest probability of being wrong and losing face, or that the security of his job requires him to defend his published work about life in ultra-deep oceans. Thus, Inan might respond that the scientist, who is firmly certain, may be motivated to continue pursuing his enquiries for other feelings such as anxiety, fear, saving face, or desiring security, and not due to his curiosity.

However, even an agent such as a scientist who is very uncertain about an object of his curiosity may have similar feelings (anxiety, fear, desiring security) that are operational before or during his enquiry, not only when he is firmly certain after his enquiry has been concluded.

Additionally, there is no evidence to suggest that curiosity is independent of feelings such as anxiety or fear, but instead there are correlative studies that suggest that feelings such as fear may be interrelated with curiosity. (Lowenstein, 1994). Necessity, triggering man's anxiety, fear, and desire for safety and security may have been the mother of many inventions in the survival phase of man's evolution. Such feelings have worked hand-in-hand with curiosity and have as such become intertwined with curiosity. Such feelings and curiosity have motivated man to pursue knowledge about new ammunitions, solutions, and tools, which in turn has helped him to build a world that has been becoming more cooperative. In a cooperative world where man is less afraid, less worried, and less anxious about his survival or safety, curiosity would likely carry the greater force (despite being meshed with other fainter feelings such as worry, fear, and anxiety) in epistemic enquires that are of interest to him.

ii. Uncertainty OR Interest (Instead of Uncertainty AND Interest) Yielding Curiosity: Inan could modify his claim and respond that an agent would be curious if he is uncertain about the object of his inquiry OR the object of inquiry is of high interest to him. Thus, the Marin Biologist who is firmly certain, maintains his curiosity (not via uncertainty) but due to his high interest about life in ultra-deep oceans.

However, the problem with the OR arrangement arises in cases where object of inquiry is trivial: for example whether the total number of words in a book are odd or even. Here, the object of inquiry is not of interest, where the agent can be (highly) uncertain whether the number of pages is odd or even, but he would not be curious whether the total number of words in a book are odd or even.

iii. Not Curiosity, but (Knowing and yet) being Subjectively Uncertain Motivating a (firmly Certain) Agent to continue his Curious Enquiry: Inan states that certainty corresponds to the maximum strength of a belief. Once that maximum strength of belief is reached, curiosity becomes impossible¹⁴. As indicated previously, Inan claims that curiosity is inversely propositional to the strength of one's

belief and that subjective certainty is incompatible with curiosity¹⁵. In this light, Inan had implied that (Fairweather, 2012) if S know that P or about P, but S's belief is short of being subjectively certain that P or about P, then S might still be curious whether P or about P. Thus, Inan could respond that although the Marine Biologist may know about many or all aspects of life in the ultra-deep ocean based on the evidence collected by the Kaiko probe, still the Marin Biologist can remain curious because his subjective certainty (belief) about different aspects of life in ultra-deep ocean can fall short of firm certainty.

However, relying on subjectivity takes the philosophical (epistemic) enquiry in a more psychological path. It opens the door to the idea that justification does not or may not require certainty with the extreme case being dogmatic certainty. Subjective uncertainty or certainty, including dogma, may stand incompatible with knowing, which is a topic beyond the scope of this paper. Therefore, if subjective uncertainty were a form of open mindedness, then such aspect of subjective uncertainty may work here. Having said that, open mindedness may be a more suitable trait for epistemology compared to subjective uncertainty, which is an unidentifiable subjective motive that could unconsciously or at best sub-consciously compels a curious agent to doubt or second-guess himself and help enliven his curiosity.

III. CONCLUSION

The Higher the Interest, Uncertainty, and Open-Mindedness, the Greater the Curiosity, Instead of Inan's View that the Higher the Interest and Uncertainty, (only then) the Greater the Curiosity

The consequence of Inan claim is that one's curiosity ceases when he has become certain about his object of interest. I object to Inan's claim because, while his proposition may cover ordinary enquiries such as propositional curiosity, that is not broad enough. My objection utilized examples in cases of objectual curiosity and scientific enquiries where it is possible for an agent to remain curious about an object he is interested in, because his approach towards curiosity may be more qualitative or he may have a curious attitude beyond the point of being defined or extinguished with certainty. My alternative view restores Inan's curiosity claim, and it is not a radical departure from his core perspective regarding the role of uncertainty and interest, but instead it entails a modification to his formulation by including open-mindedness to his curiosity equation.

Hence, all things being equal, I suggest that one can be certain about his object of interest, and still remain curious about it when one is open-minded.

For example, let's contemplate on a case of a Detective Holmes who could remain curious about other evidence that may present itself about Smith's murderer, despite Holmes

having concluded that Ralf murdered Smith. Holmes could remain curious because he is open-minded, which could stem from his attitude about truth overriding the operations of his certainty. Holmes, being open minded, could likely contribute to more good than harm in expending additional detective capital such as taking an extra phone call, conducting an extra interview, or contemplating any additional (previously unimagined) possibilities contrary to his original findings. Additionally, open-mindedness may be an implicit norm of his profession. Detectives may have a duty to be practical about closure and concluding a murder case by relying on evidence against Ralf that is beyond a shadow of doubt. Yet, their employer may grant them the discretion to leave the door open for the remote possibility of any new or contradictory evidence and suspects – albeit improbable. Note that even before Holmes becomes certain about Ralf, his open-mindedness can facilitate his curiosity by enabling Holmes to suspend his judgment and certainty by considering (have interest in) all evidence for or against any suspect, including Ralf. Thus, open-mindedness facilitates, and neither hinders the operation of uncertainty nor works to diminish Holmes interest in the course of his curious enquiry.

As noted in an earlier example, a Marine Biologist remains curious about life in ultra-deep ocean, despite being certain about all that was once the thinkable aspects of life in ultra-deep oceans because he is open-minded. A Marine Biologist remains curious because his curious attitude about pursuing truth could keep his imagination open to unimagined possibilities, which dominates and overrides his certainty about a particular life in ultra-deep oceans. Similar to the detective case, open-mindedness for the Marine Biologist keeps him interested, with his curiosity persisting.

To make the role of open-mindedness in curious inquiries more clear, some background and framing of this trait may be helpful. The quality of open-mindedness that makes it an intellectual virtue is widely covered in the current literature¹⁶. Some distinctive features of open-mindedness are generally relevant to situations involving intellectual conflict such as a person's belief on one hand and opposing argument and body of evidence on the other (Roberts, 2007). Nonetheless, open-mindedness can be manifested in situations void of intellectual dispute and can be present in intellectual activities other than rational evaluations (Baehr, 2011, p196).

Open-mindedness is closely related to virtues such as intellectual fairness, honesty, impartiality, empathy, patience, adaptability, creativity, and autonomy¹⁷. A curious agent understands the risk and disadvantages of being closed-minded, which could fuel his inclinations towards open-mindedness. An agent may have learned that being closed-minded would generally prevent a person to “conceive of or imagine certain otherwise inscrutable or unidentifiable possibilities or explanations in his enquiries” (p198)¹⁸. In this light, a truth-seeking agent who is generally biased against

closed-mindedness remains willing to expend some extra amount of epistemic and cognitive capital, despite the certainty about the object of his curiosity. An open-minded person does not ignore or distort new or opposing positions. “In the context of intellectual conflict or opposition, open-mindedness is an antidote to vices such as narrow mindedness, closed-mindedness, dogmatism, prejudice, and bias”(p195). While he may have many firm convictions, “his hold on them does not prevent him from giving serious consideration to the other side” (Roberts, 2007). In order for an agent to remain curious, “taking seriously an alternative cognitive standpoint” requires first the freedom or departure from chains of his own beliefs and cognitive conclusions. In each case that a person departs or detaches from a certain default or privileged cognitive standpoint, he or she moves beyond or transcends it (Baehr, 2011, p198).

An open-minded person is one who is able to, even if need be temporarily, loosen his grip on his belief or certainty that P in order to consider or take seriously the case for not-P, not due to some subjective or unconscious uncertainty about P, but due in part to desire for truth that transcends particular truths. Intuitively, it is this cognitive ‘moving beyond’ or transcending of the person's doxastic commitments, and a willingness to consider things from the other side, that makes the activity in question an instance of open-mindedness (pp. 198-199).

Open-mindedness is often a “facilitating virtue” that equips the curious agent to think outside the box not just about this P, but about all the P's that he has not yet imagined or met. It allows the curious dialog to keep going. By freeing the mind beyond the particulars of belief, or keeping it free from the binds of certainty, it creates psychological space, as it were, for other virtues and faculties to perform their respective functions. Also, note that the kinds of open-mindedness, in the context of curiosity, is about things that are genuine objects of interest or entail having something at stake that demands taking such a standpoint “seriously”: the real intention of being open-minded is “not just for show” but it requires giving that object of interest a fair, honest, and objective hearing (pp. 205-207).

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Professor David Landy, and Professor Abrol Fairweather at San Francisco State University for their mentorship and invaluable feedbacks.

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AUTHPR'S PROFILE



Ali Far received the B.S. in Electrical Engineering and Computer Science from University of California Berkeley in 1983. He got his M.S. in Electrical Engineering in 1986, M.B.A. in 1989, Juris Doctor in Law in 1997, and M.A. in Psychology (MFT & LPCC) in 2010, all from Santa Clara University. He is currently completing his M.A. in Philosophy at San Francisco State University.

Between 1982 to 1997, Ali worked in Silicon Valley for technology companies including Plantronics, Precision Monolithic (now ADI), Micro Power Systems (now Exar), Media Vision (now Creative Labs), and lastly for TelCom Semiconductor (now Microchip) where he was Vice President of Design Engineering. During this period, Ali developed analog semiconductor chips for wireless, personal computers, consumer, industrial, defense, and medical applications for the US and Asian markets.

Subsequently, Ali switched fields to technology investment banking, and between 1998 to 2009 he worked at Wall Street firms including Prudential Securitas, Galleon Group, and lastly Spherix where he was Founder, Portfolio Manager, and Technology Analyst covering and investing in semiconductor, storage, wire-line, wireless, and internet technology equities for North America and China regions.

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Ali has 12 patents and several pending in the area of analog semiconductors.

His current areas of interest in philosophy are Asian and continental philosophy, and philosophical psychology.

END NOTES

¹ Socrates: The only thing he knew was that he knew nothing. This awareness of ignorance is much more than just acknowledging that there are some things you do not know. The Socratic Teacher knows that his ignorance touches every thought he has and every fact he knows.

² A brief summary of *propositional versus objectual curiosity* is provided here by way of an example offered by Fairweather (2012). Being curious whether Ralf is Smith's murderer is *propositional curiosity*, and it is generally a direct question (we can also say we desire to know or get a true belief about the truth of Ralf murder of Smith). But if we are curious about who murdered Smith, there is no propositional object of curiosity, and it is generally an indirect question (involving an *objectual curiosity*). Inan and Whitcomb both agree that *objectual curiosity* requires acquaintance. Also they agree that the degree of belief may not be as relevant to *objectual curiosity* since there is no propositional attitude. Inan refers to a distinction between beliefs where some beliefs are *de dicto* (concerning the dictum, the thing said or the proposition) and others are *de re* (concerning the thing). Object of *de dicto* belief are (generally direct and) propositional, versus the object of *de re* belief is a person or a thing, and not a proposition, and (are generally indirect) objectual. Inan borrows this same concept from belief systems, applies it to curiosity, and refers to Whitcomb (2010) who argues that generally curiosity cannot be (*de re and de dicto*) propositional attitude. Whitcomb argues that propositions are generally not the content of curiosity, but rather questions are (and Inan neither explicitly disagrees nor agrees with Whitcomb on this matter).

³ This is similar to Sellar's concept of "ostensible seeing" that brings agent's conceptual (experiential) representations that are concepts formed in the agent's imagination about for example the value and success of the object of curious enquiry. Moreover, acquaintance and interest are not mutually exclusive in relation to an object of curiosity, go hand-in-hand, and are directly proportional with each other.

⁴ The example of lottery ticket may not do justice for curiosity since other feelings such as greed, addiction to gambling, desperation (looking for a miracle) could be the dominant (emotional) motivators as opposed to curiosity.

⁵ Inan implies that certainty can be viewed in the "subjective" sense. He notes that people who hold dogmatically false beliefs are paradigm cases. Also, Inan seem agreeable that one can even be curious about something he or she knows, as long as that piece of knowledge is fallible and thus not certain (in the subjective sense). Although an utterance such as "I know that the world population is greater than 7 billion, but I am not certain that this is the case and I am still curious whether it is so" does seem somewhat odd, it may very well express a truth. Given that this would appear to be a controversial issue, Inan does not pursue it here since his focus starts and ends in how curiosity relates to belief. (Fairweather, 2012).

⁶ For example, Holmes (investigating a murder) suspects S1 and S2 to be possible murderers (although Holmes knows that such belief about S1 and S2 are highly improbable because there is no evidence) and he remains curious who the murderer is (say Holmes curiosity degree is at 0.5). Subsequently, Holmes finds evidence that Ralf might be the murderer (say curiosity degree goes higher than 0.5). All else are not equal before and after the evidence pointing to Ralf. When there was no evidence against Ralf, Holmes was curious who the murderer was, but not curious whether Ralf was the one or not.

⁷ Curiosity needs to have something at stake (of utility or value or importance) that makes the object of curiosity of interest to the agent. Generally speaking, curiosity does not chases truths that are (easy because we perceive easy as) unimportant or of no value. Society rewards finders, creators, and makers – who produce, which is a potential aftermath of curiosity. Therefore, normative aspect of what is importance and which is of

value play into curiosity in assessing what is worth pursuing and what is not. The normative aspect of curiosity is an important subject but beyond the scope of this paper.

⁸ Example of uninteresting truths are trivial propositions such as the number of words in a book being odd or even, which don't make a difference to a curious agent.

⁹ What locks-in our curiosity starts with our detection of a gap (uncertainty) between what we know/believe and imagine/sense and this gap needs to be wide enough to make us imagine that there could be something of value worth pursuing. Research by Forkman (1996) suggests that we seem to be somewhat coded to look for what is not obvious because we assign a higher priority to it (because it triggers our curiosity) compared to what is obvious.

¹⁰ We imagine easy truths, as fruitless or as trivialities that others –situated similarly- have found or not have bothered to pursue. Thus, generally, object of curiosity needs to be non-trivial in relations with the interest and skills of the curious agent. Also, note that in Holmes example, the detective's skills and non-triviality of evidence are not necessarily mutually exclusive factors and would influence curiosity.

¹¹ Example: S buys a lottery ticket. If his odds were 1 in a million to win the lottery, he will likely be somewhat curious about the outcome. However, when S finds evidence that suggest his odds have increased to 1 in 100, then S's belief about winning and interest would amplify. Thus, S becomes more curious.

¹² Inan claims that curiosity will be inversely proportional to belief and directly proportional to the interest. Additionally, Inan suggests that there are objects that we have firm beliefs or opinions about, but have no interest in them. Interest and belief are not independent attitudes. "Interest interacts with belief in its own peculiar way, and without further inquiry into this interaction we may not jump to any conclusion" (Inan, 2012)

¹³ In a lottery ticket example, applying Inan's claim yields that if S knows (based on facts) the his odds to win the lottery were 1 in a trillion, he will not be curious about the outcome. S's interest in lottery can remain very high given the potential rewards of millions of dollars. However, S's certainty about not winning (given the extremely low odds) causes his curiosity to cease.

¹⁴ This belief may or may not be true or normative, but it is intended here to describes the agent's mental state.

¹⁵ Case of dogmatic belief is for example when an ancient was certain that the world was flat, then he could not have been curious about whether this was or was not the case.

¹⁶ Montmarquet (1993), Kvanvig (1992), and Roberts and Wood (2007)

¹⁷ Readers can refer to Baehr's (2011) paper regarding the "structure of open-mindedness" that explains such relationships and addresses whether open-mindedness is a disposition (of the will or involving a reliable ability or capacity) to exercise intellectual excellence.

¹⁸ We pursue our curiosity through engaging in exploration because we feel good when we imagine the potential benefits and not necessarily the real benefits. Our imagination (Brand, 2009) about the possible impact and utility of our enquiry servers our focus and attention from which we drive pleasure.