

Anxiety Sensitivity and Its Importance in Psychiatric Disorders



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SUMMARY

Anxiety sensitivity refers to the extent of beliefs that anxiety symptoms or arousal can have harmful consequences. There is growing evidence for anxiety sensitivity as a risk factor for anxiety disorders. Anxiety sensitivity is elevated in panic disorder as well as other anxiety disorders. It is thought to contribute to the maintenance and severity of anxiety symptoms. Studies have shown that anxiety sensitivity more specifically predicts the future occurrence of panic attacks. The Anxiety Sensitivity Index (ASI), which measures the construct of anxiety sensitivity, has three subscales, namely, the ASI-Physical subscale, ASI-Social subscale and ASI-Mental Incapacitation Concerns subscale. The dimension reflecting “*fear of physical sensations*” of anxiety sensitivity is the most predictive one of panic attacks and panic disorder. Research on the ASI has demonstrated that persons diagnosed with post-traumatic stress disorder, generalized anxiety disorder, obsessive-compulsive disorder, and social anxiety disorder all had ASI scores higher than normal controls. Depression was speculated to hold a positive correlation to high anxiety sensitivity scores. The relationships between anxiety sensitivity, alcohol and substance use disorders are still unknown. There is evidence that anxiety sensitivity is related with “drinking used as a way of coping”. Since anxiety sensitivity is a cognitive construct, it should be taken into consideration when evaluating patients with anxiety and psychotherapeutic formulations.

Key Words: Anxiety sensitivity, trait anxiety, psychiatric disorders.

INTRODUCTION

The cognitive models of anxiety disorders have been developed in the last two decades. Specific cognitive mechanisms are suggested to play a role in the etiology of anxiety disorders and/or their persistence. One of these disorders, Anxiety Sensitivity (AS) was, for the first time, defined by Reiss and McNally in 1985. In our article, the definition of AS, its relation with other anxiety concepts, sex differences, evaluation and the importance of AS in psychiatric disorders will be discussed. All of the publications between 1985-2010, which include the key words, “anxiety sensitivity” and “anxiety sensitivity index” in the database of PubMed have been scanned. Additionally, the reference sections of the accessed articles have also been researched. The articles dealing with the definition of AS, its scaling, and relationship with psychiatric disorders have been evaluated.

The Definition of Anxiety Sensitivity

AS accounts for the main baseline of the “fear expectation model”. According to this model, the processes of “AS” and “anxiety expectation” play a role at the root of the motivation for avoiding an incident or situation that causes fear in humans. AS is characterized as *the fear that the sensations and symptoms relative to anxiety have harmful physical and/or social consequences*. The expectation of anxiety, on the other hand, is *the expectation that one will experience an anxiety or fear in “a particular situation”*.

The concept of AS partly overlaps with the *anxiety of expectation* in panic disorder (PD) in a clinical sense. Yet, the anxiety of expectation, different from AS, is acquired in the wake of panic attacks and is the concern about the inevitable recurrence of a panic attack. AS, on the other hand, is a basic fear that is permanently existent in one’s nature. When experienc-

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ing an anxiety, those with a high AS level are instantly alarmed due to their fear, which exacerbates their anxiety (Reiss and McNally 1985). To the writers, AS is an individual labile and cognitive structure defined as “fear from fear” or “fear from anxiety”. In other words, this definition is developed by integrating the expectation model with the misinterpretation through aggravation in PD (Starcevic and Berle 2006).

One of the problems with the concept of AS is whether there is any concept different from trait anxiety. In this sense, it is claimed that AS is “the *subdimension of trait anxiety*” and that the high-level anxiety determined in various diseases may be caused by the effect of trait anxiety (Lilienfeld et al. 1993). It was also suggested that trait anxiety is a subfactor of neuroticism, that AS, on the other hand, is a subfactor of trait anxiety and that there is a hierarchical relationship between these three structures (Lilienfeld et al. 1996). Furthermore, evidence was found to suggest that AS is a subcomponent of neuroticism (Zinbarg and Barlow 1996). *Trait Anxiety* is described as “a tendency to react in fear to the stimulants that cause stress” or “a structural liability to experiencing common anxiety symptoms”. There is “a general state of worry” about the future stemming from one’s past anxiety experiences whereas anxiety symptoms are not feared from. On the other hand, AS is “the tendency to respond with fear to the anxiety symptoms” themselves which are due to the person’s beliefs about them (Taylor et al. 1996). From the studies made through the tests developed to evaluate both of the concepts, it followed that their factorial structures differed from each other, whereas there was an average level of correlation between them (Taylor and Cox 1998, Sandin et al. 2001). It was stated that people may have a low AS while having a high trait anxiety or vice versa. (Cox et al. 1991a). The view that AS is different from trait anxiety is more consistent and is complementary with our personal observations.

The Evaluation of Anxiety Sensitivity

The most frequently used scale in the evaluation of AS is the *Anxiety Sensitivity Index* developed by Reiss and his colleagues in 1986. The Index consists of three subscales (physical, cognitive and social) and sixteen items in total. *The physical subscale* measures “fear from somatic symptoms” resulting from anxiety, such as the fear from feeling tachycardia or dyspnea. *The cognitive subscale* measures the extent of “fear from losing cognitive control” which evaluates situations like fearing from the disability of focusing on a particular subject or from one’s having weird feelings or feelings of loneliness. *The social subscale*, on the other hand, evaluates the situations defined as “fear from one’s anxiety symptoms being spotted by people around” (e.g. shaking noticed by those around). There has been validation and reliability studies on its Turkish version form (Ayvaşık 2000). In the studies made for children, the *Childhood Anxiety Sensitivity Index* is used. Later on, the

scales of *Anxiety Sensitivity Index-Revised Form* and *Anxiety Sensitivity Profile* have been developed aiming at evaluating AS. Finally, the *Anxiety Sensitivity Index-3* has been developed. A validation and reliability study of *Anxiety Sensitivity Index-3* (Taylor et al. 2007) consisting of three subscales (physical, cognitive and social) and eighteen items has also been made in our country (Mantar et al. 2010)

Experiences of Learning and the Role of Genetic Factors

Classical, acquired or observational conditionings are responsible for the occurrence of anxiety symptoms in people (Türkçapar 2008), and AS development may occur through any of these three primary mechanisms. Their fear from the anxiety symptoms that their role models suffer from, their way of articulating these problems, and the beliefs transferred to the child concerning the damage of the symptoms may lead to high AS development. In fact, AS is defined as a structure which is thoroughly learned and/or is influenced by genetic factors (Reiss and McNally 1985).

It has been noted that parental attitudes faced during childhood causing anxiety and depression may lead to the growth of AS. Scher and Stein (2003) came to the conclusion that “threatening parental attitudes” specifically predicted the socially observable anxiety symptoms and that “hostile and refusing behaviours” specifically predicted the fear growing out of cognitive loss of control. In addition to this, children being exposed to “the uncontrollable actions” of their parents due to alcohol or substance intake or fury was also associated with high AS levels (Watt et al. 1998).

In a study of twins, AS was suggested to occur 45% of the time due to genetic factors, whereas the rest was said to be determined by environmental factors (Stein et al. 1999). Considering the close relationship between AS and PD, AS was expected to be higher in PD patients and their first-degree relatives as compared to healthy controls. As a matter of fact, AS levels in the first-degree relatives of the patients with PD were determined to be higher than controls and lower than PD patients (Van Beek and Griez 2003). Yet, there are also data contrary to these findings. No differences were stated in terms of AS in the children of parents with and without PD and no relation could be found between the parents with PD and their children in respect of AS levels (Van Beek et al. 2005, Manuzza et al. 2002). In another study of twins regarding the effect of genetic and environmental factors on AS, heredity in women was determined to be more effective in those with a high level of AS compared to those with a low level of AS. The importance of both genetic and environmental factors is highlighted for each of the three sub-traits of AS in women. It was observed that the effect of environmental factors on men was more effective, while the effect of heredity on them was of no importance (Taylor et al. 2008). Even only with these data, it is clear that AS is a structure originating

from psycho-biological factors. Extensive studies to be made in the future on the interaction of gene-environment in terms of the development of AS will elucidate this subject.

Anxiety Sensitivity and Gender

Considering the incidence of anxiety disorders rather in women, it seems reasonable that there should be a relationship between AS and gender. Inconsistent results capture attention in the studies that inquire about this relationship. In some of the research done on university students, it was discovered that women have higher AS scores compared to men (Reiss et al. 1986, Stewart et al. 1997a). However, there are also publications where no relationship was determined between AS Index Scores and gender (Ayvaşık 2000, Cox et al. 1991a). In one of the studies, although there is no sensible difference between sexes, it was stated that women with higher AS Index scores have more liability to develop panic attack than men (Cox et al. 1991a). The differences between sexes have been investigated in terms of AS sub-dimensions as well. It was discovered that women had higher physical and total AS scores in comparison to men, while men had higher social and cognitive traits compared to physical ones (Stewart et al. 1997b, Foot and Koszycki 2004). In a meta-analysis where a total of 38 publications were evaluated, a major difference in terms of AS levels was identified between women with any kind of anxiety disorders and healthy ones (Olatunji and Wolitzky-Taylor 2009). In view of the information being conveyed, we can say that the relationship between AS and gender has still not been clarified.

Anxiety Sensitivity and Psychiatric Disorders

Panic Disorder

Before the expectancy theory, the view that AS was a consequence of panic attacks was predominant. Along with this theory, beyond AS being a consequence, the view that it could be important, and moreover, be a specific risk factor in the development of panic attack and anxiety disorder became predominant. Both in prospective and retrospective studies, it has been suggested that high AS predicts the development of PD and other anxiety disorders (Cox et al. 1991b, Taylor et al. 1992, Schmidt et al. 1997a, Schmidt et al. 2008). In a recent study, it was denoted that physical subtrait in particular had a significant contribution to predicting the panic attacks of AS (Benitez et al. 2009). During a 3-year follow-up study, it was discovered that the percentage of developing an anxiety disorder in those with high AS is five times more than those with low AS (Maller and Reiss 1992). In a prospective study where a group of young adults were examined during a 5-week basic military training, it was suggested that in the course of that stressful period, *those with a high AS* were at greater risk in experiencing a panic attack than the ones with a low AS. Furthermore, even when the ones with trait anxiety

and PD story were excluded, AS was determined to predict unexpected panic attacks (Schmidt et al. 1997a). As was assumed, along with all of these studies, it was verified that AS is closely associated with PD development.

AS is not only related to the panic attacks of PD patients but also to the existence of agoraphobia (White et al. 2006). Indeed, the AS level in agoraphobic individuals was higher and AS predicted the number of agoraphobic cases of patients (McNally and Lorenz 1987). Hayward and Wilson (2007) even put forward that due to the close relationship between AS and avoidance behaviour, AS was responsible for agoraphobia developing without experiencing any panic attacks.

The relationship between AS and PD has also been investigated as part of challenge studies. Compared to the individuals with a low AS, those with a high AS were determined to have experienced the panic attacks more intensely in the wake of voluntary hyperventilation or the constrains made through breathing into brown-paper bags (Asmundson et al. 1994, Eke and McNally 1996). The fear response manifested during the hyperventilation and 5.5% CO₂ challenge studies applied on PD patients was stated to have been associated only with the AS physical trait, whereas the cognitive trait was said to indicate a stronger association with depressive emotions (Zinbarg et al. 2001, Brown et al. 2003). It was stressed that high AS Index scores could predict the occurrence of the symptoms of panic attacks, regardless of the diagnosis in the challenge studies, primarily the CO₂ study (McNally 2002). However, there are also some research data which do not corroborate such generalizations. During the biological challenge studies that probed the effect of AS, it was specified that those with a high “state anxiety” tended to undergo more anxiety and that this could be defined with the concept of trait anxiety (Lilienfeld et al. 1993). The AS Index was suggested to have failed to distinguish the patients who did and did not have panic attacks through CO₂ challenge (Kozsicky and Bradwejn 2001, Struzik et al. 2004, Monkul et al. 2010). We are of the opinion that during challenge studies, as well as AS, other factors, such as the existence of trait anxiety and its intensity, whether it has a family story and whether there are respiratory-related panic attacks should be evaluated. Therefore, it cannot be stated that AS is the only main factor responsible for the occurrence of panic attacks during challenge studies.

During the studies made with different groups of patients, it was determined that patients with PD usually had a higher AS than the healthy ones and those with other anxiety disorders and that PD patients had scores over two standard deviations of the AS Index norms. The individuals with a high AS underwent more physical symptoms in the course of the panic attack (Taylor et al. 1992). In the meta-analysis of Olatunji and Wolitzky-Taylor (2009), PD and post-traumatic stress disorder (PTSD) was suggested to have shown a stronger relationship with AS in comparison with other anxiety disorders, whereas

it was stated that there was no difference between other anxiety disorders in terms of AS. It was agreed that total AS scores are of importance in predicting PD. Yet, the situation is a bit more complicated in respect of subscales. When compared with other anxiety disorders, it was stated that the physical subscale was more distinct for PD (Zinbarg et al. 1997, Benítez et al. 2009), or contrarily, that the cognitive subtrait of AS, in a one-year follow-up, was the most significant determinant for the onset of PD (Li and Zinbarg 2007). In a one-year follow-up study where AS was analyzed to be a predictor or not for a possible prospective PD, or depression and social anxiety disorder (SAD), it was specified whether cognitive and social traits were predictors, while physical subtrait was said to be a predictor of panic and depressive symptoms (Grant et al. 2007). Based on all of these research data, it can be stated that AS is not peculiar to PD but distinguishes PD patients from the healthy ones and partly from other anxiety patients. Whether the subtraits are associated with PD and other anxiety disorders still has not been clarified.

Obsessive Compulsive Disorder

It has been suggested that AS, which is thought to be a possible cognitive risk factor in the development of psychopathology, may play a role in the development and progression of obsessive compulsive disorder (OCD) (Freeston et al. 1996). In a study where anxiety patients were compared, an increase in the physical subscale of the AS Index was determined although the extent is not as high as it was seen in OCD and PD patients. Whereas in cognitive sub-scale, it was observed that OCD patients got the same level of scores with the PD patients and higher scores than those with SAD and a specific phobia (Zinbarg et al. 1997). No relation between AS Index scores and the intensity of disease symptoms was identified in a study where only OCD patients were examined. On the other hand, when OCD patients were evaluated in terms of their symptom subgroups, it was discovered that the total scores of AS Index were higher in the subgroups of contamination (contamination obsessions and washing compulsions) and doing harm (aggression obsessions and checking compulsions) than the other subgroups (Calamari et al. 2008). The fact that the number of studies were restricted hinders drawing absolute conclusions as to the relationship between AS and OCD.

Generalized Anxiety Disorder and Social Anxiety Disorder

Considering the total AS scores in the studies carried out, it was observed that although PD patients had higher scores, those with generalized anxiety disorder (GAD) and SAD got high scores from the cognitive and social subscales of AS. Rodriguez and his colleagues (2004) determined that the subscales of AS were the predictors of different groups of anxiety disorders and emphasized that the physical subscale indicated PD, the social subscale indicated SAD and that the cognitive subscale indicat-

ed GAD. This view coincides with the results of Zinbarg and his colleagues (1997); these writers also came to the conclusion that cognitive subscale had a strong relationship with GAD. In a sample composed of PD patients with agoraphobia, those with SAD and GAD, the cognitive trait was stated to be associated with GAD and secondary depressive disorder when it was analyzed with what disorders AS subscales were associated with (Rector et al. 2007). Some of the items below the cognitive subscale of AS Index is compatible with the definition “*anxiety*” in GAD. Therefore, “*the feeling that something uncontrollably bad is going to happen*” or “*negative meta-beliefs about anxiety*” coincided with the cognitive trait of AS (Wells 2005). These findings also showed that AS is not peculiar to PD and that it could play a role in other anxiety disorders.

Post-Traumatic Stress Disorder

In PTSD, bearing a number of characteristics with other anxiety disorders, are pre-traumatic, during-traumatic and post-traumatic risk factors are the determinant of the disease. A high level of AS is also expected to pose a risk for PTSD. The studies showed that the intensity of PTSD is correlated with AS, depression and anxiety scores (Hinton et al. 2005). In children with PTSD who were badly influenced by an earthquake, both the AS and state anxiety, persistent anxiety and depressive states were discovered to be significantly higher (Yilmaz 2006). It was concluded that in adults exposed to trauma, the physical subtrait was associated with PD and that the cognitive subtrait was a significant predictor of the symptoms related to avoidance in PTSD (Vujanovic et al. 2008). When the relationship between the sets of PTSD symptoms (re-experiencing, avoidance, the state of increased stimulation, etc.) and the subtraits of AS were examined, it was ascertained that both physical and cognitive scores, as well as the total AS Index scores, were significantly high in the group of patients suffering from PTSD compared to those without PTSD. In this group, the physical subtrait of AS was reported to be a significant predictor of the “intensity of PTSD symptom” and “re-experiencing” (Asmundson and Stapleton 2008). In addition to this, AS, along with depression, also strongly predicted the somatic compliances in the cases of PTSD (Jakupcak et al. 2006). The results of the research clearly showed that AS was associated with PTSD. On account of the fact that the psychological evaluations of the people were made after the trauma in all of the studies made in the field of PTSD, it was difficult to determine whether the levels of AS high in PTSD patients were the cause or the result. Still, if AS is high in people, it should be kept in mind that PTSD symptoms may intensify.

Depressive Disorder

It was determined that adult depressive patients had a lower AS in comparison with PD, while they almost had the same

level of AS than in other anxiety disorders (Taylor et al. 1996). It was predictable that AS Index scores of the depressive patients suffering from the anxiety disorder with comorbidity could be higher. Otto and his colleagues (1995) determined that there were increased AS Index scores in depressive patients, even when they excluded those with anxiety disorder comorbidity. Separately, the writers found that AS Index scores dropped off to the normal levels through antidepressant medication treatment. There was evidence regarding the fact that AS played a role in the relationship between pain symptoms and depression (Asmundson et al. 1999). In some publications, a relation comprising only of one component of AS (the fear of losing cognitive control) was mentioned between depression and AS. It was suggested that to fear from losing cognitive control was common in depression and that this represented a particular mode of AS (Cox et al. 2001a). Initially, AS that was associated with one's inability to meet expectations, and fearing from this situation due to "being unable to concentrate or distraction" was ever expanding, involving the fear of "derealization and depersonalization symptoms" and "losing control over emotions" (Starcevic and Berle 2006). These findings indicate the importance of evaluating AS in depressive patients with anxiety symptoms, in particular, during clinical practices. The results show that AS is significant in mental illness other than anxiety disorders, notably mood disorders.

Hypochondriasis

Increasing interest about the body is a natural consequence of AS (Schmidt et al. 1997b). It can be expected that long-lasting and incurable AS will lead to health anxiety in people in the very least. To verify this, there are data as to the fact that AS is an inseparable part of health anxiety (Abramowitz et al. 2007). It would be true to assume that there is an intellectual similarity between AS and hypochondriasis since hypochondriac individuals displaying health anxiety in the most typical way are scared of somatic symptoms and tend to interpret them by showing catastrophic reactions. Thus, in a sampling formed of healthy ones, the physical subtrait of AS in particular is reported to be associated with somatic vigilance and quest for medical assistance (Zvolensky and Forsyth 2002). Clinically, in association with hypochondriasis, Cox et al. (2001b) found that AS was closely related to "health interests" and "fear from somatic sensations and diseases" in general other than purely fear from anxiety and anxiety symptoms. There are additional publications which determined that AS was the predictor of the development of hypochondriasis (Watt and Stewart 2000). It was concluded that AS might be responsible for the relation between PD and hypochondriasis (Deacon and Abramowitz 2008) and also through these findings, hypochondriasis was suggested to actually be an anxiety disorder (Olatunji et al. 2009). In the anxiety patients having

been not very well-treated, we observed the developmental line from the symptoms of anxiety to the anxiety for health and then to hypochondriasis. Nevertheless, whether early psychotherapeutic interventions aimed at AS (which is high some individuals) hinders the development of hypochondriasis or not still remains unknown.

Alcohol and Substance Use Disorders

According to the model of Cooper et al. (1995) describing the reasons for alcohol use, the so-called reasons are classified as "socialization", "coping with problems", "having fun" and "adaptation". In the studies investigating the reasons for alcohol use and personality traits, those with a high AS were determined to use alcohol rather for the purpose of *coping with problems* (Samoluk et al. 1999). It was found that during the studies, drinking to cope with problems indicated a positive correlation with the fear from loss of cognitive control and from revealing anxiety symptoms in social environments, while drinking in order to get socialized showed a positive correlation with fear from the symptoms of respiration and from revealing anxiety symptoms in social environments. Drinking for the purpose of adaptation, on the other hand, suggested a positive correlation with all the subtraits of AS. Besides, it was determined that alcohol and cigarette consumption of university students was not directly related to AS but that AS was associated with alcohol use aimed at coping with problems (Novak et al. 2003). According to the results of one of the studies carried out in Turkey, those with high AS drank alcohol to avoid their fears or anxieties or to distance themselves from their negative experiences that may be due to the revelation of their fears within a group (Çakmak 2006).

In a study made with a group consisting of regular heroin users, the levels of AS were found to be at high rates that could be compared with that of PD (Lejuez et al. 2006). On the other hand, no specific relationship was found between AS and substance selection within a group of patients where different substances were misused (Forsyth et al. 2003). In another study, marijuana and hashish users were determined to have rather low AS Index scores compared with those who did not use such substances. This finding showed that there was the tendency of a negative relationship between AS and the use of marijuana (Stewart et al. 1997a). To date, no clear and reasonable relation has been specified between AS and smoking (Stewart et al. 1997a, Novak et al. 2003). However, during the early days of cigarette cessation (the first 7 days), the risk of restarting smoking was suggested to increase in the ones with a high AS owing to the fact that they are unable to tolerate the abstinence symptoms (Brown et al. 2001).

All these data indicate that the increase in AS does not cause a specific disposition to certain substances. Besides, high AS can be stated to play a role as one of the causal and sometimes maintaining factors in at least some of the substance addicts.

DISCUSSION AND CONCLUSION

For more than twenty years, the concept of AS has been considerably of interest in terms of psychological researches since the concept was first proposed. Anxiety itself creates additional anxiety symptoms- particularly somatic symptoms and fear. It partly coincides with negative affect, persistent anxiety and psychopathological concepts like neuroticism; the blurriness of borders between them or whether there is a hierarchical structure between them have still not been completely clarified. It is a distinct anxiety mode which stems from the past and which is distinguished from a trait anxiety defined as a permanent one focused on the future. It is different from the anxiety of expectation defined as the expectation that one will experience a fear or anxiety in a certain situation. Nonetheless, there is no sufficient information from clinical studies to distinguish AS from such concepts. It is recommended that the involved scales of evaluation should be used (AS Index, Eysnck Personality Inventory, etc.) in cases in which no definite distinctions can be made among them.

AS is a “vulnerability factor” for anxiety disorders due to the fact that it is a cognitive structure seeking to disclose the reasons for the disposition to anxiety and anxiety disorders. The current view is such that AS has the nature of “innate disposition”. In other words, it is one of the many factors building “disposition to anxiety” in people. Yet, in most of the anxiety patients, whether AS is the reason or the effect of the occurrence of the disorder can be dealt with. We can say that this quality of being the vulnerability factor is more accurate for the development of PD.

The depths of the assumption that AS develops by learn-

ing and through being affected by genetic factors has been plumbed (Stein et al. 1999, Taylor et al. 2008). However, it has not yet been definitely determined what kind of effects the individual differences have on AS in terms of age, education and gender. The reason for this is that there are no prospective studies investigating the biological, social and psychological factors on children that lead to AS.

Although this concept put forth for the purpose of disclosing the aetiopathogenesis of the anxiety disorders, particularly PD, was formerly thought to be one-dimensional, the succeeding studies of factor analysis have indicated that this structure is a multifactor one. In general, it can be deduced in view of these that the physical subscale of AS is high in PD, that the social subscale is high in SAD and that the cognitive subscale is high in GAD and depression. Whereas the leading studies make us think that AS is associated with agoraphobia and PD, we can now state that AS plays a role in the occurrence and/or progression of disorders like GAD, SAD, PTSD, hypochondriasis, and the disorders concerning alcohol and substance use. The importance of this role can be revealed at the end of the long-term sampling studies. On the other hand, the data as to how AS will be dealt with in the course of the treatment are rather rare (psycho-social and/or pharmaceutical approaches). The effect of treatment approaches on AS Index scores should be further investigated.

This clinically-important cognitive structure should certainly be dealt with particularly in patients with anxiety. Questioning AS in these patients and its place in psychotherapeutic formulations will affect the rate of treatment and recurrence in a positive way.

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