

**Asymmetries in Evaluation of Past and Future  
Events: Is the Temporal Asymmetry Effect  
modulated by Culture, Gender, Task, or Emotion?**

**Dissertation**

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*My God: The Start , The End*  
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## 1. Introduction

Time has been an important topic of philosophy, physics, and psychology, but this term is difficult to define. We have debates on the question of whether time is a personal perception or rather something to be quantized and measured. Our answers differ depending on our point of view; we can talk about a psychological time, a physical time or an imaginary time, etc.

Since Albert Einstein's theory of relativity (1931) there has been a great deal of controversy among philosophers, psychologists, and physical scientists about the significance of this relative phenomenon. By the middle of the last century, Kurt Lewin\* would focus on the importance of the individual's view on psychological conditions. Lewin defined time perspective as „the totality of the individual's views of his psychological future and psychological past existing at a given time“ (Lewin, 1951, p. 75). Most of the world's languages grammatically distinguish between events that take place in the future from events in the past and present (Michaelis, 2006). This linguistic attribute allows individuals to understand that the human time system is one-way and irreversible. We perceive temporal events in a sequence that can be classified into a before (past), a now (present) and a possibly later (future).

Time is tied to events that we experience. Perception is the experience at this moment; in the present. We remember how an event may have been good, and we want to restore this feeling again in the future, but we only experience it in the present. We are building Tomorrow of the stones of yesterday.

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\* Kurt Tsadek Lewin (1890 - 1947) was a German American psychologist, known as one of the founders of modern social psychology

Memories of the past help people to acquire knowledge about future possibilities. We all live in the present, but we continuously think about the future. In general people imagine various futures; they plan to attain their preferred aims while avoiding bad consequences in the future.

There has been a wide range of studies conducted on the psychological experience of time, which examine the relative value of future and past events and the influence of this temporal location of an event on the way people think. In general, this research can be divided into two groups:

- The first tended to focus on single dimension the past or future. It is worth mentioning that the studies that focused on the future dimension are more common than studies of the past dimension (for example, see Kassam, Gilbert, Boston, & Wilson, 2008; Lombardo, 2006; Agarwal & Tiwari, 1988; Atance & O'Neill, 2001; Padawer, Jacobs-Lawson, Hershey, & Thomas, 2007). This category includes also studies that have dealt with both dimensions individually, without direct comparison between the past and the future (Zimbardo & Boyd, 1999; Holman & Silver, 1998; van Beek, Berghuis, Kerkhof, & Beekman, 2010). These studies tended to simplistic, lacking study and analysis of the influence of the complexity of other temporal dimensions.
- The second type of group tended to focus on more than one temporal dimension. Most of these studies focus on the differences between the past and the future events with regard to the emotional, cognitive and mental aspects. The impacts of temporal location of an event on the behavior in present, given that the future and past events have a similar temporal distance from the present (Rumiati & Roncato, 1985; Buehler, Griffin, & MacDonald, 1997; D'Argembeau & Van der Linden, 2004; Bavelas, 1973; Mitchell, Thompson, Peterson, & Cronk, 1997; Wirtz, Kruger, Napa Scollon, & Diener, 2003).

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Moreover, there has been a paucity of research designed to directly compare the value of past events with the value of future events (for exceptions, see Caruso, Gilbert, & Wilson, 2008; Guo, 2008; Van Boven & Ashworth, 2007; Newby-Clark & Ross, 2003). Therefore in this chapter, we review previous work from diverse research domains that indirectly support the hypothesis that the value of objects and events changes over time or the future events are valued more than equivalent events in the equidistant past. In this part, we also review previous research that examined the differences between the past and the future events, and which can affect the Temporal Value Asymmetry hypothesis.

## 1.1. Temporal Value Asymmetry

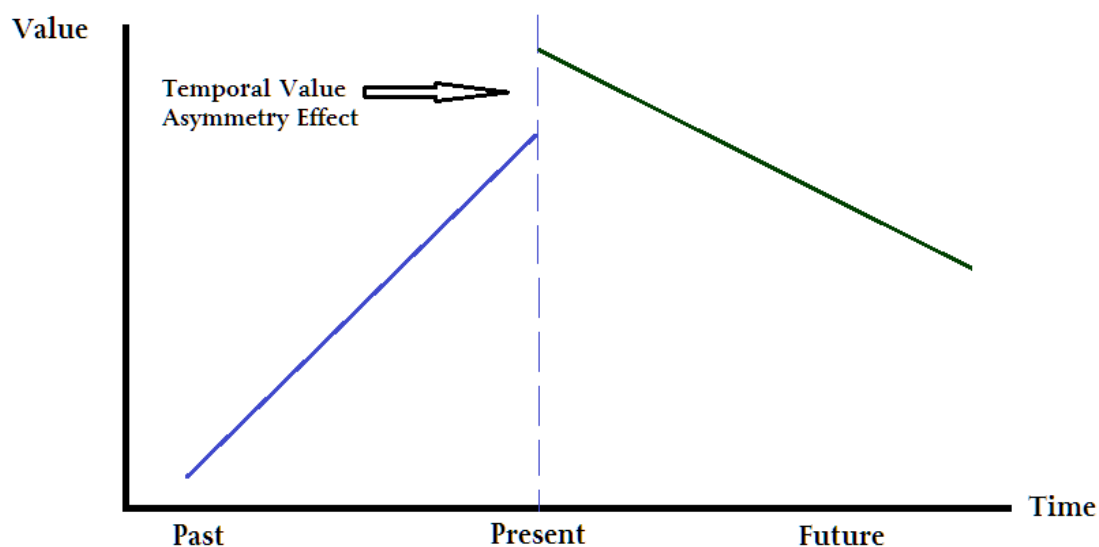
Humans may be the only who has the mental capacity to contemplate events in the past and those in the future (Suddendorf & Busby, 2003). There are manifold factors that go in to how a person will value the events that may take place in the in his life, one of them being the event's location in time. Empirical studies in recent years have shown that reactions of people to past events and those that are likely to occur in the future are not of the same degree; we note several differences between them and one of these being that the value of the event that already happened in the past is less when compared to the future event (Caruso, 2010; Caruso et al., 2008).

Although there are efforts to equate the value of events on factors such as importance and uncertainty, the many events tend to change in value throughout time. The value of objects and events changes over time. For example, the current monetary value of a certain mobile phone decreases with time, whereas the value of a certain artwork increases with time. Many factors can influence the value of objects and events, such as technology advancement, changes in supply and demand, and so on.



When all factors are stationary except the temporal locality of events, research shows that the value of events can be different according to the time of the event in the past or future. For example, Caruso et al. (2008) explored how people perceive the value of events that have happened in the past in comparison to events that have yet to happen. They found that with identical temporal distance people tended to evaluate events in the future more highly than the same event in the past. A series of experiments was conducted by Caruso and his colleagues, considered the first such study, clearly designed to investigate the temporal value asymmetry hypothesis. To examine this issue, they asked subjects to read pairs of scenarios describing two events, one of which occurred in the past and one of which will occur at an equidistant time in future. In one of the five experiments, participants estimate how much compensation they deserve for helping the neighbor move out of his home. Some participants imagined that they helped the neighbor one week in the past and other participants imagine that they would help him one week in the future. The study found that people give themselves greater compensation when they imagine that the help will be provided in the future. This indicates that participants perceived the same event as being more valuable in the future than in the past.

Construal level theory (Trope & Liberman, 2010), and time discounting (Kassam et al., 2008; McClure, Laibson, Loewenstein, & Cohen, 2004) suggest that the greater the distance of the future event from the present the less valuable this event is likely to be perceived as being. It is likewise probable that the value of a past event also decreases with increasing distance from present time. This reduction in the value of the past event should be more acute than with the future value. Thereby this difference may create a gap between the value of the past and the future, when the both have the equivalent distance from the present. This difference is probably what leads to the temporal value asymmetry effect.



**Figure 1:** Temporal Value Asymmetry Effect. Curve of diminishing of value of a past event with increasing distance from present time is more acute than curve of diminishing of value of a future event. Thereby this gap between the value of the past and the future may cause the temporal value asymmetry effect.

People give less value to past events than future events. There are many reasons for this possibility. One likely reason is that information which we know about the past is more definite and clear than what we know about the future. The future events are uncertain, thus this feature allows people to use their desires and aspirations to compensate for the deprivation and negative aspects that may suffer in life. People may believe they deserve more money for a job in the future than in the past because there is some possibility that this future value, or this future earning, will be greater than anticipated. Though there is much to be learned about the past that clearly is of great benefit to us, until time travel comes along, we can not change the

past. The future is approaching and the past is receding to obscurity. The future is a vast arena of possibilities, while the present is here and then gone.



Unlike the past, the future is possible to be positive or negative. We should anticipate that all possibilities or the largest amount of them will be alright and not assign overly negative. Positive hopes will increase the quality of life now. These positive anticipations, which need to be acted upon, do not even need to be accurate (Wilkins, 2001).

The future is more malleable than the past and the valuations can change the future, but not the past. The past is fact and the future is fiction. The future is vaguer and more changeable than the past. The ability to revisit the past may be a feature of ability to conceive of the future (Suddendorf & Busby, 2003). Religion, Law, ethics, and many other basic aspects of human culture profoundly depend on our ability to reconstruct past and imagine future events.

The future enables us the freedom to contemplate our values. The notion is nicely expressed by Lombardo (2006, p. 56):

“The future is a testing ground for our values. Through thinking about the future, we might choose to revise our values”.

In addition, the future gives us a greater ability to choose the values which are in line with our expectations. This ability, which is narrow in the past, makes the mechanisms and processes that affect human behavior more active and may be even more intense than of the effect of these mechanisms with respect to past event.

There are several factors which may explain why people tend to award more value to an event if it would occur in the future than if it had occurred in the past (Caruso et al., 2008; Van Boven & Ashworth, 2007). A major factor that could lead to the temporal value asymmetry effect is affective extremity. Emotional events tend to be highly affective. Empirical research supports the notion that emotional responses people have regarding past events are weaker in comparison to their responses to events in the future (Van Boven & Ashworth, 2007). In the neighbor help study conducted by Caruso and his colleagues, they found that participants who imagined helping a neighbor move in the future felt more tired, indicating that subjects in the future status reported more strong emotional reactions than those in the past status.

The expected emotions connected with future objects are more extreme than the recalled emotions related with past objects. When asked to think about events, both good and bad, from one's personal past and personal future, people expected specific events in the future to be more intense than those which had already occurred (D'Argembeau & Van der Linden, 2004). The remembered emotions associated with past events and the anticipated emotions associated with future objects may influence the evaluation of the events. The emotions connected with objects and events are frequently used as a basis for evaluating these objects and events (Hsee & Rottenstreich, 2004).

People have more strong emotion responses connected with objects in the future than in the past. The expected emotions related with the future events are more extreme than the recalled emotions connected with the past events. This may be a reason leading to decline in the value of past events in comparison with the value of future events, which can lead to the temporal value asymmetry effect.

Another aspect that could lead to the temporal value asymmetry effect is the asymmetric mental simulation. The value of events may differ according to the impact of mental simulation of future and past events. Some research indicates that people simulate future events more variably than they simulate past events. For example, participants generated more alternatives to viewing a movie in the future than to having viewed a movie in the past (Caruso, Seo, & Gilbert, 2006). Bavelas (1973) requested people to describe a journey itinerary. Some participants imagined the trip happened in the past or will happen in the future. Bavelas found that people gave more varied itineraries for the future trip than for the past trip. Mentally simulating an event in the future is less limited - allowing more free and expansive thought - than mentally simulating an event in the past. This difference is probably what led to the temporal value asymmetry effect. The more extensively people mentally simulate an event in the future, the more value they will attach to this object and event.

Improvement from past to present, and from present to future, would be more applicable easily to people lives than other tracks. This trend is also consistent with the evolutionary nature of human beings. There is no limit to human aspiration; people always seek to make their situation in the future better than it is now. A person has several goals for the future. Before achieving the goal, the topic of this target carries a special importance and value make a person doing more of an effort to achieve what he wants. But what gets mostly that after achieving the goal shape a new target, which in

turn again will have high value. In this case, the goal old becomes nice memory, but loses much its value, in particular if compared with to future goal. So long as there is a future, people will remain dreaming about beautiful future. The Future is opportunity to correct errors, and benefit from the past successes to achieve a greater success in the future.

## 1.2. Emotion Responses and Temporal Value Asymmetry

Emotion is a feature that affects almost all human behavior, as well as playing a major role in making important decisions in life. The emotional intensity of events differs over time but we are continually feeling some emotion, when we think about temporal events, whether in the past, present or future. Often these emotions make reference to events beyond the present. Creating information in the future and retrieving information from memory are not verbatim representations of the past and future, but are instead the most relevant to an individual's aims, beliefs, and interests (Conway, 2005) and emotion which play a significant role in this process. Therefore, emotional objects are evoked with more facts than neutral objects (D'Argembeau & Van der Linden, 2005; Kensinger, Garoff-Eaton, & Schacter, 2006).

Emotions and feelings are associated with the temporal dimension more than other dimensions. Some of those emotions are more focused and intense in the past, present, or future. Emotions such as hope, presumptively, are more focused in the future, while happiness distinctly has a present- focus, whereas the remorse is more associated with the past (Lombardo, 2006; Karniol & Ross, 1996). Both positive prospective emotion and negative prospective emotion (hope and fear, respectively) may give events in the future more value compared with the past events, i.e. the hope for a better future from the positive or negative past. Even if the past is good, people may dream of a

better future; the fear that future will be not as good as a past “good life,” or that negative qualities will continue into the future may be persistent. This hope and fear gives events more value to the future. What happened in the past has already occurred, positive or negative, but the most important now is what will happen in the future.

There are a number of probable reasons, why individuals might accord a particular importance to emotional information when they thinking about temporal events in past or in the future:

- Emotional information associated with a temporal event helps one to make adaptive decisions. The main function of emotional aspects of thinking about temporal events may serve to help one make adaptive decisions (Suddendorf & Corballis, 2007). Emotional aspects of events provide important information that enhances successful adaptation to life conditions. The driving force that we need for our decision making is the emotional charge associated with events (Ellsworth & Smith, 1988; Lazarus, 1991). Affective states and emotional responses associated with temporal events motivate us to reach at our aims, to make decisions and, to engage in specific types of behaviors (e.g., start a diet) or to avoid others (e.g., quit smoking). Representations of emotional events induce significant modifications of emotional responses and feelings (Damasio et al., 2000).
- Emotional information associated with a temporal event can serve as an emotion regulation function. Sometimes we remember or imagine optimistic events, not only to help in the decision-making process or plan our actions in the future, but just to feel better in the present. People may endeavor to maintain positive affective state by imagining negative events (e.g., how things could have been much worse), which allows them to feel better in comparison (Sanna, 2000). Many people may believe that the future event is more important and valuable than

the past event, which then makes them feel better about the events in the future.

- Emotional information associated with a temporal event helps people to construct and keep a positive view of the self. The emotional aspects of thinking about temporal events may be to provide tools to maintain a positive view of the self. People are more prepared to consider the facts that strengthen a positive view of the self than facts that promote a negative view of the self (Baumeister, 1998). Thus, thinking about events tends to be biased toward confirming positive self-images. People rely more strongly on the future than on the past for temporal self enhancement.

The expected emotions connected with a future happening tend to be stronger than the remembered emotions connected with an identical past happening (Caruso et al., 2008; Van Boven & Ashworth, 2007). People expected that they will be happier in a future holiday than they would be in a holiday that has occurred in the past (Wirtz et al., 2003). Van Boven and Ashworth studied the emotional responses associated with the future and past events. For example, they investigated how happy participants expected they would be on a vacation if a vacation occurs in the future and how happy they remembered they had been on the same vacation if it had happened in the past. The results of this study indicated that those who imagine that the vacation will take place in the future expected that they will be happier than those who imagine the same vacation in the past. People may evaluate the events based on their thoughts about how happy or unhappy they will be when these events happened in the past or will happen in the future. People may evaluate the future vacation more highly than the past vacation because they predict that the future vacation will be more fun. People may be willing to pay more money for a vacation if they predict that the vacation will be



more fun than they will if they predict that the vacation is going to be less fun.

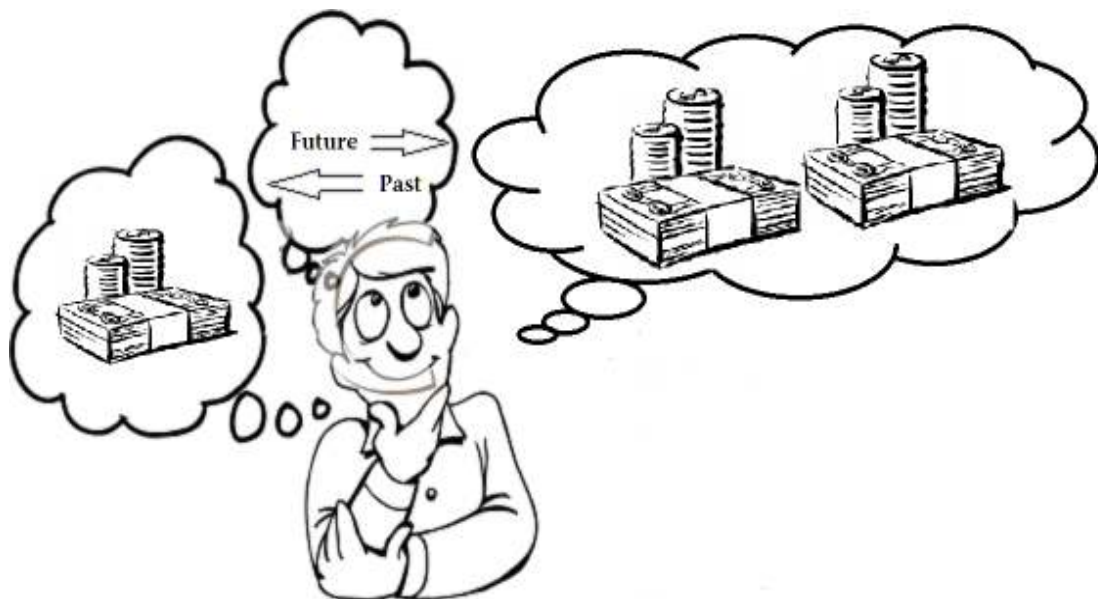
When people imagine future events, their emotional responses are more severe than when they remember same events in the past with a similar temporal distance from the current time (Caruso et al., 2008; D'Argembeau & Van der Linden, 2004; Van Boven & Ashworth, 2007). This greater emotional power of future events in contrast to past events is not limited to positive emotions, like happiness and joy, but also pertains to in negative emotions such as annoyance. For example, Boven and Ashworth found that when participants imagined something annoying happening in the future or past (for example annoying noise) they felt that they would be more annoyed when the event is in the future. This indicates that they focused more on the future events than on the past ones. Van Boven and Ashworth (2007) exposed participants to annoying noises (the disharmonic sound of an analog telephone modem connecting to an Internet service provider) and asked participants to contemplate either having already listened to an annoying sound 20 minutes in the past or awaiting this sound in 20 minutes. Caruso and Gilbert (2006) found that people perceived the future times (seven days in the future) as being closer to the present than the past times (seven days back). This finding may indicate that people's emotional responses have a tendency to be extra extreme for future events than for past events.

There are several factors that may explain why people experience more emotion in the past than in the future. The coming events are more controllable than events which are receding into the past. People prefer to control the events that haven't occurred yet even if they are difficult to predict or control them (Langer, 1975). Ability to control future events makes people's emotions more intense than past events, and this may lead to an increase in the value of future events. The future events are more uncertain and unclear than the past events. Past events have already

happened, people know much more about the factual details of these events, and this can reduce the uncertainty and unknown aspects about events in the past (Grant & Tybout, 2008). On the other hand, the future event has a feature that is not found in a past event. The future events did not happen but will happen, and this gives them status of vagueness and indeterminacy; the details of the results are unclear in this case. Even when the events in the past are unknown, people may perceive less uncertainty about the event itself because they know that some outcome has already happened. People prefer to watch a football match live on television rather than watch the replay of this game (Vosgerau, Wertenbroch, & Carmon, 2006). Watching a movie in the first time causes more excitement and more pleasurable experience than watching the same movie for the second time. The uncertainty of the future compared with the past events may make the future event more severe and the intensity of emotional experiences more extreme than the past event. Emotional responses are subdued after the event has occurred (Wilson & Gilbert, 2008), because people's curiosity about the events will end or will be reduced greatly and people's interpretations about events has become unimportant. Uncertainty during events makes unhappy events more negative and pleasurable events more positive (Bar-Anan, Wilson, & Gilbert, 2009).

The major role of emotion is in preparation of people for doing behaviors necessary towards life events (Frijda, 1988). The emotional responses that are created when people imagine the future events are a kind of preparations for the future events. These emotions can help people to be ready for the future events. On the other hand the emotional responses that are created when people imagine the past events do not serve this purpose, because the future events are approaching while the past events are receding. Fear of something allows man to act with care and caution regarding potentially hazardous events (Marks, 1987). These preparatory emotions are more helpful for acting on events that will come in the future (if you will see

a snake in your home tomorrow) than for acting on events once they have occurred (if you saw a snake in your home yesterday). This important feature and its impact on human behavior may be an important element in the evaluation of events. For example, a happy man may tend to extreme evaluations of events. As we have mentioned, people are happier in the future than the past. Therefore people may evaluate past events as being less valuable than future events, not only because of the differences extent of happiness, but because of the emotional intensity differences which tend to favor the future.



The emotions associated with the future and past events and the emotional responses evoked by thinking about future events are important factors that may explain why people gave the future events more value than the past events (Caruso et al., 2008). The more extreme the emotional responses evoked by thinking about a future event are, the greater the differences will be between the perceived past and future event values (of imagined event). Emotional events tend to be highly affective. People may

think about emotional events in the past in a less extreme fashion in comparison with their thoughts about emotional events in the future. The differences between strength of emotion responses elicited by thinking about future and past events (i.e. the future emotional responses are stronger and more intense than the past responses) are possible to make future events closer emotionally and more important effective than past events thereby influencing evaluation of temporal events so that the value of future events are more valuable than past events.

People are very skilled at making sense of emotional events by rationalizing them so that once the events have occurred, the emotions connected with them turn out to be less strong and less effective (Wilson & Gilbert, 2003). The emotions related with the past and future may influence the evaluation of the events. The emotions connected with objects and events are frequently used as a basis for evaluating these objects and events (Hsee & Rottenstreich, 2004). As several studies have shown, people's emotions are stronger and more positive when they experience a future event than a past event with same distance from present. This phenomenon, which refers to the asymmetry of emotions associated with the temporal events, can lead to the temporal value asymmetry effect. People may value future events more than past events because people's emotions are deeper regarding events they expect in the future and because they often use their present emotional statuses as information about the value of the events they are contemplating.

The argument that temporal asymmetry in judgments of value is the consequence of systematically different emotional reactions to past and future events is not a sufficient explanation for temporal value asymmetry effect. It is possible; however, that this effect is not inherent only in the emotional response to the situation, but that also it is the result of a systematic difference in how people interpret past and future events. Some mediators such as emotions connected with future and past events, and mental

simulations of future and past events could affect the value of the past and future events. The following section will review previous research that examined how mental simulations events could affect the value of the past and future events.

### **1.3. The Temporal Asymmetry in Mental Simulations**

People may be less likely to mentally simulate past events in as much of a personally involved manner as compared with their mental simulation of future events. When we think about temporal events, mental simulation of future events is different from mental simulation of past events. Mental simulation of future events is more associated with realistic information, more easily and more creative than mental simulation of past events. The future events did not happen but will happen; this makes it more freedom from realistic details. While past events have already happened, people know much more about the factual details of these events, and this can reduce the ability to imagine and mentally simulate events. The mental simulation of future events becomes more relevant and closer to reality.

An example to explain the differences between mental simulation of future events and mental simulation of past events: Mentally simulate a year college for a university student that either happened 1 year in the past or will happen 1 year in the future. The simulated one university year differs according to time of its occurrence. A new year is open to the possibilities and imagination here is bigger and easier, while the events of a previous year may be more concrete than the details of upcoming year, the latter being informed by that which has occurred. The probable details for an imaginary year in the past may therefore be more exact. The differences in mental simulation of future versus past events may be an important factor in explaining why people gave the future events more value than the past events.

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Mental simulation into the distant future will lead to a greater difference between the perceived past and future event values.

People have the ability to mentally simulate a past that did not happen, but even when people do that, they do so in a manner that is correlated with details of the past (Kahneman & Miller, 1986; Roese, 1997). On the other hand, mental simulation of the future event may not be totally independent from the real events that occurred in the past, but the available space to add desirable values and to exaggerate in the evaluations is greater when mentally simulating the future than mentally simulating the past. Thoughts which are not logical significantly are not acceptable to the person. People may not overindulge optimism when they imagine the future, because reality limits the fancies and perceptions of future.

Some research indicates that people simulate future events more variably than they simulate past events. Mentally simulating an event in the future calls for more expansive imagination than mentally simulating an event in the past. This difference is probably what leads to the temporal value asymmetry effect. The more expansively people mentally simulate an event in the future, the more value they will attach to this object and event. Van Boven, Kane, and McGraw (2008) asked participants to expect some events in the past or to remember the same events in the future, and they found that subjects reported more expansively when thinking about future events than past events.

The temporal asymmetry of mental simulation makes the feeling of past events different from the feeling of future events. This may lead people to evaluate the same event differently regarding whether it has or has yet to occur. The temporal asymmetry of mental simulation, can lead to the temporal value asymmetry effect. People when thinking about future events have the ability to think about a larger amount of information than when they thinking about past events. Therefore, the evaluation in the future has

more freedom from reality constraints and allows more freedom for fantasy; therefore this may allow a person to think more positively about the future. He can't think this way about the past. This narrowing of the possibilities for mental simulation in the past may be a reason leading to decline in the value of past events. Expansion of mental simulation in the future may be a reason for the increase in the value of the later events. People have more latitude to determine their future goals in line with their needs, because of freedom from frameworks realism in mental simulation of future events (Robinson & Ryff, 1999).

#### **1.4. Cultural Differences in Temporal Value Asymmetry**

Some cultures value the past more than the future, whereas others value the future more than the past. A society may prefer focus on the past, present, or the future. An individual may be socialized by her national culture to focus on the past. For example, Oriental society attaches great importance to the habits and traditions and historical norms. Western society is more open to the future, and therefore, in conjunction with several factors, witnessed a growth that led from the beginning of the Industrial Revolution in Europe to the scientific and technological revolution of our century. It is noted in Western culture that the tradition in some subjects such as women's work and marriage have changed and become more modern. The traditions in Oriental society also have changed, but not to the same degree of change as in West. This indicates that Western culture is less focused on the past than Oriental culture.

Guo (2008) examined the influence of people's culture on their evaluation of future and past events. To address this issue, researcher has developed scenarios that ask people (Chinese Canadians and European

Canadians) to estimate the value of events in the past or future. For instance, in one scenario, participants imagined that they had either received a proposal of a room for a holiday from a friend in the past or they would receive the same proposal in the future. Participants then told the quantity of money they plotted to expend on a gift for the friend. Guo in this scenario found that European Canadians expend more financial value on the gift in the future than in the past, whereas Chinese Canadians expend more money in the past than in the future.

Although we can find in almost all cultures the past, present, and future orientations, they (the cultures) differ in their preferential ordering of these orientations (Brislin & Kim, 2003; Seginer, 2003). Chinese would attach more value to past events than to future ones. Because Chinese people give greater importance to past events than future events, and because they focus their attention more on past events than on future ones, they have more extreme emotions when thinking about past events than when thinking about similar future ones. In addition they demonstrate more expansive thinking about past events than future events. Furthermore, they mentally simulate future events less extensively than past events (Guo, 2008). As a result, the Chinese showed a reversed temporal value asymmetry outcome (i.e. the value of past event is more valuable than future event). Ji, Guo, Zhang and Messervey (2009) found that Chinese would attend to the past information more than would Canadians. The Chinese remembered more detail about past events than did Canadians, which may partially explain why the temporal value asymmetry effect among Chinese was reversed for in contrast to European Canadians.

There are several studies comparing different cultures regarding the relative importance for the future in life. Some researchers found that cultures were more future oriented than other cultures. In one instance, Heckel and Rajagopal (1975) found that American people have a stronger future orientation than their Indian counterparts. Some of the findings



indicated that people from Singapore are more future oriented than Australian people (Poole & Cooney, 1987).

There are cultural differences in the importance of future events in the personal life. It should be noted that some societies focused on future events more than other societies. In addition, there are cultures that, in comparison with others, may be less focused on the past events. It is believed that most of the cultures give future events more importance and value than past events. Most cultures have the temporal value asymmetry effect, but the degree of this effect may differ from society to society. In one society, people may evaluate the future, much higher than the past. People in another society may find that the future also has a value higher than the past, but to a lesser extent than in other societies.

The temporal value asymmetry effect is the result of interactions of several psychological, mental, and emotional processes, which are a highly affective for most or all people. For example, the future must be more valuable so that people can correct past mistakes and to overcome the problems of the past. This adaptive mechanism exists in most of the people, whether they belong to Western or Eastern cultures. The culture may however play an important role in how to deal with problems. Some people resort to religion, others depend on family advice, while still others prefer self-reliance in solving problems. In addition some communities resort to mythical thinking as the magic and sorcery.

## **1.5. Temporal Asymmetric in Positive and Negative Events**

Temporal Asymmetric theory supposes that the value of events in the future is greater than in the past. According to this hypothesis, positive events

should be more positive or of more value in the future than in the past, and negative events should be more negative or of less value in the future than in the past. People show a strong bias towards overestimating the intensity of affective responses to future events (e.g., negative events in the future often turn out to be more benign than expected). Subjects felt that positive future events were closer in time than negative future events. They rated positive events in the future as being more positive than positive events from the past (Cameron, Wilson, & Ross, 2004; Schacter, Addis & Buckner, 2008).

There are some findings that suggest that persons evaluate unpleasant or non-good future events more negatively and future good events more positively, than the same events in the equidistant past. This prediction was confirmed in a series of studies that examined people's thoughts about negative (unfair actions) and positive behaviors. In one study, Caruso (2010) asked participants to imagine that somebody wants to give a donation to aid in the construction of a much-needed homeless shelter in his city. Some participants imagined that this man made his donation one month prior, and others imagined that this man will make it one month in the future. People rated the donation as being more generous when it would be made in the future than when it had been made in the past.

In other studies, people judge misbehaviors that are about to happen more negatively than identical misbehaviors that have previously happened. People who are who commit an offense against another deserve greater punishment in the future and the aggrieved person deserves more compensation in the future than in the past. In one study, participants awarded largest quantity of money to the aggrieved person of an accident who was about to suffer for six months in the future than to one who had suffered for six months in the past (Caruso et al., 2008).

The value of both negative and positive events may be diminished after they have already occurred. If the person in consideration has done

something negative, the public will have an extreme negative reaction when considering the action in advance, but may be relatively more understanding sometime after the deed has been done. This psychological process helps people to feel better about their past quandaries and about negative events. This process can make forgiveness more likely.

Newby-Clark and Ross (2003) examined people's beliefs about bad and good events which will possibly occur in the future or have already taken place in the past. They found that the ability to imagine positive future events is easier and faster than imagine negative future events. On other side, there was no difference in the time taken to create past negative and past positive events. Thus, imagining negative events in the future appear to be more difficult than negative events in the past, and imagining positive events in the future appear to be easier than for positive events in the past (Kermer, Driver-Linn, Wilson, & Gilbert, 2006). This may be an indication that the mechanism of granting future events more value compared to the past events is stronger than the reverse mechanism, i.e. give granting future events less value compared to the past events. This may be one of the causes of the temporal value asymmetric effect.

## **1.6. Thinking About Time (Past and Future)**

The ability to understand time allows a person to imagine themselves back in time to remember past events or ahead to pre-live events (Suddendorf & Corballis, 1997). The ability to remember subjective events from the past and the ability to expect future events emerge in tandem, between age three to five (Gopnik & Slaughter, 1991; Busby & Suddendorf, 2005; Botzung, Denkova, & Manning, 2008). The future will become the present, and the present eventually becomes the past. Comprehending time enables us to contemplate events at different points along this continuum. Naturally then, a

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great amount of time in the lives of people is going to involve thinking about past and future events. The ability to think intelligently about the future may be uniquely human. The ability to think about time enables us to comprehend events at different points in terms of past and future.

To think that the future events have great value may be an evolutionary and instinctive behavior that developed for man to survive; it provided him with an ability to handle environment variables. This instinctive behavior may be found in many animals. For example, an animal can hoard an ample amount of food in the summer for use it in the coming winter. Such behaviors may typically be largely instinctive. This behavior suggests orientation to future, but it does not suggest that the animal can think intelligently about future events (McKenzie, Bird, & Roberts, 2005).

Suddendorf and Corballis (2007) argue that the primary function of mental time travel (thinking backwards in the past, forwards in the future) is to enhance biological fitness in the future. Mentally simulating various versions of the future, and their respective consequences, is a crucial cognitive adaptation, enhancing planning and deliberation by allowing a subject to mentally simulate and evaluate contingencies in the present in order to increase one's future survival chances. Mental time travel into the past is subsidiary to our ability to imagine future scenarios (Dudai & Carruthers, 2005; Suddendorf & Corballis, 2007). The thinking about the past events of and imagining of future events may be accountable for the understanding of continuity between past and future, and the notion of time itself. The main role of thinking about the past is to provide data from which to construct and imagine probable futures.

Although there are some similarities between thinking about the past and future, there are also some notable differences. The purpose of thinking about the past is to inform and allow the anticipation of the future. People tend to think about the past events in two ways: either they remember an

event that already happened in the past, or they imagine an event that could have happened in the past but has not happened already. When people try to imagine a past event they cannot get away much about the details of the old fact.

People's thoughts about the future can be classified into thoughts about attainable future events -- those they think are likely to happen in the future -- and thoughts about unattainable future events, or those that they believe are unlikely to occur. The criterion that determines how difficult something in the future will be is derived from the actual challenges that people remember from their past experience. People know that it is illogical to take imagination very far from reality. Imagining an excessively rosy future is seen as a form of madness or extreme imagination. People's thoughts about the future and past events are governed by the logic derived from the experiences of life. Although imagination of the future is not completely free from reality, people will generally think about future events as being more independent of the restrictions that thinking about past events involves. Overcoming future difficulties is easier than overcome the past difficulties, because the time is not likely to roll (excluding quantum dimensions) back. When people imagine future events the reality of life can harass the person, but it cannot imprison or cancel the desires and aspirations of people in future.

A large body of research indicates that people are not strictly realistic in how they think about their own future (Aspinwall, 2005). They may plan for the future in an exaggerated overly-optimistic manner (Buehler et al., 1997; Newby-Clark, Ross, Buehler, Koehler, & Griffin, 2000; Buehler & Griffin, 2003; Weinstein, 1989; Heckhausen & Krueger, 1993). When people are thinking about future events they focus on factors that improve their own chances of achieving their goals but they neglect to consider other factors that are likely to cause problems and obstacles in satisfying their desires (Buehler,

Griffin, & Ross, 1994; Lam, Buehler, McFarland, Ross, & Cheung, 2005). People can decrease the number of factors that can lead to failure or they reduce the impact of these factors and make them more suitable to the wishes of the person and his plans. Optimistic thinking is associated with future events and is not related to past events. A person knows that his current actions can affect the future but not the past. The past events do not have optimism as a feature because they happened beforehand but the future events are open with possibilities. This makes optimism an important factor when thinking about events in the future, which in turn may lead the person to give future events more value than past events. People can absorb imaginative opinions about events in the future that probably will not happen but could conceivably happen. When people are confronted with a moral dilemma in the future they tend to believe they would behave more ideally than they really do (Tenbrunsel, Diekmann, Wade-Benzoni, & Bazerman, 2007). Thinking about future events tends to be more extensive and more pertinent to our situation than thinking about past events. People think that they will do many good things in the future (may be in extreme way) and they imagine that the probability of occurrence of the positive events is more likely than the probability of occurrence of negative events (Peetz, Wilson, & Strahan, 2009).

The facts concerning private past events can be used to create perceptions of a future in which certain situations should be approached and others avoided. Thus, thinking about future events tends to be biased toward confirming positive self-views. One of the most important aspects of future thinking in humans is that people can hold in mind a wish or goal state that impels them to continue to work tirelessly to achieve it. Memories of past events and images of future ones are not verbatim depictions of the past and future. Positive memories remind people of their past accomplishments and provide cues on how to restore previous successes in the future. On other hand, negative memories remind people of their past errors and provide cues

on how to avoid undesired outcomes or minimize their consequences in the future.

There is one important note that should be mentioned regarding the connection between thinking about the future and thinking about the past. Although the logic of future thinking depends on previous experiences of the person, the act of imagining future events often requires us to go beyond the limits of those memories. The belief that future events will be the same as past events hinder personal development and success and may lead to despair and the inability to solve personal problems. While the notion that the future will not be like the past pushes people to act more effectively in hopes that the future may be the better than the past. By being able to imagine an infinite variety of future scenarios, humans were allowed the flexibly adapt to ever changing environmental conditions and circumstances (Atance & O'Neill, 2001).

Research suggests that thinking about past events feels more difficult than thinking about future events. For instance, Van Boven et al. (2008) asked people to imagine that they will go to their dentist in the future or remember a previous visit in the past. He found that participants reported that thinking about past dentist visits was more difficult than thinking about future dentist visits. Although most people have experienced a dentist visit, thinking about the future visit is easier because the person forgets the potential problems or reduces their importance. While when someone remembers previous visits to the dentist, negative memories may be dominant.

One can say that past events may lead to an increase in the value of future events, which will reduce the likelihood of negative future events. Future events do not serve this function for the past events. For example when a person faces a new situation has no previous experience around it (as a lecture for the first time). The Person may be more

worried than when he confronts the same situation in the second time. On the other hand, compared with the past event, a person may think that whatever happens, nothing could be worse than the first time.

Thinking about the future events is more extensive, more optimistic, feels less difficult, more imaginative, and freer from limitations of reality than thoughts about past events. Consequently, people tend to attach more value to future events than to past events. These findings may indirectly suggest that people tend to attach more value to an event if it could happen in the future than if it had happened in the past. Thinking about future events produces a greater affect than did thinking about past events and this difference may cause the Temporal Value Asymmetric effect.

### **1.7. Evaluations of Self and Others in the Past, Present, and Future**

Kanten and Teigen (2008) report that compared to the past, people evaluate themselves in the future as being superior to their present or past selves. In addition people expect the amount of their improvement to be greater than the amount of improvement in other people. We do not only compare ourselves to other people, but also to our past and perhaps even to our future selves. We expect that our future be more positive than our past. People tend to believe that they are more susceptible than others to experience optimistic events in the future and less susceptible than others to experience harmful events in the future (Kanten & Teigen, 2008; Shepperd, Carroll, Grace, & Terry, 2002; Weinstein, 1980; Nelson & Beggan, 2004; Johnson, 2009).

The temporal value of effect is stronger when people evaluate the personal value of an event (the values of the events correlated directly to the person who evaluates the event) than when they evaluate an impersonal value



of an event (the values of the events earned by other people and not the person who evaluates the event). For example, when people imagine that they provided help to another person or another person provided help to them, people choose for the other person a reward that was 37% more expensive when they imagined this help in the future than when they imagined it in the past. On the other hand, people choose for themselves a reward nearly double the reward that they believe the other person should receive (71% more expensive) when they imagined the help in the future than when they imagined helping him in the past (Caruso et al., 2008).

## 1.8. Motivation

Motivation depends on how persons contemplate past and future actions (Seijts, 1998). Motivation is another component that can explain why people place more value on future events than past events. Motivation has an impact on imagining temporal events. The person wishes a better future than the past; another may prefer to simply avoid re-living negative events in the future. In other words, a "towards" person will move towards what they like and want to achieve in the future, whereas an "away from" person will move away from what they don't like, or from some troubling past (Smith, 2004). Most human actions are motivated behavior. Motives raise a human behavior that is meant to achieve specific goals in the near or distant future. This leads to standing attempt to improve the self and self-realization in the future (de Volder & Lens, 1982; Armor & Taylor, 2003; Raynor & Rubin, 1971; Oyserman, Bybee, Terry, & Hart-Johnson, 2004).

Goals can either be short- or long-term, and they can be also negative or positive. As the psychologists Karniol and Ross (1996) note, there is significant variability across the spectrum of individuals in setting long term versus short term goals. A positive goal motivates people to desire an event or

status they may attain. Positive goals motivate people to evade events in the future they as opposed to being forced into a situation one must escape from. But in both cases, future events have great value in people's lives. Expectation of positive things in the future leads to act seriously to reach the desired end. Expectation of negative things in the future leads to do the necessary measures to avoid damage in the future. Thinking that the future may not be okay doesn't mean that the value of future events is not high, but may reflect the strong fear of the personal future. When a person expects adverse events, this does not necessarily mean they desire to such circumstances in the future, but it may reflect the influence of environmental, psychological or social factors. Thus the negative goal does not indicate a wish to achieve something negative in the future, rather shows a will or desire to avoid this future event.

The passion to attain the ideal life situation in the future will become the motivating factor that may will prod and push man to give a future event more value than a past event. The outcome could well be the same for what drives a "towards" person, and what drives an "away from" person. The logic of motives in the past vs. future can influence the outcomes of evaluation of temporal events and therefore this may lead to the temporal value asymmetry effect. Past events may be positive, negative or neutral in value. When people remember past events, they often do so in a motivated fashion, reconstructing themselves in a more brilliant self-image. Negative past event motivates people to avoid to repeating it in the future. Positive past event motivates people to desire to repeat it in the future, whether in same degree of positivity or in a more positive manner than before.

The natures of these motives are essentially techniques to orient ourselves towards an understanding of and bettering of our future human behavior is ordered so that it may meet our needs and desires, and help us to

succeed or resolve difficulties. People have motivation toward the future, but they do not have such motivation toward the past. Motives associated with future and past events may affect the value of the past and future events and they may be one of the reasons that lead to the temporal value asymmetry effect, and therefore the value of the future event is more valuable than past event. People try to improve their future; the opportunity to do so exists in the future.

## 1.9. Mental Health

Mental health may include the hope and the motivation to enjoy life. Therefore, it can be said that mental health requires an optimistic view of the future. Conversely mental illness can be defined as an adverse view of the future. Accompanying schizophrenia are other changes in temporality. The future becomes less important, the past comes to predominate to an unhealthy degree. For the normal person the future is open, in that there is planning for the future, there are expectations, intentions which are projected into the future, and so on. The future is not open for mentally ill individuals. For them the future appears empty because nothing is projected into the future. Reciprocally, cultivating and maintaining positive goals for the future enhances present well-being, whereas the anticipation of disaster and misery in the future brings down a person's present emotional state (Karniol & Ross, 1996). Depression was associated more with past events than future events, whereas the opposite was the case with anxiety (Eysenck, Susanna, & Santos, 2006).

Depressed persons have a temporal focus, which is less future oriented and more concentrated on the past (Moore, Hofer, McGee, & Ring, 2005). Depression, in fact, could be seen as a disorder of person's perception of the future (De Leval, 1995). For the depressed individual, the future seems

empty of the possibility for improvement; there is a sense of helplessness about making a better future (Kuhls, 1991). Predicted negative events in the future may lead to depression. Hope is associated with the anticipation of positive events in the future (Snyder et al., 1991). Hope is an associate to happiness psychological health. Conversely, depression is connected with the loss of expectation of optimistic events in the future or the expectation of undesirable future events. The person in despair expects that the future does not promise positive or important events. Both depression and apathy (the lack of feelings about the future), depress thinking and imagination. Hope motivates people into action while despair inhibits the active action.

Depressed individuals are less focused on the future and more focused on the past, this may mean that depressed individuals gave the past events more value than the future events, i.e. future events are viewed more negatively than past events. Such an outcome may also include individuals who gave the same value for both past and future events (i.e. both events have same negative value). The basic premise is that future events contain less value than the past events for a person in this negative state of being; i.e. the future is more negative or less positive than in the past. During the course of their depression, individuals want to go back to their past when things were perceived as better (De Leval, 1999). De Leval examined the relationship which exists between the quality of life and depression rests is the temporal dimensions in a group of 110 clinically depressed psychiatric patients. De Leval asked participants to describe their feelings at present, their feelings in the past, and to predict how they would feel in the future. Findings indicated that time stops and the present lasts interminably, the past is psychologically under- or over estimated and the future is unthinkable. For such a person the future becomes so unclear that it vanishes. To escape from his depression, he must therefore recover his past, or more exactly, that part of his past "when he was well". Predicted negative events in the future per se do not necessarily

cause depression. The extreme form of despair may lead to depression, i.e. when person believe that he is incapable of doing anything to these future negative events.

People who suffer from obsessive-compulsive disorder (OCD) are plagued by intrusive thoughts that they often over-ascribe meaning in order to prevent future (negative) events (Janeck, Calamari, Riemann, & Heffelfinger, 2003). This frequently prevents active future action planning, in that patients with obsessive-compulsive disorder are caught in repetitive behaviour in order to escape from anticipated danger or from future mistake (Suddendorf & Corballis, 2007).

The positive expectations in the future will further the quality of life now. For the normal person, the value of events is more in the future than the past. However, this temporal value should stay in a balanced form. The mentally ill come in degrees of intensity, with mania and anxiety being the extreme form of hope. Optimism helps a person to achieve his goals, but exaggerate the value of future events may preclude effective future action planning. Extreme focus on the future can hinder happiness and enjoy life and may create more stress and anxiety (Bandura, 2001; Fried & Slowik, 2004). Temporal value may be considered as just a part of a set of tools that allow us to escape from the present, forget past events, and imagine a better future.

## 2. EXPERIMENTAL STUDIES

The primary goal of the present study is to test the influence of temporal information (past, future) on the value of events. More specifically, we are interested in examining the changes over time of the value of events; we wish to investigate the changes that occur when people consider events in the past and then we wish to compare this with how events in the future are perceived by the respective people. Many researchers have suggested that people experience a less intense affect when they think about the events in the past in comparison with events in the future (D'Argembeau & Van der Linden, 2004; Van Boven & Ashworth, 2007). For example, Newby-Clark and Ross (2003) found that the people give a more positive rating to future events than those of the past. This may indicate that the future is more important than the past events because the future gives people the ability to think that they have degree of control over future events in their life, the future is an open book, whereas the past always stays the same. Caruso et al. showed that the value of computer data entry job was higher in the future condition vs. the past condition (Caruso et al., 2008).

Among the three studies, we made simple comparisons between the amount of money participants attached to work in the future works and the past works. The present dissertation aims to study the temporal value asymmetry hypothesis; that is, to examine if temporal events in the future condition are more valuable in comparison with the past condition. The central questions which the first study aimed to answer were, "Is it possible to see that there is a change of the monetary value of the job when we compare the value of the job in the past with the same job in the future?" Study 1 included two tasks: "entering data into a computer job and newspaper distribution". This study sought to examine whether the temporal value asymmetry effect would occur in both tasks. Moreover, Study 1 aimed to

investigate the effect of the job preference on the temporal value of the computer and the newspaper distribution job. We were interested in examining the effect of emotions on the temporal value asymmetry notion through investigating the effect of the job preference on temporal value of this action. In addition, Study 1 tried to investigate the effect of gender on the temporal value asymmetry. In the second study, we sought to explore whether or not there are cultural differences in temporal value asymmetry. The third study was specifically designed to investigate the question of whether the temporal value asymmetry effect would emerge when participants valued an impersonal event or this effect would emerge just when participants valued a personal event. We sought to uncover whether participants in the impersonal value condition will show a classic temporal value asymmetry effect (the value of the impersonal event was higher in the future condition vs. the past condition) or alternately, would they display no temporal value asymmetry effect (no difference between the value of the impersonal event in the future and the past). If emotional reactions mediate the temporal value asymmetry, then the temporal value of events should be stronger when people evaluate a personal event than when they evaluate an impersonal event.

## 2.1. Study 1

In the present study, we asked three hundred students (divided into groups concerning the past and the future) from the University of Tuebingen to imagine that they worked in the last four weeks, four hours per day entering data into a computer, in addition to distributing newspapers. For the other group it was asked that they imagine that they will complete the same job in the future - as opposed to the first group which contemplated having already worked. Participants reported the amount of money in euros that

they think they believed they should earn for each hour working at a computer and Newspaper distribution job. Finally participants indicated which job was more acceptable for them (entering data into a computer or newspaper distribution job).

The approach we have used in this study aims to examine if participants in the future job condition hope to earn more money compared with the past job condition. Based on these aim, two questions for the present work emerged:

1. Is the future monetary value of the computer-job higher than that of the past value?
2. Is the future monetary value of the newspaper distribution -job higher than that of the past value?

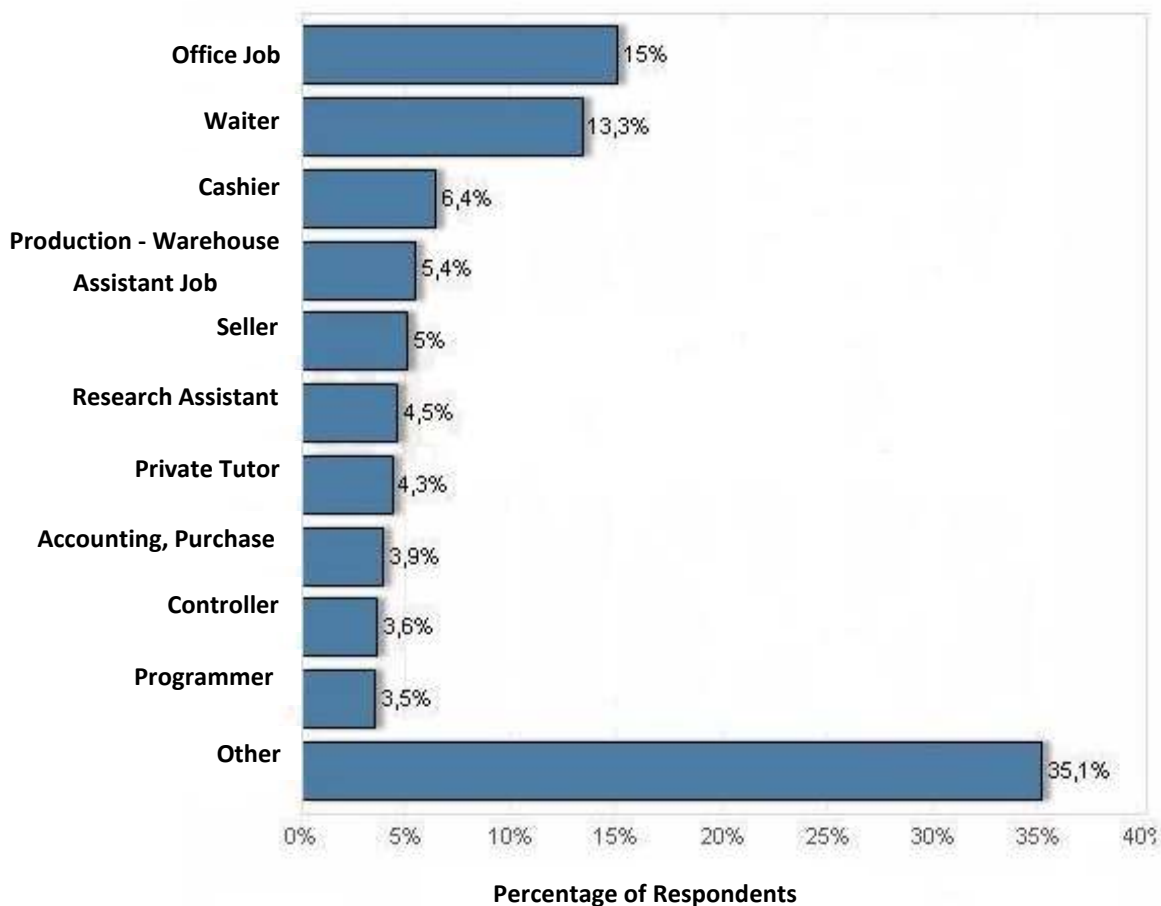
We chose this study on the temporal value of the work for students because work a part-time job during college is one of the most important and common forms of work that college students use in order to finance their studies. Several surveys indicated that nearly 70 to 75% of German students work a part time job during their university studies; for instance, this finding is apparent in the 2008 univativ survey and the Duisburg-Essen University Survey 2009 (Duisburg-Essen University, 2009; Univativ/ Commerzbank, 2008). The Darmstadt consulting firm univativ and Commerzbank survey, carried out in 2008 among 1000 university students in 23 West German universities, found that 75% of German students worked while studying at a university. They also found that for more than half of the respondents worked from 5 to 20 hours a week in order to finance their studies.

The univativ survey (2008) also showed (as indicated in Figure 2), the most common jobs types for students. The office job followed by waiter job in restaurants and then cashier job were, respectively, the most frequent income sources for students. The temporal events used in Study 1 concerned jobs in



the past and jobs in the future. The value of these events is represented in the monetary value of these jobs. In the present study, we used two tasks to examine whether the type of work influences the temporal value asymmetry:

- 1- Entering data into a computer job
- 2- Distributing of newspapers job



**Figure 2:** The Most Common Types of Jobs for Students (Univativ/Commerzbank, 2008).

Source: Statista Website (2011)

Computer jobs are one of the most common jobs for college students in West Germany (the office jobs). Distributing newspapers is, however, not one of the ten most common jobs for German students.

Therefore part-time employment has great value in a student's life, whether it has occurred in the past or will occur in the future, because the income from a part time job can help the college student to live and pay bills. Student Experience Survey commissioned by UNITE, carried out in 2005 in United Kingdom, noted that financial needs were a principal reason for term-time employment. For those who do have a part time job, three-quarters believe that they will not be able to afford university and pay tuition fees without the extra income. When asked why they worked, over two-thirds (68%) of respondents in the 2005 Student Experience Report did so to pay for basic essentials (Student Experience Report, 2005). The student job is an important event; therefore the monetary value of this event should be high value for the student. Therefore, we will examine in this study whether the monetary value of jobs changes over time i.e. the future value differs from the past value (Temporal Value Asymmetry) or there is no difference between the monetary value of the job as perceived in the future and in the past.

We predicted that with similar temporal distance the people tended to apply a higher monetary value work that will take place in the future, opposed to the value of the same work in the past. Moreover, Study 1 investigated whether the Temporal Value Asymmetry effect occurs only in entering data into a computer job or if it occurs in newspaper distribution jobs as well. In addition, we seek to demonstrate the sex differences in the temporal value asymmetry. Finally, study aimed also to investigate the effect of the Job preference on the Temporal Value Asymmetry theory.

## 2.1.1. Study 1 A: Temporal Value Asymmetry Theory

### 2.1.1.1. Method

#### Subjects

Participants were 300 students from Tuebingen University. They were 158 men (Mean age = 25.6 years) and 142 women (Mean age = 23.7 years). The sample was divided into two groups: 150 Participants in Past Group (83 males and 67 females) and 150 in Future Group (75 males and 75 females).

#### Design

This study used a 2 (Time: Past vs. Future) × 2 (Task: newspaper distribution job vs. computer job) × 2 (Gender: men vs. women) design. The amount of hourly payment which participants thought they should receive was measured as the dependent variable.

#### Procedure

The study was conducted using questionnaires administered to students enrolled at the University of Tuebingen. The job story, which was applied in Study 1a, was adapted from Caruso et al. (2008). Caruso et al. asked participants to imagine that they had accepted or they would accept to spend work 5 hr. entering data into a computer, and then to indicate how much money they thought they should be paid for total working hours. We used a story in our study that was similar to the job scenario conducted by Caruso et al. The new questionnaire in Study 1a differs from Caruso study in the following respects:

- In addition to entering data into a computer work, our questionnaire included also the job of newspaper distribution, where of Caruso, only included the computer job. In our study, we used two jobs so that we

could examine whether the type of work influences the Temporal Value Asymmetry.

- The work takes 4 hours every day (four weeks earlier or four weeks later) instead of 5 hours only once (one month ago or one month later) , so that the work should be perceived as a more important part of life.
- The participants estimated the monetary value per hour of work hours to avoid the problems in calculating of the number of hours that they were worked or would work in the future.

Participants imagined that they had agreed to work on a four hour- daily job to earn some money. The students were randomly assigned to one of the two groups:

- The past group: Participants imagined that they had worked 4 weeks previously.
- The future group: Participants imagined that they would work 4 weeks in the future.

Participants were asked to indicate how much money they received (in the past condition) or would receive (in the future condition) in cash for each hour of work? Afterwards, participants indicated how much they thought they should be paid for each hour of work, and then before the end of the questionnaire participants indicated which job they found more acceptable (entering data into a computer job or newspaper distribution job). They finally then indicated their individual gender and ages.

### **2.1.1.2. Results and Discussion**

Repeated measures analysis of variance (ANOVA) with the within-subject factors Job (newspaper vs. computer) and the two between-subject

factors Gender (female vs. male) and Time (past vs. future) was performed on the dependent variable “amount of required money”. Figure 3 depicts the mean of this dependent variable as a function of time, job, and gender. The ANOVA results are summarized in Table 1.

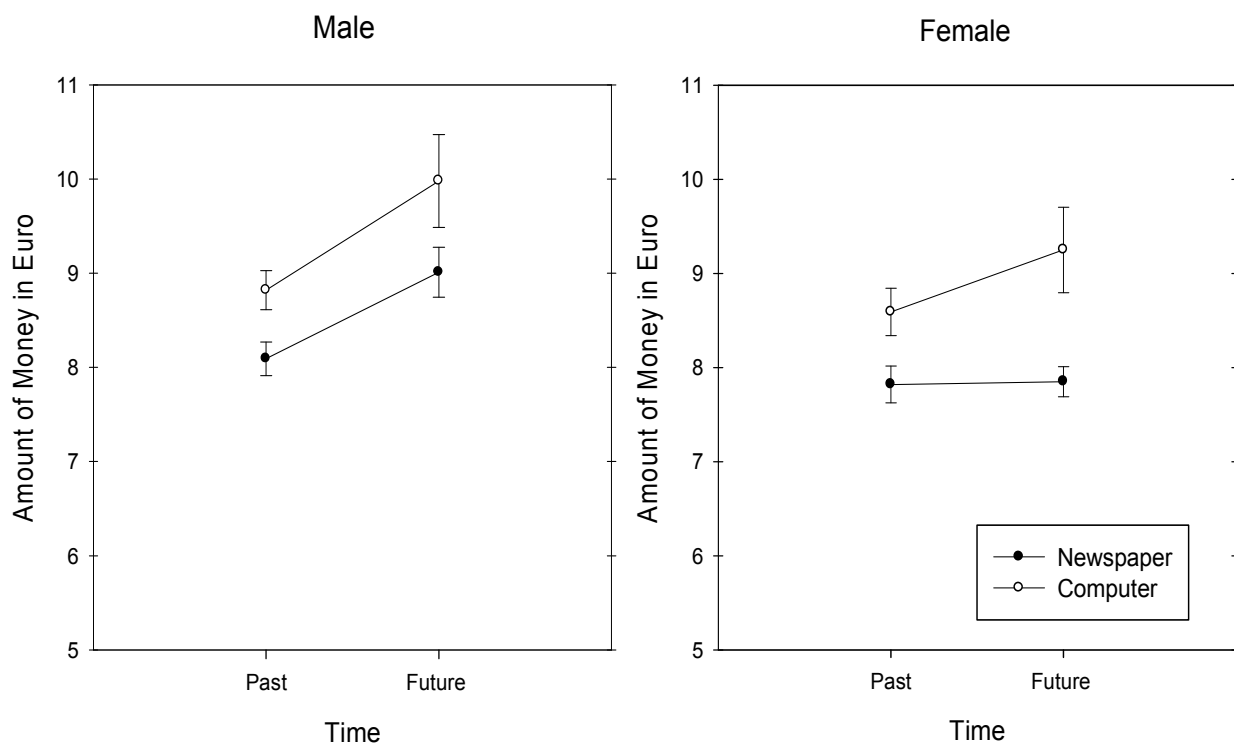
**Table 1**

Analysis of Variance of Study 1a.

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Gender	53.761	1	53.761	5.715	.017
Time	70.538	1	70.538	7.498	.007
Gender x Time	17.883	1	17.883	1.901	.169
Error (Gender, Time)	2784.640	296	9.408		
Job	139.801	1	139.801	34.098	.000
Gender x Job	2.012	1	2.012	0.491	.484
Time x Job	7.120	1	7.120	1.737	.189
Gender x Time x Job	1.409	1	1.409	0.344	.558
Error (Job)	1213.583	296	4.100		

There was significant main effect of Gender,  $F(1,296) = 5.71$ ,  $p = .017$ ; male participants tended to ask for more money than female participants (8.95 vs. 8.34 €). Theoretically important, however, there was highly significant main effect of Time,  $F(1,296) = 7.50$ ,  $p = .007$ ; consistent with the temporal value asymmetry, participants asked for more money when they considered that the work has to be done in the future rather than was

performed in the past (9.02 vs. 8.35 €). Furthermore, factor Job yielded a highly significant main effect,  $F(1,296) = 34.10$ ,  $p < .001$ ; participants generally required more money for performing entering data in a computer than for delivering newspapers (9.17 vs. 8.19 €). The main effect of Time, however, was neither significantly modulated by Gender,  $F(1,296) = 1.90$ ,  $p = .169$ , nor by Job,  $F(1,296) = 1.74$ ,  $p = .189$ . Finally, neither the two-way interaction of Gender and Job,  $F(1,296) = 0.49$ ,  $p = .484$ , nor the interaction of all three factors,  $F(1,296) = 0.34$ ,  $p = .558$ , approached statistical significance.

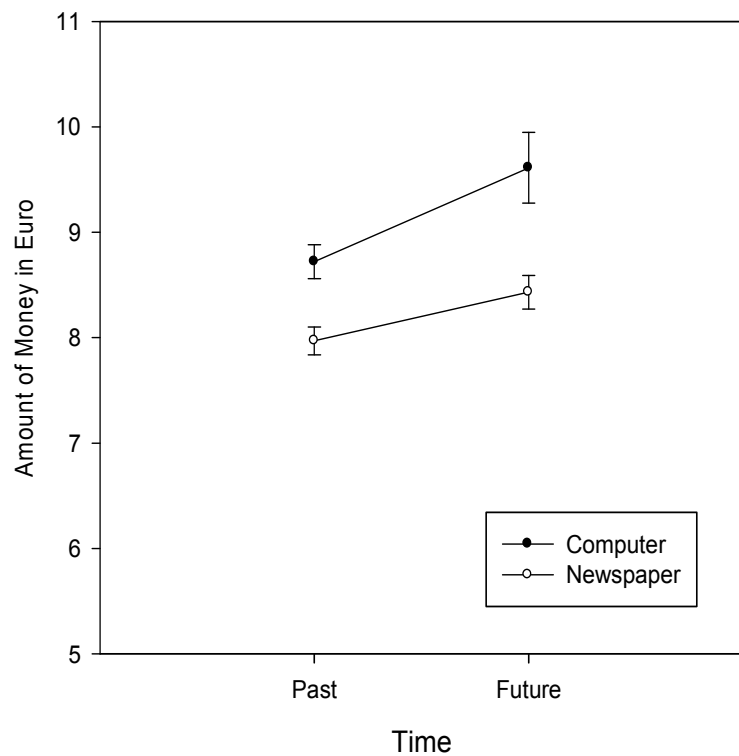


**Figure 3:** Results of Study 1a. Amount of required money (€) as a function of time and job. Left panel depicts the results for males and the right panel for females. The error bars show the standard error of mean, that is,  $\text{Mean} \pm 1 \text{ SE}$ .

A univariate analysis of variance revealed that males awarded more monetary value of the computer job when they imagined their job in the future than when they imagined the same job in the past (9.98 vs. 8.82 € per hour) and this difference was significant  $F(1,156) = 4.98, p = .027$ . Furthermore the male participants awarded more monetary value of the newspapers distributing job when they would do the job in the future than when they had done the same job in the past (9.01 vs. 8.09 € per hour) and this difference was also significant  $F(1,156) = 8.43, p = .004$ . However, we found that the female group valued the newspapers distributing job nearly the same monetary value in the future and in the past (7.85 vs. 7.82 € per hour). This difference was not significant  $F(1,140) = .01, p = .919$ . Furthermore the female participants asked for more payment of the computer job when they would do the work in the future than when they had done the same work in the past (9.25 vs. 8.59 € per hour). This difference was also not significant  $F(1,140) = 1.5, p = .223$ . Figure 3 shows the results for both, the computer and newspapers distribution jobs at the males and females group in the past and future.

As evident in Figure 4, a univariate analysis of variance showed that participants believed they deserved 89 cents more for the computer job when they imagined their job in the future than when they imagined the same job in the past (9.61 vs. 8.72 € per hour) and this difference was significant  $F(1,298) = 5.76, p = .017$ . In addition, we found that participants believed they deserved 46 cents more for the newspapers distribution job when the work would be imagined in the future than when the same work had been imagined in the past (8.43 vs. 7.97€ per hour) and this difference was also significant  $F(1,298) = 4.74, p = .030$ .

Our results support the Temporal Value Asymmetry theory. Thus, the current results are in line with earlier findings, which show the same events rated higher, monetarily, in the future than in the past (Caruso et al., 2008).



**Figure 4:** Amount of money (in Euro) received for jobs in the future and for jobs in the past. The experimental conditions were computer data input and newspapers distribution four weeks ago or four weeks in the future.

The results obtained in this study indicate that participants thought they should receive more money for doing the jobs in the future than for doing it in the past. The present results revealed the classic temporal value asymmetry effect for entering data into a computer job and a newspapers distributing job. There is no effect for the Type of work on the Temporal Value Asymmetry. Specifically, the future monetary value of the computer and newspaper distribution jobs was more valuable than the value of past jobs. Moreover, the findings revealed a considerable difference between both task types. More specifically, the computer job had a higher value in the past and future than that of newspaper distribution.



Participants' gender did not influence in Temporal Value Asymmetry theory: in the future condition both the men and the women valued the computer job and newspapers distributing job more than the same job in the past condition. Study 1a has concluded that Temporal Value Asymmetry theory has a stronger effect on men than on women. Males hoped to get more money for doing the same job than females in the both past and future.

### **2.1.2. Study 1 B: The Job Preference and Temporal Value Asymmetry Theory**

As mentioned previously, we were interested in examining the effect of emotions on the temporal value asymmetry notion through investigating the effect of the job preference on temporal value of this action. In this point, we sought to explore the relationship between job preference and the monetary value of this job according to the time of occurrence. We investigated this topic in Study 1b. In the present study we asked participants, which one of the two jobs they consider the most acceptable job, entering data into a computer or newspaper distribution Job. If emotional reactions mediate the temporal value asymmetry, then the temporal value of events should be stronger when people evaluate the most preferred job than when they evaluate the non- or less preferred job.

#### **2.1.2.1. Method**

##### Subjects

The same participants in Study 1a participated in Study 1b. 197 people chose the computer job as the most acceptable. On the other hand, the people who choose the distributing of newspapers job as the most acceptable job were 103 Persons.

### Design

This study used a 2 (Time: Past vs. Future) × 2 (Task: newspaper distribution job vs. computer job) × 2 (the Preferred Job: newspaper distribution job vs. computer job) design. The amount of hourly payment which participants thought they should receive was measured as the dependent variable.

### Procedure

In Study 1a, we will seek to investigate the effect of the Job preference on the Temporal Value Asymmetry theory. We mean by job preference, the job which is found to be more acceptable to the participants. The people in Study 1b evaluate the monetary value of the computer job and of the newspaper distribution job, either in the past or in the future, and then choose which job is more acceptable (more preferred). If the person selects newspaper distribution job as the most acceptable job, we consider the newspaper distribution job to be the 'preferred' job for this person, while the computer job is considered 'non-preferred'. In the opposite case the reverse will be assumed; the computer job is 'preferred' and the distribution job is 'non-preferred'. This means when we describe the newspaper distribution or computer job as the preferred job we mean that one of these two jobs is preferred for participant more than the other; in other words the person accepts and wants one job more than the other.

Based on the results of the job selection item (which job the participants considered as the most acceptable), we have divided the data into four preference groups. This allows us to study each group separately. We can in this case make a comparison between the monetary and personal preference values of these jobs in the past and future. The purpose of this procedure is to study the temporal value of the four following groups:

- 1- Computer job as the most acceptable: the value of computer job for the people who consider the computer job to be the most acceptable.
- 2- Computer job as the least acceptable: the value of computer job for the people who consider the newspaper distribution job to be the most acceptable.
- 3- Newspaper distribution job as the most acceptable: the value of newspaper distribution job for the people who consider the newspaper distribution job to be the most acceptable job.
- 4- Newspaper distribution job as the less acceptable: the value of newspaper distribution job for the people who consider the computer job to be the most acceptable.

The intent of this investigation is to answer some of the questions:

- Is the future monetary value of the preferred job higher than that of the past value? Within this question there are two sub-questions:
  - 1- Is the monetary value of the computer job (when it's the preferred job / the most acceptable job) in future higher than its value in the past?
  - 2- Is the monetary value of the newspaper distribution job (when it's the preferred job) higher in future than its value in the past?
- Will the future superiority on the past monetary value still exist when this job is non- preferred? Here also there are two sub-questions:
  - 1- Is the monetary value of the computer job in future (when it's the non- preferred job / the least acceptable job) higher than its value in the past?
  - 2- Is the monetary value of the newspaper distribution job in future (when it's the non- preferred job) higher than in the past?

In this study, we sought also to examine the relationship between job preference and the monetary value of this job regardless of the time of occurrence. In other words we ask the following questions:

- 1- Will any change of the job value to take place according to job preference, and is the monetary value of same job going to be different when it is the preferred job or not? Here we study the differences between the value of the job when it's the preferred (computer job or newspaper distribution job) and the value of the same job when it's the non- preferred.
- 2- Will people give more monetary value of the job when it is the most preferred job compared with the other job when it is non- or less preferred? Here we study the differences between the value of the preferred job and the value of the other job (the non-preferred job). This means that we compare between the value of computer job when it' is the preferred job and the value of the newspaper distribution -job when it is the non- preferred job as well as the difference between the value of the newspaper distribution - job when it is the preferred job and the value of computer job when it is the non-preferred job.

### 2.1.2.2. Results and Discussion

An analysis of variance (ANOVA) with the within-subject factors Job (newspaper vs. computer) and the two between-subject factors the Preferred Job (newspaper distribution job vs. computer job) and Time (past vs. future) was performed on the dependent variable amount of required money. Figure 5 shows the mean of this dependent variable as a function of time, job, and the preferred job. The ANOVA results are summarized in Table 2.

There was significant main effect of the Preferred Job,  $F(1,296) = 4.86$ ,  $p = .028$ ; participants awarded more monetary value of job when this job is

preferred than when it is non-preferred (9.10 vs. 8.26 €). There was an almost significant main effect Time,  $F(1,296) = 3.80$ ,  $p = .052$ . Participants asked for more money when they imagined the job in the future rather than when they imagined it in the past (9.02 vs. 8.35 €). As in Study 1a, factor Job yielded a highly significant main effect,  $F(1,296) = 20.59$ ,  $p < .001$ . The main effect of Time, however, was neither significantly modulated by the Preferred Job,  $F(1,296) = 2.88$ ,  $p = .091$ , nor by Job,  $F(1,296) = 0.52$ ,  $p = .471$ . However, the interaction between the Preferred Job and Job was significant  $F(1,296) = 11.99$ ,  $p = .001$ . Finally, the interaction of all three factors was not significant,  $F(1,296) = 2.01$ ,  $p = .152$ .

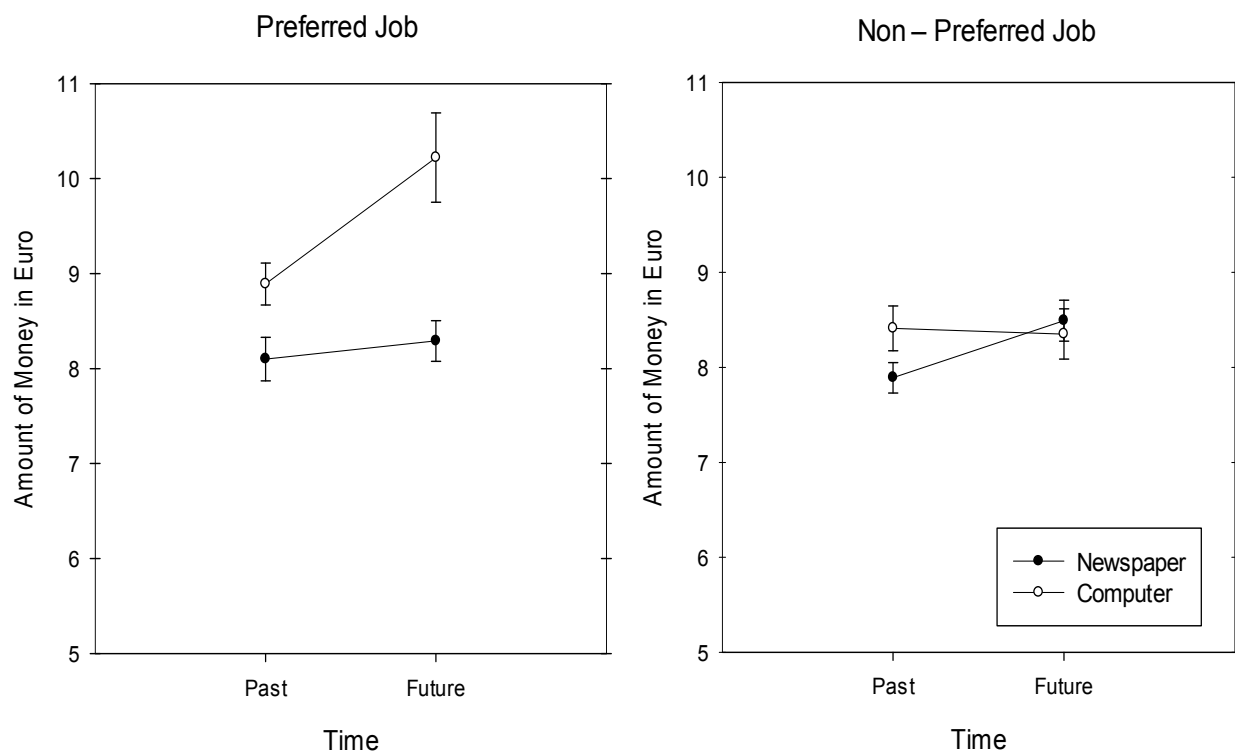
As expected, a univariate analysis of variance revealed that there is a significant difference between the monetary value of the computer job in future ( $N = 101$ ,  $M = 10.22$ ,  $SE = 4.73$ ) and the monetary value of the computer job in past ( $N = 96$ ,  $M = 8.89$ ,  $SE = 2.07$ ) "when the computer job is preferred",  $F(1,195) = 6.41$ ,  $p = .012$ . The future value was more than the past value. When the newspaper distribution job is the preferred job we find no significant difference between the monetary value of the newspaper distribution job in future ( $N = 49$ ,  $M = 8.29$ ,  $SE = 1.49$ ) and the monetary value of the newspaper distribution job in past ( $N = 54$ ,  $M = 8.11$ ,  $SE = 1.67$ ),  $F(1,101) = .36$ ,  $p = .551$ . The future newspaper task given a higher more value than the past newspaper task.

Most importantly, when the computer job is considered to be the non-preferred job, i.e. the newspaper distribution job is the most acceptable job, we find no significant difference between the monetary value of the computer job in the future ( $N = 49$ ,  $M = 8.36$ ,  $SE = 1.85$ ) and the monetary value of the computer job in the past ( $N = 54$ ,  $M = 8.41$ ,  $SE = 1.74$ ,  $F(1,101) = .02$ ,  $p = .875$ ). The computer job in the future was given a lower rating than the same job in the past. When the newspaper distribution job is the non-preferred job, i.e. the computer job is the most acceptable job, we find a significant difference

between the monetary value of the newspaper distribution job in the future ( $N = 101$ ,  $M = 8.49$ ,  $SE = 2.17$ ) and the monetary value of the newspaper distribution job in the past ( $N = 96$ ,  $M = 7.89$ ,  $SE = 1.58$ ),  $F(1,195) = 4.75$ ,  $p = .031$ . The future value was also more than the past value.

**Table 2**  
Analysis of Variance of Study 1b.

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
The Preferred Job	45.718	1	45.718	4.858	.028
Time	35.729	1	35.729	3.797	.052
The Preferred Job x Time	27.107	1	27.107	2.881	.091
Error (The Preferred Job, Time)	2785.411	296	9.410		
Job	80.886	1	80.886	20.592	.000
The Preferred Job x Job	47.095	1	47.095	11.990	.001
Time x Job	2.043	1	2.043	0.520	.471
The Preferred Job x Time x Job	8.116	1	8.116	2.006	.152
Error (Job)	1162.689	296	3.928		



**Figure 5:** Results of Study 1b. Amount of required money (€) as a function of time and job. Left panel depicts the results for the preferred job and the right panel for the non-preferred job. The error bars show the standard error of mean, that is, Mean  $\pm$ 1 SE.

The average monetary value of the computer job is 9.17 Euro per hour. This value is the overall mean of the computer job regardless if this job is preferred one or not. Results indicate that the computer job value increases when it's the preferred job ( $N = 197$ ,  $M = 9.57$  Euro per hour) and decreases when it's non-preferred ( $N = 103$ ,  $M = 8.39$  Euro per hour), we found a significant difference in monetary value between both groups  $F(1,298) = 9.28$ ,  $p = .003$ . At the same time, we found that the average of the monetary value of newspaper distribution job was not affected by job preference. The overall mean of newspaper distribution job is 8.20 Euro per hour. This value does not change whether the newspaper distribution job was the preferred ( $N =$

103,  $M = 8.20$ ), or non -preferred job ( $N = 197$ ,  $M = 8.20$ ), we noted no significant difference between both groups  $F(1,298) = .0$ ,  $p > .988$ .

In view of the results, we noted that, regardless of job preference/acceptability, the value of the computer job is always higher than the value of the newspaper distribution job. The results show that the group who selected the computer job as the most acceptable job agree that the computer job deserves more money than newspaper distribution job (computer job = 9.57 €, newspaper distribution job = 8.20 €). On the other side, the results show that the participants who selected the newspaper distribution job as the most acceptable job also agree that the computer job deserves more money than newspaper distribution job (computer job = 8.39 €, newspaper distribution job = 8.20 €).

Finally, results indicate that 147 Students placed more monetary value on the most acceptable job than on the other, less acceptable job. 88 students gave same value for both, the most and the least acceptable jobs, but only 65 students awarded the least acceptable job more monetary value.

Our results partly support the Temporal Value Asymmetry theory. Thus, the current results show that job acceptance modifies the Temporal Value Asymmetry effect for computer job but had no effect on newspaper distribution job. More specifically, we found that the financial value of computer job in future was more valuable than the same job in the past, and that there is a big difference between the computer job value in future and its past value when it's the most acceptable job for the participants. On the other hand the above -mentioned situation is entirely different when the computer job becomes the least acceptable job than the other job. The monetary value of computer job in past will be , in this case, more valuable than the monetary value of computer job in future and this indicates that non preference of the job has the ability to create the reverse effect on the Temporal Value Asymmetry hypothesis i.e. that the past value is higher than



its future value. With regard to for the newspaper distribution job, we found, that in both cases when this job is the most or less acceptable, the future value will remain superior to the past value.

The monetary value of newspaper distribution job does not change according to whether the newspaper distribution job was the most or less acceptable job. This means that amount of money for newspaper distribution job has not been affected by the job preference. This may be the reason that job preference has therefore not been able to influence the Temporal Value Asymmetry hypothesis for newspaper distribution job. In contrast, the monetary value of computer job will increase more when it's the most acceptable job and will decrease when it's the least acceptable job and this may be the reason that job preference has the ability to influence the Temporal Value Asymmetry hypothesis for computer job. At the end, we find that when the job preference can influence change in monetary value of the job, it can and will influence Temporal Value Asymmetry hypothesis. Alternately, when the job preference cannot influence and change monetary value of the work, in this case the job preference cannot influence Temporal Value Asymmetry hypothesis.

The current study indicated that when people prefer one job more than another job, they give the more acceptable job a superior value in comparison to that which they don't prefer or find least acceptable job. When people prefer the job it means that they have strong desire to do this job and that will lead likely to strong emotional responses for the preferred job, therefore the preferred event becomes more attractive and valuable. For example a person may have a tendency to pay more money when he/she buys something he likes, in comparison to something he/she doesn't like. Although it may be that the less preferred object has physical properties better than the more preferred object for the person, the emotional characteristics of the preferred object and its psychological effect on the person who wants to buy

it may make the preferred thing more valuable in comparison to the non-preferred thing.

The value of the job will increase more if this job was preferred for people, however, the amount of this increase will differ according to job type where this increase will be more when it's a computer job than it's a newspaper distribution job. The number of people who select the newspaper distribution job as the most acceptable job is much less than the number for those who select the computer job as the most acceptable job, therefore the newspaper distribution job in general can be considered in our research as the less preferred job and this may have an effect on the results concerning the superiority of the future value on the past value for the computer job. This was more powerful than the superiority of the future value on the past value that we found in the newspaper distribution job.

## 2.2. Study 2

The results of Study 1a supported the Temporal Value Asymmetry hypothesis. Specifically, Germans showed a classic temporal value asymmetry effect and they have given the future job more value than the similar past job. We intend to redo the study in other country and culture, and compare the results those obtained in Study 1a in order to investigate whether there are cultural differences in temporal value asymmetry.

Guo (2008) found that Canadians showed a classic temporal value asymmetry effect. Specifically, Canadians attached more monetary value to an event in the future than to an identical event in the past with similar temporal distance whereas Chinese placed more monetary value on a past event than on an identical future event i.e. Chinese showed a reversed inverted temporal value asymmetry effect. To compare between people from

Syria, and people from Germany concerning to temporal value asymmetry theory, Study 2 was conducted.

The second study seeks to understand whether Syrians, like Germans will show a classic temporal value asymmetry effect (the monetary value of the job in the future will be more than it was in the past), or they will appear in contrast to the German group a reverse effect on the temporal value asymmetry (the monetary value of the job in the past will be more than it was in the future). Will Syrians show no temporal value asymmetry effect (no difference between the monetary value of the job in the future and in the past). In addition, we also investigated the effect of the type job (``entering data into a computer`` and ``newspapers distributing ``), and gender differences in the temporal value asymmetry.

## 2.2.1. Study 2: Syria Group

### 2.2.1.1. Method

#### Subjects

Participants were 300 students (197 men, *Mean age* = 22.6 years), (103 women, *Mean age* = 21.1 years) from Aleppo University. There were 150 Participants in Past Group (103 males and 47 females) and one hundred fifty participants in Future Group (94 males and 56 females).

#### Design

The design of Study 2 was the same as in Study 1a, Study 2 used a 2 (Time: Past vs. Future)  $\times$  2 (Task: newspaper distribution vs. computer data input)  $\times$  2 (Gender: men vs. women) design. As in Study 1a, the amount of hourly wage participants thought they should receive was measured as the dependent variable.

## Procedure

Similar procedures as in Study 1a were used in the Study 2. Three hundred Participants from an Aleppo University in Syria read a version of the narrative that it was used in Study 1. As in Study 1, the questions involved doing four hours of data input every day and four hours every day distributing of newspapers 4 weeks in the past or 4 weeks in the future. Syrian Participants indicated the amount of money in Syrian lira that they should receive for each hour of work. The original questionnaire, which was applied in Study 1 in Germany, was in German language. In Study 2, we translated the German questionnaire into Arabic and applied this new questionnaire on the Syrian group. The monetary value of the Arabic questionnaire was in Syrian lira.

### **2.2.1.2. Results and Discussion**

As in study 1a, Data was analyzed using analysis of variance for repeated measures (ANOVA) with the within-subject factors Job (newspaper vs. computer) and the two between-subject factors Gender (female vs. male) and Time (past vs. future) was performed on the dependent variable amount of required money. Figure 6 shows the mean of this dependent variable as a function of time, job, and gender. The ANOVA results are summarized in Table 3.

There was significant main effect of Gender,  $F(1,296) = 15.27, p < .001$ ; female participants tended to ask for more money than male participants (144.06 vs. 127.04 Syrian lira). Most importantly, there was significant main effect of Time,  $F(1,296) = 5.39, p = .021$ ; consistent with the temporal value asymmetry. As in Germany study, Syrian participants asked for more payment when they considered that the work was in the future rather than it had been in the past (200.87 vs. 157.28 Syrian lira). Furthermore, the main effects of Job

was significant,  $F(1,296) = 6.75$ ,  $p = .010$ ; participants generally required more money for performing entering data in a computer than for delivering newspapers (187.72 vs. 170.35 Syrian lira). The main effect of Time, however, was neither significantly modulated by Gender,  $F(1,296) = 0.21$ ,  $p = .641$ , nor by Job,  $F(1,296) = 0.03$ ,  $p = .864$ . Finally, neither the two-way interaction of Gender and Job,  $F(1,296) = 0.01$ ,  $p = .939$ , nor the interaction of all three factors,  $F(1,296) = 0.48$ ,  $p = .491$ , approached statistical significance.

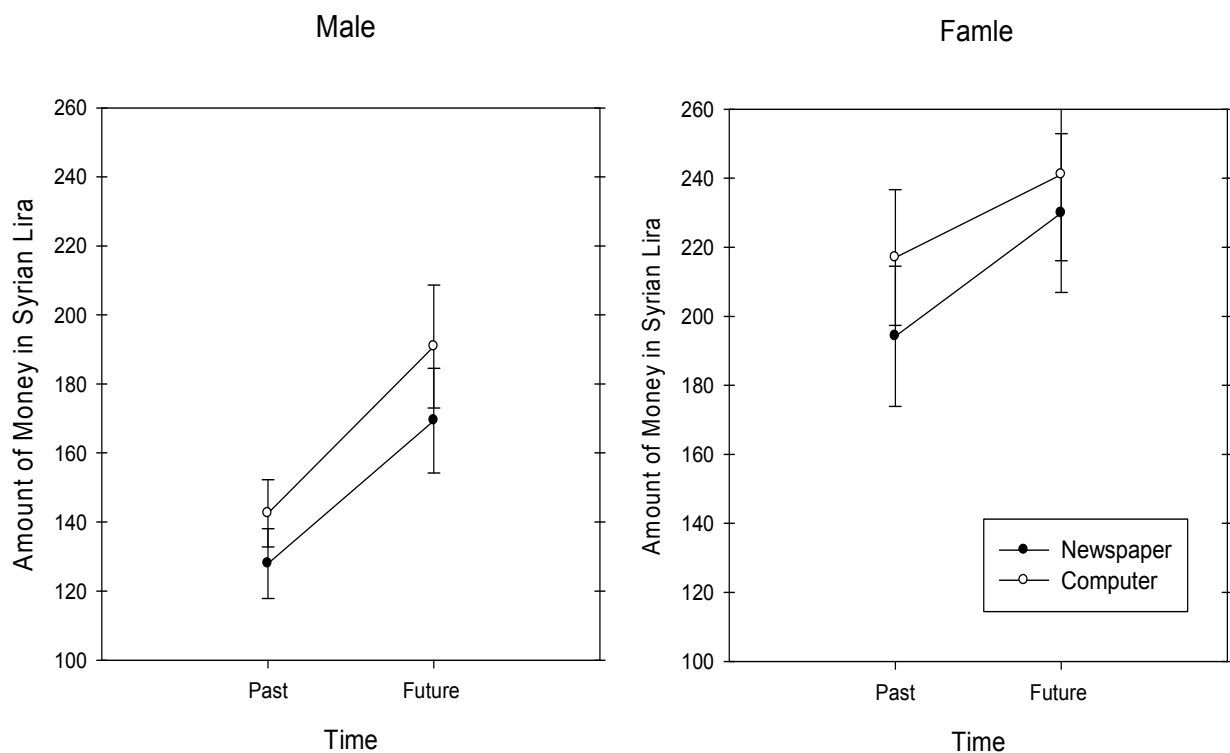
**Table 3**

Analysis of Variance of Study 2.

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Gender	532164.633	1	532164.633	15.269	.000
Time	187831.237	1	187831.237	5.389	.021
Gender x Time	7600.981	1	7600.981	0.218	.641
Error (Gender, Time)	10316622.737	296	34853.455		
Job	41108.143	1	41108.143	6.746	.010
Gender x Job	36.272	1	36.272	0.006	.939
Time x Job	180.235	1	180.235	0.030	.864
Gender x Time x Job	2901.929	1	2901.929	0.476	.491
Error (Job)	1803678.598	296	6093.509		

A univariate analysis of variance revealed showed that Syrian males asked for more money of Computer job when they would do the job in the future than when they had done the same job in the past (190.85 vs. 142.48

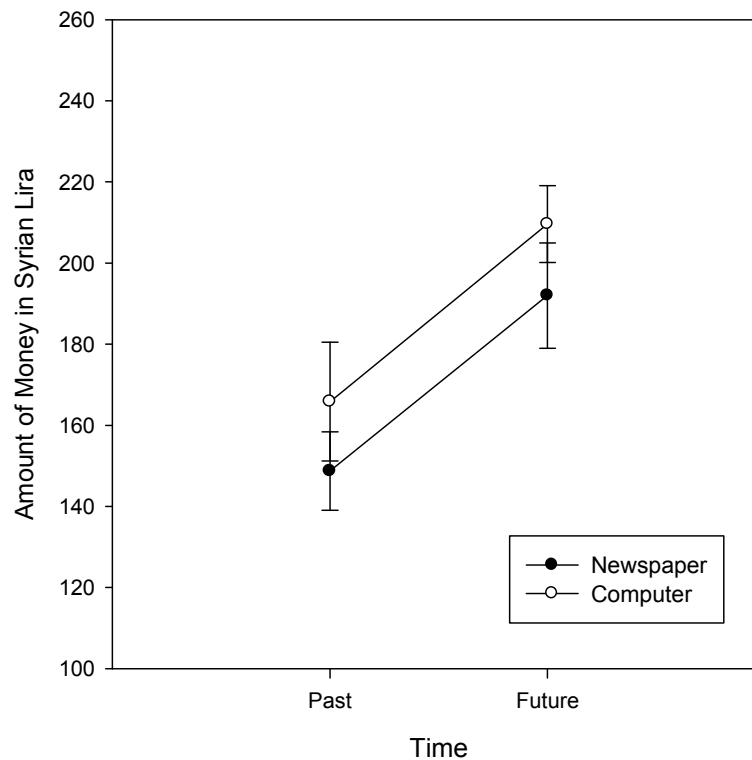
Syrian lira) and this difference was significant  $F(1,195) = 5.97, p = .015$ . Furthermore the male participants awarded more money of the newspapers distributing job when they considered that the work has to be done in the future rather than was performed in the past (169.36 vs. 127.96 Syrian lira) and this difference was also significant  $F(1,195) = 5.32, p = .022$ .



**Figure 6:** Results of Study 1a. Amount of required money (Syrian lira) as a function of time and job. Left panel depicts the results for males and the right panel for females. The error bars show the standard error of mean, that is,  $\text{Mean} \pm 1 \text{ SE}$ .

We found that Syrian females, like the Syrian males, required more money for performing entering data in a computer when they imagined this work in the future than when they imagined it in the past (241.07 vs. 217.02

Syrian lira) and this difference between values of both time groups was however not significant  $F(1,101) = 0.05, p = .463$ . Furthermore female participants gave more monetary value of the newspapers distributing job when they considered that the work has to be done in the future rather than was performed in the past (229.91 vs. 194.26 Syrian lira). This difference was also not significant  $F(1,101) = 1.30, p = .257$ .



**Figure 7:** Amount of money (Syrian lira) received for jobs in the future and for jobs in the past. The experimental conditions were computer data input and newspapers distribution four weeks ago or four weeks in the future.

As can be seen in Figure 7, the data show that people believed they deserved 43.77 Syrian lira more money for the computer job when this work would be imagined in the future than when the same work had been imagined in the past (209.60 vs. 165.83 Syrian lira) and a univariate analysis of variance revealed that this difference was significant  $F(1,298) = 6.32, p = .012$ . In addition, we found that Participants believed they deserved 43.24 Syrian lira more money for the newspapers distribution job when they would do the work in the future than when they had done the same work in the past (191.97 vs. 148.73 Syrian lira) and this difference was also significant  $F(1,298) = 7.11, p = .008$ .

The results of Study 2 supported Temporal Value Asymmetry theory. Syrians people showed the classic temporal value asymmetry effect, the future jobs are rated as being valuable than same jobs in the past that have similar temporal distances to the present time. We found temporal value asymmetry effect for the computer job and the newspaper distribution job. More specifically, the future monetary value of the Computer job and of the newspaper distribution job was more valuable than the same job in the past. Participants' gender did not influence in Temporal Value Asymmetry theory: men and women both believed they deserved more money for their future job than for their past job.

### 2.2.2. Cultural Differences in Temporal Value Asymmetry

In Study 2, participants indicated the amount of money in Syrian lira that they should receive for each hour of work. Participants in Study 1 indicated the amount of money in Euro, and this difference in the monetary value; we converted the monetary value for both studies (1 and 2) within each study from raw scores into z-scores.



Z- Scores provides a way to standardize or equate different metrics. This conversion put the monetary value from different values into the same metric system. We can now interpret Participants scores in Study 1 and Study 2 on the same metric (the z-score metric). Each score comes from a distribution with the same mean (0) and the same standard deviation (1), but we have positive and negative numbers (Z is negative when the raw score is below the mean, positive when above). We added 50 points to the whole data values to avoid minus signs. If we add a constant to values, the mean will change by the same amount as the constant. The standard deviation will remain unchanged. We are just shifting the distribution up or down the scale and the relationship between values is not affected.

**Table 4**

Cultural differences in the amount of money for newspapers distributing job and computer job:

Country				
Job	Germany	Syria	<i>t</i>	<i>p</i>
Computer				
Past	49.86	49.85	-0.080	.963
Future	50.13	50.14	0.045	.964
Newspapers				
Past	49.87	49.84	-0.274	.784
Future	50.12	50.15	0.215	.830

Z- Scores + 50, *t* -score for past-future computer job and past-future newspaper distribution job in the German and the Syrian group.

The purpose of this statistical procedure is to directly compare between the Syrian and German group concerning the temporal value asymmetry. For example the computer job in the Syrian group was more with 43 Syrian pounds (29%) in the future than the same job in the past. The German group had 89 cent (10%) difference in the future than the same job in the past. If we want to compare here between both groups, then the result will indicate that in the Syrian group the future is better than the past to a larger degree than for the German group, but as can be seen in Table 4 the modified scores (z-score + 50) show that there was no difference between the German group and the Syrian group for computer job in the both future and past.

**Table 5**

Sex differences in the amount of money for newspapers distributing job and computer job: Z-score + 50, *t* -score for newspaper distribution job and computer job in the German and the Syrian group.

Job	Country		<i>t</i>	<i>p</i>
	Germany	Syria		
Computer				
Females	49.93	50.28	2.628	.009
Males	50.06	49.85	-2.031	.043
Newspapers				
Females	49.79	50.31	4.092	.000
Males	50.18	49.84	-3.190	.002

The cultural differences did not influence in Temporal Value Asymmetry theory: The results of Study 2 are compatible with the results of

Study 1 and agree with the Temporal Value Asymmetry hypothesis, both Syrian and German groups showed that the future job value is higher than that of the past.

As can be seen in Table 4 , the modified scores showed that there was no difference between the two groups (German, Syrian) for the computer job in the past  $t(298) = -0.080, p = .963$ , or in the future  $t(298) = 0.045, p = .964$ . In addition, neither the differences between German group and Syrian group for the newspaper distribution job in the past,  $t(298) = -0.274, p = .784$ , nor in the future,  $t(298) = 0.215, p = .830$ , approached statistical significance. However, Z- scores showed that the difference between the past and future value for newspaper distribution job was higher for the Syrian group than the difference between the past and the future value for newspaper distribution job was for the German group. This means that the future priority (the future being better than the past) for the newspaper distribution job was more in the Syrian group.

The results of the Study 1 showed that German males, compared with German females, tended to give more monetary value to both, the computer and newspaper distributing jobs. On the contrary to the results of the German study, the results of the Study 2 showed that for both tasks computer and newspapers distributing job, compared with Syrian males, Syrian females tended to give more monetary value money.

In comparison between both studies, the results revealed that German males evaluated the monetary value of computer job,  $t(353) = -2.031, p = .043$ , and newspapers distributing job,  $t(353) = -3.190, p = .002$ , more highly than Syrian males did. As can be seen in Table 5, the results indicate that Syrian females evaluated the monetary value of computer job,  $t(243) = 2.628, p = .009$ , and newspapers distributing job,  $t(243) = 4.092, p < .001$ , to be more valuable than the German females' evaluation. The females in Germany, as well as the males in Syria, may think about emotional events in a less extreme

fashion compared with the males in Germany and the females in Syria. In other words, German males and Syrian females would experience more intense reactions to events compared with the other gender in both countries.

**Table 6**

Analysis of Variance of German study and Syrian study. Z- Scores + 50 for past-future computer job and past-future newspaper distribution job in the German and the Syrian group.

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Gender	1.077	1	1.077	0.688	.407
Time	19.088	1	19.088	12.186	.001
Time x Gender	2.932	1	2.932	1.872	.172
Country	0.021	1	0.021	0.013	.909
Country x Time	0.004	1	0.004	0.002	.962
Error	930.418	594	1.566		
Job	0.020	1	0.020	0.051	.822
Job x Gender	0.845	1	0.845	2.117	.146
Job x Time	0.005	1	0.005	0.012	.912
Job x Time x Gender	0.230	1	0.230	0.577	.448
Job x Country	0.014	1	0.014	0.036	.849
Job x Country x Time	0.014	1	0.014	0.036	.849
Error (Job)	237.035	594	0.399		

### 2.3. Study 3

Study 3 was specifically designed to investigate whether the temporal value asymmetry effect would emerge when participants valued an impersonal value event. Unlike the earlier studies this study focuses on impersonal event values, which means that the values of the events (i.e. the amount of money for the work) deserved for other people. In Study 3, participants imagined that they as an employer should pay some money to the employees and that another person would do the computer job four weeks later (future group) or had done the computer job four weeks earlier (past group). Participants in Study 3 reported the amount of money (Euro) the other person should receive for each hour of the job.

Studies 1 and 2 were designed to examine if the temporal value asymmetry effect will occur when the participants evaluate an event as a personal value. The Studies 1 and 2 value event used a Personal value condition which means that the values of the events (i.e. the amount of money for the work) correlated directly to the individual. In both of the first two studies, the person imagined himself as a worker earning money from employer and that he/she will do or has done the job in the coming (future group) or previous four weeks work (past group). The results of the Study 1 and 2 supported Temporal Value Asymmetry effect. Specifically, people have given their future job more money than the similar job in the past.

The difference between the Studies (1&2) and (3) is that participants in the Study 3 evaluated impersonal value events; while in the another two studies (1&2) they evaluated personal value events:

- The personal value: which we studied in Study 1&2 is that the person imagines himself as an employee and will perform a defined job. He specifies the proper payment which he should earn for the performance of this job.

- The impersonal value: As in Study 3 the person who imagines himself an employer should give the employee the payment he deserves.

Caruso et al. (2008, Study 4) investigated whether affective reactions to the evaluation of past and future events mediate the temporal value asymmetry effect. In their studies, some participants imagined that they would do the computer job one month in the future or had done the computer job one month in the past (self-relevant condition), while others groups imagined (self-irrelevant condition) that a randomly selected person from the local area would do the computer job one month in the future or had done the computer job one month in the past. Participants indicated the amount of payment that they or the other person should receive for doing the job. Caruso et al. found that a larger temporal value asymmetry effect occurs when people contemplate a self-relevant event than when they contemplate a self-irrelevant event. More specifically, People assumed they merited more money for their future job than for their past job, but that another person merited the same amount of money for her future and past job. Kantan and Teigen (2008) report that people think that they are better than others. Furthermore, Participants believe they will improve more than most others in the future. In addition, people tend to believe that they are less likely than others to experience negative life events in the future (Weinstein, 1980).

The goal of the present study to investigated whether participants in the impersonal value condition will show a classic temporal value asymmetry effect; i.e. the participants in the future job condition owed the other person more money compared to the past job condition, or whether they will display no temporal value asymmetry effect (no difference between the monetary value of the job in the future and the past). We found in the Studies 1 and 2 that the temporal value asymmetry effect emerged when participants valued a personal value event. In Study 3 we will investigate whether there is similar influence on the temporal value asymmetry in the impersonal value

condition, as we have seen in the personal value condition. Furthermore, is it possible that people give others more money in future, compared with the past, than they gave for themselves?

### 2.3.1. Method

#### Subjects and Design

Participants were 200 students, from Tuebingen University. They were 98 men (*Mean age* = 25.2 years) and 102 women (*Mean age* = 23.7 years). The time of the job was measured as an independent variable. The amount of hourly payment, which participants thought the other person should receive, was measured as the dependent variable.

#### Procedure

200 students were randomly assigned to one of the two conditions, 100 subjects per condition:

- The past condition: the Participants imagined that they wanted to employ someone and this person had done the computer job every day in the last four weeks.
- The future condition: the Participants imagined that they would like to employ someone and this person would do the computer job every day in the next four weeks.

We asked Participants to specify the payment in Euro they would like to give to the other person for each hour work of the computer job. We used in our research a story which is similar to the question of the work used in Caruso et al study (2008, Study 4). Caruso used two conditions in his study (self-relevant condition and self-irrelevant condition) while in Study 3 we used

one condition (impersonal value condition). This was because the self-relevant condition used in Caruso study was similar to the condition that we used in Studies 1 and 2 where the person who is going to do the job will receive the payment for this job.

The difference between the impersonal value (Study 3) and self-irrelevant condition (Caruso study) was that in self-irrelevant condition the person should be completely neutral because another person will do the job and the participant is not the one who will pay the payment to the other person, while in impersonal value condition the participant is not completely neutral and even it's true that he will not do the job, but he will pay the money to the other person.

### 2.3.2. Results and Discussion

The univariate analysis of variance revealed that there is no significant difference between past- computer Task and future- computer Task (8.81 vs. 8.88€),  $t(198) = 0.261$ ,  $p = .794$ . As in the Caruso study (2008, Study 4), our results didn't support the Temporal Value Asymmetry hypothesis. Specifically, there is no difference between the future value for computer job and the past value for the same work, when the participants imagined that the other person would do the computer job four weeks later or had done the computer job four weeks previous. This result indicates that emotional reactions mediate the temporal value asymmetry because the temporal value of events was stronger when people evaluated a personal value event (the values of the events correlated directly to the person who evaluates the event) than when they evaluated an impersonal value event (the values of the events earned by other people and not the person who evaluates the event).

It is possible that people attribute more value to events in future compared with those in the past when the value of the events belong to them



(i.e. they benefit from the value). People expect the best for themselves in future regardless whether the past is bad or good, so if it was bad, then the future will be an opportunity to improve that unwanted past and if it's good, then people will want more improvements of their future lives. In addition to seeing themselves as better than most others, people believe they have improved more than most others, and will improve even more in the future (Kantén & Teigen, 2008). Furthermore, people tend to believe that they are less likely than others to experience negative life events in the future (Weinstein, 1980). When people compare themselves to others, they often rate themselves as above average on positive traits like intelligence, friendliness. Nelson and Beggan (2004) found that faced with the prospect of winning a large amount of money, people expected more positive changes for themselves than they did for another, hypothetical person.

### 3. SUMMARY AND GENERAL CONCLUSION

The evaluation of events is one of the most complex mechanisms of human thinking. This is due to the various factors which intervene in the process of thinking. This entire process is affected by temporal, personal and environmental variables. We can organise the factors affecting the evaluation of events into three major groups of variables:

- Internal and personal factors such as motivation, emotions, age, and gender, associated with the person who evaluates the events. Different people will frequently disagree about value of the same thing.
- External factors that can be divided into two parts: (a) factors of the environment in which the evaluation of events is made (such factors are not a direct part of the evaluation process itself, but reflect rather the cultural and social influence); (b) factors associated with the nature of the events (such as the type and importance of event). There are material values which pertain to real things like gold or business assets, and there are moral values – those which pertain to ideals such as freedom or dignity. Values of these objects (material or moral) may differ from place to place. Although the ideal of freedom may be generally held to be important, the value of freedom and understanding of what this idea means will differ from country to country. For instance, in some societies, personal freedom does not infringe on the freedom of others, but in other societies the personal freedom refers to chaos and non-compliance with laws. In addition, people in some cultures place more value on moral objects than material objects, while in other cultures the situation is reversed.
- Temporal factors: Events are composed of three distinct time periods: before, during and after. The event's location in time is one of a number of factors which determine how a person will evaluate the events that

may take place in the course of his life. The value of objects can to change over time. The price of gold tends to increase in times of economic crises, and the value of democracy increases during revolutionary periods. For example, in Egypt the ratio increased of Google searches for the word democracy in 2011 by 63 % in comparison to one year ago, and 100 % more than that in 2009 and 2008. This ratio began to decline after the fall of Mubarak in February 2011 to 82% in July 2011 less than it was four months ago.

The purpose of this study is to examine the Temporal Value Asymmetry hypothesis. According to this hypothesis, the value of future events is more valuable in comparison with the events in the past with an equal temporal distance. Previous work have provided strong evidence for the validity of the Temporal Value Asymmetry hypothesis. For example, Caruso et al. (2008) found that the value of computer data entry job was higher in the future condition vs. the past condition. Among the three studies, we had a made simple comparisons between the amount of money participants attached to work in the future works and the past works. The work story, which was used in our studies, was similar to the job scenario conducted by Caruso et al. (2008). In our study, we have introduced some new variables such as gender, cultural and job preference.

The central question which the present study aimed to answer was, "Is it possible to see that there is a change of the monetary value of the job over the time when we compare the value of the job in the past with the same job in the future (Study 1a and Study 2)? Moreover, we sought to study some internal factors (associated with the person who evaluates the events) and external factors (associated with the events or of the environment in which the evaluation of events is made), that they potentially could affect temporal value asymmetry theory. With regard to internal factors, we tried to investigate the effect of gender on the temporal value asymmetry (Study 1a

and Study 2). Do both men and women value a job in the future more than the same job in the past or there are differences between the genders? In addition we were interested in examining the effect of emotions on the temporal value asymmetry notion through investigating the effect of the job preference on temporal value of this action. In this point, we sought to examine the relationship between job preference and the monetary value of this job according to the time of occurrence (Study 1b).

If emotional reactions mediate the temporal value asymmetry, then the temporal value of events should be stronger when people evaluate a personal event than when they evaluate an impersonal event. We investigated this topic in Study 3. We asked whether the temporal value asymmetry effect would emerge when participants valued an impersonal event or this effect would emerge just when participants valued a personal event. For the external factors, we aim to investigate whether there are cultural differences in temporal value asymmetry (Study 1 vs. 2). Is temporal value asymmetry model specific to Western culture (e.g. Germany) or is it possible to see this effect in the Middle Eastern culture (e.g. Syria)? With regard to these external factors, we used in Study 1, 2, two jobs (Entering data into a computer job, Distributing of newspapers job) to examine whether the type of event influences the temporal value asymmetry. The question here was: Are the future monetary values of the computer and newspaper distribution jobs more valuable than the past monetary value of same jobs or will one of them show a classic temporal value asymmetry effect while the other shows a reverse effect on the temporal value asymmetry (the monetary value of the job in the past will be more than it was in the future).

The results of Study 1 and 2 provided evidence that people value events in the future more than equivalent events in the past. Here we ask the question, "Why the future is viewed as more rosy than the past?" For the answer, in this case, we assume that there are several reasons which may

explain why people tend to attach more value to an event if it would happen in the future than if it had happened in the past.

Some of these reasons relate to the nature of the future or past events, for example, let's consider the following aspects: Knowledge of the past is often more certain than knowledge of the future: The past is fact and the future is fiction. The future is the only reality that we can actually do anything about. The future is made up of possibilities rather than certainties, and this allows us to focus on the positive future possibilities. The future is an open book, whereas the past always stays the same. The future is more uncertain and more changeable than the past. The future is more malleable than the past and the valuations can change the future, but not the past. There is much to be learned about the past, but we cannot change the past. The future is more controllable than the past.

There are some of reasons related directly to the evaluation process itself, which may explain the temporal value asymmetry hypothesis. A major factor that could lead to the temporal value asymmetry effect is Affective Extremity. Emotion plays a significant role in this process. Emotions and affective reactions to the contemplation of past and future events mediate the temporal value asymmetry effect. Emotions associated with a future event tend to be more extreme than emotions associated with an identical past event. The emotions associated with objects and events are often used as a basis for evaluating these objects and events. People may think about emotional events in the past in a less extreme fashion in comparison with their thoughts about emotional events in the future. People show a strong bias towards overestimating the intensity of affective responses to future events. Negative events in the future often turns out to be more benign than expected. Another factor that could lead to the temporal value asymmetry effect is the asymmetric mental simulations. The evaluation of an event is directly affected by the process of mental simulation. People tend to engage

in more extensive mental simulations in anticipation of future events than in retrospection about similar events in the past. People's simulations of future events are more varied than when they simulate past events; they generate more alternatives. People gave more varied itineraries for the future. People may be less likely to mentally simulate past events in as much of a personally involved manner as compared with their mental simulation of future events. The more extensively people mentally simulate an event, the more value they will attach to this object and event.

Finally, there are some of reasons related to natural mechanism of thinking in the past and the future that may indirectly lead people to tend to attach more value to an event that may occur in the future than one that had occurred in the past. The thinking processes needed when recalling past events is less demanding of the imagination than thinking about future events. In addition, thoughts about past events feel more difficult to imagine than thoughts about future events. Thinking about personal events from the past also feels more difficult than thinking about personal events in the future. Positive future outcomes are also more quickly and easily brought to mind than negative ones. People have rosier, optimistic views about their futures compared with the more realistic, mixed views about their pasts. To summarize: thinking about future events is more extensive, more optimistic feels less difficult, more imaginative, and more free from reality constraints than thoughts about past events.

Regarding the effects of gender on the temporal value asymmetry effect, results obtained from first and second study demonstrate that participants' gender did not have an influence: in the future condition both the men and the women valued the computer job and the newspapers distribution job more highly in the future condition than the same job in the past condition. In addition, we observed that male participants (German males & Syrian males) in Studies 1 and 2 reported a stronger Temporal Value Asymmetry in

all of the samples than their female counterparts (German females & Syrian females). The results of the Study 1 showed that German males, in comparison with German females, tended to give more monetary value to both, the computer and newspaper distributing jobs. In contrast to the results of the German study, the results of Study 2- which was made up of Syrian participants - showed that both tasks. Computer and newspapers distributing job, were given more value by females. Our results show that a stronger Temporal Value Asymmetry for German males, compared with German females, has the ability to affect their evaluation of the jobs, i.e. the stronger effect among German males may have led them to expect a greater monetary value to both jobs that compared with German females. On other hand, we found that this strong effect for Syrian males, compared with Syrian females, did not lead to a greater monetary evaluation of the jobs for males than females, but the results show reverse this. The reasons for this find may be that the employment rate of female students in Syria is very low in comparison to their male counterparts. This means that Syrian females do not have much experience with jobs nor with their monetary value. This may make their evaluations less assertive, objective, and realistic than male students in Syria.

In connection with the cultural differences in our subjects, we did not find an influence in Temporal Value Asymmetry theory: The results of Study 1 "German study" are compatible with the results of Study 2 "Syrian study" and agree with the Temporal Value Asymmetry hypothesis; both German and Syrian groups showed that the future job value is higher than that of the past. With regard to this finding, I would like to mention that before conducting our study in Syria, I expected that the results would be contrary to the results of the German study , i.e. the Syrian group would show a reversed temporal value asymmetry effect, so that the value of past event potential would be more valuable than future event. Because the general atmosphere in Syria (e.g. in media, educational institutions . . . ) magnifies the

past so much and is not interested in the future. Since childhood I have always heard that we were a great and advanced civilization in history. But we rarely heard that we will be or will try to be an advanced nation, like other the developed nations, in the future. At first I was not entirely convinced by the results obtained in the Syrian study. I had not expected that Syrian people would demonstrate results remotely similar to what the Germans gave that they would give more value to future events than past ones. Now, after about a year and a half from the implementation of the study, I find that I was mistaken on this point, and the recent events (Syrian Revolution) have demonstrated, on a large scale, the results of the study. Finally, for the differences between Syrian and German study, we noted that although there is a Temporal Value Asymmetry effect for both jobs, there was a different degree this effect for German participants. The German group reported a stronger Temporal Value Asymmetry effect for computer job than with the newspaper distribution job. With regards to the Syrian group, the Temporal Value Asymmetry effect was recorded at very similar degrees for both jobs. It is my belief that this is due to the fact that the opportunities for employment in Syria are few, and that this makes the importance of both jobs identical. The employment opportunities in Germany are greater and the ability to choose is better, and it is for this reason the importance of both jobs may be different.

We found no effect for the type of work on the Temporal Value Asymmetry. The results revealed the classic temporal value asymmetry effect for the 'entering data into a computer job' and a 'newspaper distributing job.' Specifically, the future monetary value of the computer and newspaper distribution jobs was more valuable than the value of past jobs. Moreover, the findings revealed a considerable difference between both task types. Specifically, the computer job had a higher value in the past and future than that of newspaper distribution. The computer job requires more coping with technical development and is more harmonious with students than newspaper



distribution job. This could make students more sympathetic with the computer job than the newspaper job, which in turn may increase the difference in the value of the computer job and newspaper job.

The results of Study 3 showed that the temporal value asymmetry effect would not emerge when participants valued an impersonal event. More specifically, there is no difference between the future value for computer job and the past value for the same work when participants imagine that another person would do this job i.e. the amount of money for the work deserved for other people. Individual's emotional reactions to events that may be useful to them are more extreme than their reactions to events that may be useful to other people. This result indicates that emotional reactions mediate the temporal value asymmetry because the temporal value of events was stronger when people evaluated personal value event (the values of the events correlated directly to the person who evaluates the event) than when they evaluated an impersonal value event (the values of the events earned by other people and not the person who evaluates the event). People believe they will improve more than most others in the future. Furthermore, they tend to believe that they are less likely than others to experience negative life events in the future. When people compare themselves to others they often expected more positive events for themselves than for another person.

In connection with the theme of the effect of emotions on temporal value asymmetry, we investigated the effect of the job preference on the temporal value of the computer job and the newspaper distribution job in the past and in the future. If emotional reactions mediate the temporal value asymmetry, then the temporal value of events should be stronger when people evaluate the most preferred job than when they evaluate the non- or less preferred job. Study 1 indicated that when people prefer one job more than another job, most will give the more acceptable job a superior value in comparison to that which they don't prefer or find least acceptable. When

people prefer the job it means that they have strong desire to do this job and that will likely lead to a stronger emotional response regarding the preferred job. Job preference has the ability to affect the Temporal Value Asymmetry hypothesis for the computer job. We found that the monetary value of computer job in future was more valuable than the same job in the past when it's the most acceptable job for the participants, i.e. when computer job is the preferred job. On the other hand, the above -mentioned situation is entirely different when the computer job becomes the least acceptable job (the non-preferred job) for the participants. The monetary value of the computer job in future will be, in this case, equal to (or a little less) the monetary value of computer job in past, and this indicates that non preference of the job (for computer job) has the ability to modify and delete the Temporal Value Asymmetry effect, and which also indicates that emotional reactions mediate the temporal value asymmetry. With regard to for the newspaper distribution job we found, that in both cases when this job is the most or least acceptable (the preferred job / the non- preferred job), the future value will remain superior to the past value, and indicates Job preference has not the ability to affect the Temporal Value Asymmetry hypothesis for newspaper distribution job. As mentioned earlier, the Temporal Value Asymmetry effect was stronger for the computer job, more than double the Temporal Value Asymmetry for the newspaper distribution job. This means that the newspaper distribution job was less affected by emotional reactions than computer job. This may be due to the reason that non preference of the job does not have the ability to modify and delete the Temporal Value Asymmetry effect for newspaper distribution job.

For better psychological health, the normal person should give future events more value than past events. However, this temporal value should stay in a balanced form. Thus, although the value of the future exceeds that of the past, this does not mean that the past is not important. There is much to be learned from the past to better enable a more positive and well managed

future. We have no control over the past but we can do something about our future. We can learn from our previous experiences to improve our quality of life in the future. By reflecting on the past and anticipating the best in the future, we can shape our behavior in order to satisfy the challenges of daily life. This endows the individual with important abilities that enable him to modify his behavior and to fulfill the challenges of daily life. We can learn from the lessons of the past in order not to make the same mistakes again in the future. Our anticipations for the future should be realistic and achievable. If the value of future events is too great, it can hinder well-being when the pursuit of the goals creates more pressure and anxiety. However, if this value is too much lower than the value of past events, it can lead to feelings of hopelessness, depression and apathy, and depress thinking and imagination. Mental illnesses come in degrees of intensity, with mania and anxiety being the extreme form of hope and positive appraisal that one can achieve in the future, and depression being the extreme form of despair -- a sense of impotence about creating a better future. People should seek to attain a state of balanced temporal value, in which the future events are more valuable than the past events, without an extreme degree of intensity regarding the Temporal Value Asymmetry of events. The finding this balance can serve a major role in creating mental health and bringing happiness to people.

We can make several suggestions for future research on Temporal Value Asymmetry effect. It would be interesting to know if there are other variables such as age, which can affect the Temporal Value Asymmetry hypothesis. Future research may examine how the temporal value asymmetry effect may be different for older people. For example, we may find that older people, in comparison with young people, may show a reversed temporal value asymmetry effect (i.e., the value of past event is more valuable than future event). With regard to compare the value of past events with the value of future events (i.e., Temporal Value Asymmetry effect), there has never been

a direct comparison between healthy persons and mentally ill individuals. This topic can be explored in future studies.

## 4. ABSTRACT

An event's location in time is one of the main factors that determine how a person will evaluate this event. Past research has indicated that people's evaluations of past events and those that are likely to occur in the future are not the same. With identical temporal distance from the present, the subjective value of a future event is greater than the value of a similar event that already happened in the past. This effect is usually referred to as the *temporal value asymmetry hypothesis*. The aim of the present study was to investigate this hypothesis in greater detail. In three field experiments, participants compared the amount of money they would attach to a job in the future or in the past. Consistent with the hypothesis, in all present studies participants asked for more money when they considered that the job was in the future rather than it had been in the past. Moreover, we sought to study some factors that would potentially modulate this effect of temporal value asymmetry. Specifically, we examined whether gender modulates temporal value asymmetry and found no significant gender difference. Furthermore, we conducted a cross-cultural study in Germany and in Syria to examine potential cultural differences in temporal value asymmetry. The results of German study were compatible with the results of Syrian study. In both studies, we varied the type of job (entering data into a computer job vs. distributing of newspapers) to examine whether the type of job modulates the temporal value asymmetry; however, type of job did not affect the size of temporal value asymmetry. Finally, we investigated the effect of emotion on the temporal value asymmetry effect. To study this topic, we assessed the effect of job preference on the temporal value of both the computer job and the newspaper job. We found that the temporal value asymmetry effect was stronger when the computer job was the preferred job, but this effect disappears when the computer job was the non-preferred job. With regard to the newspaper job, job preference did not modulate the effect of temporal

value asymmetry. The result of a final study showed that the temporal value asymmetry effect was stronger when people evaluated a personal value event rather than an impersonal one. This latter outcome showed that emotional reactions mediate the temporal value asymmetry effect.

## 5. ZUSAMMENFASSUNG

Der Ereignisort in der Zeit ist einer der wichtigsten Faktoren, der bestimmt, wie wir Ereignisse in unserem Leben bewerten. Die bisherige Forschung hat gezeigt, dass solche Bewertungen davon abhängen, ob ein Ereignis schon stattgefunden hat oder erst stattfinden wird. Zukünftige Ereignisse haben einen höheren subjektiven Wert als vergangene Ereignisse, wenn beide Ereignisse den gleichen zeitlichen Abstand zur Gegenwart besitzen. Dieser Effekt wird oft als *Temporal Value Asymmetry Hypothese* bezeichnet. In drei Feldexperimenten wurde untersucht, ob Teilnehmer eine höhere Entlohnung für eine Arbeit in der Zukunft als in der Vergangenheit fordern. Ziel dieser Studie war es, die Temporal Value Asymmetry Hypothese detaillierter zu überprüfen. In Übereinstimmung mit dieser Hypothese zeigte sich, dass Personen einen höheren Lohn forderten, wenn sie sich vorstellten, dass es sich hierbei um eine zukünftige anstatt um eine vergangene Tätigkeit handelt. Außerdem wurden Faktoren untersucht, die möglicherweise den Effekt der Temporal Value Asymmetry modulieren. Beispielsweise untersuchten wir, ob dieser Effekt vom Geschlecht der Teilnehmer abhängig ist; es zeigte sich hierbei jedoch kein signifikanter Geschlechtsunterschied. Ebenfalls überprüften wir kulturelle Unterschiede (Deutsche vs. Syrier) und fanden hierbei ebenfalls keinen signifikanten Unterschied. Auch die Art der vorgestellten Arbeit (Eingabe von Daten in einen Computer vs. Zeitungsausteilen) modulierte diesen Effekt nicht signifikant. Schließlich untersuchten wir den Einfluss von Emotionen auf den Temporal-Value-Asymmetry Effekt. Hierbei zeigte sich, dass emotionale Reaktionen diesen Effekt modulieren. Insgesamt zeigt diese Studie, dass der Temporal Value Asymmetry Effekt robust und allgegenwärtig ist.

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