

Running head: OPTIMISTIC BIAS, CONTROL AND THE BELIEF IN A JUST WORLD

THE RELATIONSHIP BETWEEN OPTIMISM AND PERCEIVED CONTROL OF
LIFE EVENTS MODERATED BY THE BELIEF IN A JUST WORLD

Jordana Callisto

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Abstract

There has been an immense amount of research suggesting that individuals tend to have a biased outlook on life. Previous research has demonstrated that people exhibit three positive cognitive ‘illusions’: believing in a just world (BJW), optimism for the future, and the illusion of control. These psychological constructs have been investigated in great depth respectively; however, there is very limited research that explores these ‘illusions’ together. This study aims to explore the interaction between optimistic bias and control while moderating the level of BJW. A total of 192 participants completed an online self-report survey including the Belief in a Just World Scale, and rating the probability and controllability of experiencing 42 positive and negative life events. Results of this study reveal no significant interaction between BJW-s, control and optimistic bias for positive events. Additionally, there was a significant interaction between BJW-s, control and optimistic bias for negative events, revealing that people who have high BJW-s and high control have lower optimistic bias that negative events will occur to them. These results play a critical role in enhancing overall wellbeing and reducing unwanted health behaviours, such as smoking, by eliminating the optimistic bias that illness will affect others and not oneself.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

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THE RELATIONSHIP BETWEEN OPTIMISM AND PERCEIVED CONTROL OF LIFE EVENTS MODERATED BY THE BELIEF IN A JUST WORLD

1. Introduction

There has been a considerable amount of evidence which proposes that individuals tend to have a biased outlook on life. This study aims to determine the extent to which an individual's beliefs about the world influences their optimism about experiencing positive and negative future life events, while measuring the amount of perceived control people believe to have for each event. This study is essential to the psychological literature on cognitive biases because there is very limited research that explores these three psychological constructs together (optimistic bias, control and BJW). The belief in a just world (BJW) describes the extent to which an individual views their world as just and fair for the self and for others individually. In addition, optimistic bias refers to how confident individuals are that they will experience favourable events in their future. Finally, the illusion of control refers to how much personal control an individual believes to have over their outcomes, which can vary depending on individual and event characteristics. Therefore, when investigating how individuals view their world, it is reasonable to examine these constructs together.

This research explores how people cope when they encounter unexpected life events and can explain why they do not simply give up and stop functioning when faced with horrific incidents. It can also demonstrate why people are confident that they will experience amazing and rare opportunities, even when it is not statistically possible for everyone to experience such events. Additionally, this research adds to the theory as to why people continually buy lotto tickets or can travel the world unrestricted by anxieties and fears of accidents through their illusion of control that they can adjust outcomes. Without this research, it wouldn't be understood how individuals draw on their worldviews to evaluate risks and make beneficial decisions for their future. Together these results can play a critical role in enhancing overall wellbeing by reducing unwanted health behaviours, such as smoking, or risky behaviours, such as speeding, by eliminating the optimistic bias that fatal consequences, such as cancer or accidents, will affect others and not oneself. Further, these perceptions can be moderated by how strongly an individual believes in a just world.

There has been an enormous amount of research conducted to understand how people's cognitive biases affect their subjective wellbeing. Taylor and Brown (1988) reviewed this literature and suggested that people exhibit three universal cognitive biases, or, 'positive illusions': optimism for the future, the illusion of control, and a self-enhancement bias. Accordingly, people feel more control over situations than is accurately reasonable, provide overly favourable self-evaluations, and perceive an unrealistically positive future (Lipkus, Dalbert & Siegler, 1996).

The belief in a just world (BJW) has been conceptualised as a positive illusion (Dalbert, 1992, 1993 as cited in Lipkus et al., 1996). The BJW is a theory of justice, with a central notion that people get what they deserve and deserve what they get. The BJW may be theorised as a positive illusion in that it encourages people to see their world as orderly, meaningful, and predictable, even in the face of threats to their just world framework (Dalbert, 1992; Lerner & Miller, 1978 as cited in Lipkus, Dalbert & Siegler, 1996). While there is a vast literature on optimistic bias, control and just world beliefs (BJW) respectively, there is a gap in the research that ties these three important psychological 'illusions' together.

1.1 Optimistic Bias

For over 30 years it has been reported that humans are subject to a consistent bias when estimating personal risk. Research suggests that people underestimate their chances of experiencing negative events, and overestimate their chances of experiencing positive events (e.g., Harris & Guten, 1979; Weinstein, 1980, 1982, 1984, 1987 as cited in Shah, Harris, Bird, Catmur & Hahn, 2016). For example, people underestimate their chances of getting divorced, being a victim in a car accident, or suffering from cancer. Individuals also expect to live longer than others, overestimate their professional success within their careers, and believe that their children will be especially gifted (Sharot, 2011). Even for pure chance events (e.g. picking a card out of a deck), people sometimes show these biases (Irwin, 1953; Langer & Roth, 1975; Marks, 1951 as cited in Weinstein, 1980). This phenomenon reflects not only a positive outlook on life, but a cognitive error in judgement known as the optimistic bias, which has become one of the

most consistent and universal biases documented in psychology and behavioural economics (Sharot, 2011).

Optimistic bias is defined as the difference between a person's expectation and the outcome that follows. If the expectations are better than reality, the bias is optimistic (Sharot, 2011). But what is reality? Researchers often compare participant's scores to a known baseline through the average frequency of experiencing the event, such as the rate of developing dementia. Further, reality can also be established when participants are asked to describe their chances of experiencing an event compared to others. Even though this does not allow researchers to compare responses with a 'reality' benchmark, optimistic bias is still evident when people rate their chances as higher (or lower) than others (Weinstein, 1980). In reality, it is impossible for a group of participants to rate their own chance as significantly higher or lower, as not everyone can be better or worse off than others.

Studies report that approximately 80 percent of the population display an optimistic bias (Sharot, 2011). Optimistic errors seem to be a central part of human nature, which has been observed across gender, race, nationality, age, education and occupation group (Weinstein, 1987). Weinstein conducted two studies to investigate how unrealistically optimistic people were about future life events. 258 college students estimated their own chances of experiencing 42 events compared to the chances of their classmates. Generally, they rated their own chances to be above average for positive events and below average for negative events (Weinstein, 1980).

Despite this unrealistic view, optimistic bias is vital to our survival. Biologists Ajit Varki, Danny Brower and others have argued that the evolution of mankind may come to a halt without optimistic illusions (Sharot, 2011). With the ability to imagine one's future comes the distressing reality that old age, sickness, decline in mental power, and fatality await. Varki and Brower suggest that this awareness on its own would be enough to interfere with our daily functioning and eventually bring our routine activities needed for survival to a complete stop. However, if this conscious reality evolved alongside optimistic illusions, it would not become an evolutionary psychological barrier (Sharot, 2011). It is for this reason that the benefits of unrealistic optimism stand to outweigh the downfalls. The absence of optimism for future events is

associated with mild depression and anxiety, suggesting that optimism is vital to mental health (Jiang, Yue, Lu, Yu & Zhu, 2015; Sharot, 2011). Optimism is also beneficial for physical health, success in the professional domain, and achievements in education and sport (Sharot, 2011).

However, it is important to note that excessive optimism can be dangerous. Underestimating risks may reduce preventative behaviours such as safe sex, attending medical screenings or buying insurance. As a consequence, excessive optimism could instead promote harmful behaviours including smoking, over-spending, and unhealthy eating due to the optimistic assumptions that unwanted future outcomes (such as lung cancer, bankruptcy and obesity) are unlikely to happen to oneself and that positive future outcomes are more likely to occur (Sharot, 2011).

Unrealistic optimism may reflect a distortion in personal risk estimates, a distortion in the perceived risk of the comparison target, or both. It has also been proven to have a neurological basis, suggesting that people may be predisposed to it. Further, optimism may originate from motivational sources, for example a desire to prevent harm, or from cognitive processes, such as the person-positivity bias or egocentric rationalising (Chambers & Windschitl, 2004; Shepperd, Carroll, Grace, & Terry, 2002 as cited by Shepperd, Klein, Waters & Weinstein, 2013). Importantly, when researchers provided study participants with relevant information about other participants, the individuals realised that they were not so different from others, and their unrealistic optimism declined (Epley & Dunning, 2000 as cited by Shepperd, Waters, Weinstein & Klein, 2015).

Moreover, Weinstein (1980) argued that optimistic bias is influenced by four event characteristics: the event's undesirability, its controllability, its frequency, and its stereotype salience (i.e. the extent to which there is a stereotype about the person that is typically affected). Early research has provided strong support that optimistic bias is larger for more controllable events (e.g. alcoholism) and less frequent events (e.g. AIDS), while evidence for the effects of event undesirability and stereotype salience are mixed. Further, optimistic bias has been proven to increase when people believe that if a problem has not yet appeared, they will be exempt from future risk (Weinstein 1987). In addition, the more information people have about future events, the more realistic they

are. For example, Shepperd and colleagues found that people were less unrealistically optimistic when they received base-rate information about an event (Shepperd et al, 2015).

In accordance with Weinstein's findings, previous research suggests that there is a significant relationship between optimistic bias and perceived control, such that the greater control people perceive over future events, the greater their optimistic bias.

1.2 The Illusion of Control

The illusion of control refers to the theory that an individual can manipulate, influence, and control outcomes of chance events. This belief emerges due to people's inability, or reluctance to discriminate between 'skill' and 'chance' situations. When people act as if they attempt to influence outcomes of pure chance events by 'skillful' actions, their behavior is considered to reflect an illusion of control (Budescu & Bruderman, 1995).

There is a considerable amount of evidence for the existence of this bias. Langer (1975) discovered that people placed more value on lottery tickets when they picked them out of a box, as opposed to the experimenter handing them out; Langer and Roth (1975) reported that subjects had higher confidence in predictions of chance events when they physically tossed a fair coin; and Gold and Hester (1987) demonstrated that people's predictions regarding pure chance events are affected by irrelevant manipulations of the chance mechanism, such as by replacing the coin being tossed (Budescu & Bruderman, 1995).

The previous investigations have a common feature: even though the participants' behaviour was not the actual cause of the outcome, people still believed that they were controlling the results (Yarritu, Matute & Vadillo, 2014). Langer (1975, 1977) concluded that an illusion of control could be enhanced by manipulating variables that are associated with skill, such as competition, choice, familiarity and involvement (Budescu & Bruderman, 1995).

1.2.1 The link between Perceived Control and Optimistic Bias

Research suggests a relationship between optimistic bias and perceived control such that the greater control people perceive over future events, the greater their optimistic bias. Klein and Helweg-Larsen (2002) conducted a meta-analysis of 27 independent samples in order to examine the size of this relationship and determine the variables that moderated the correlation. Greater perceived control was significantly related to greater optimistic bias. However, this association was moderated by sample variables such as nationality, student status, and risk status as well as how optimistic bias was measured (Klein & Helweg-Larsen, 2002). In addition, McKenna (1993) compared people's estimates of their likelihood of being involved in an automobile accident as a driver (with control) and as a passenger (without control). Participants reported no differences in the likelihood of experiencing an accident as passengers between their chances and those of other passengers, but estimated their chances of an accident as drivers to be considerably lower than other drivers. In McKenna's view these results indicate that the illusion of control is a necessary condition for optimistic bias. However, his analysis fails to consider the fact that people's estimates are biased because they have direct access to their own intentions and actions but only limited knowledge of similar actions taken by others (Budescu & Bruderman, 1995).

Although a great deal of emphasis has been placed on the benefits of these illusions, there are potential negative effects. For example, if an individual overestimates their skill in tasks like driving, and believe that negative events (i.e. accidents, speeding fines) will not happen to them, people may fail to engage in self-protective behaviour and instead may take more risks, such as speeding, which may be perceived as all benefit and no cost (McKenna, 1993).

This association between perceived control and optimism bias has not just been found in adults, but also in adolescents. Whalen et al. (1994) found a strong association between control and optimism in 6th graders, Quadrel and colleagues (1993) highlighted that teenagers who viewed themselves as invulnerable believed they had more control of events, and Hoorens and Bunnk (1993) reported a significant positive relationship between the illusion of control and optimism in high school students (Schinnerer, 2000). Thus, there has been a great deal of consensus that optimistic bias is affected by perceived control for both adolescents and adults.

1.3 BJW – Theory

The belief in a just world (BJW) has been described as a positive illusion because it encourages people to see their world as orderly, meaningful, and predictable, even when it actually isn't (Lipkus, Dalbert & Siegler, 1996). According to this theory, people have an innate psychological need to believe that the world is a fair place (even though it is not) where individuals get what they deserve (Sutton & Winnard, 2007). The need to believe in a just world stems from the importance of deservingness for people (Ellard, Harvey & Callan, 2016). Lerner proposed that people place a larger amount of emphasis on deserving: if good things happen in the world, we prefer they happen to good people and if bad things happen, we equally must prefer they happen to bad people (Ellard et al., 2016). Put differently, we need to believe that people get what they deserve. Lerner grounded his thinking about the origins of BJW on the early experiences and associated cognitive development of children (Lerner, 1977 as cited by Ellard et al., 2016). As children learn to decline immediate rewards and pursue long-term goals they establish an implicit personal contract with the world (Sutton & Winnard, 2007). Research has shown that children link deservingness and their gratification of their personal contract (Ellard et al., 2016). Although the just world theory does not exist in conscious awareness, it nonetheless extensively affects how people perceive and experience daily life, remember the past and think about the future (Ellard et al., 2016).

The just world theory originated from a study conducted by Lerner and Simmons (1966) where they assessed participants who viewed a young woman performing a learning task. Each time the woman made a mistake, which was often, she appeared to receive a painful electric shock. When the researcher confirmed that the participants could not stop the woman from receiving the shocks, and that the painful learning task would continue, the participants' typical responses were surprising. They rejected and devalued the woman (Bartholomaeus and Strelan, 2019). The BJW theory provides an explanation for the participants' unexpected reactions. As the participants were unable to put a stop to the woman's suffering, they instead needed to rationalise it. They could either accept that she was innocent and was receiving an underserved suffering (the world is unjust) or presume she had done something to deserve her suffering (the world is just). Because it is usually beneficial to believe in a just world,

participants were motivated to maintain their BJW and thus determined that the woman deserved her suffering due to her supposed bad character or due to a terrible act she had conducted (Bartholomaeus & Strelan, 2019).

Further research into the just world theory exhibited the distinction between a belief in a just world for the self (BJW-self) and a belief in a just world for other people (BJW-others). These two dimensions are positively correlated, but have theoretically and empirically distinct functions.

1.3.1 BJW – Self

BJW-s assists people to assign meaning to injustices by placing the event within their just world framework. When people believe the world is just for themselves, they are able to cope with hardships by finding meaning in their suffering, by downplaying or rationalising it, or by perceiving their treatment by others as deserved (Dalbert & Filke, 2007; Dalbert & Stoeber, 2005 as cited by Bartholomaeus and Strelan, 2019). To illustrate, picture a student who just passes a test after studying hard. Having a strong BJW-s, she may understand her injustice by reasoning, “I must have had an off day, my mark is not an injustice, and the world remains a fair place” or she might have downplayed the outcome “this mark could have been worse; the world is still a fair place”.

This way of thinking arises from an implicit “personal contract” which is developed when children learn to inhibit immediate pleasure in order to earn greater long-term rewards (Ellard et al., 2016; Sutton & Winnard, 2007). For example, imagine a child who spends his afternoons undertaking chores, instead of playing video games with his friends. He denies his immediate pleasures of playing games to complete his chores and earn pocket money. Upon completion he feels that he deserves to be rewarded for his hard work. When he gets his weekly pocket money, the principle of deserving is reinforced. Through repeated experiences, the deserving is reinforced and further strengthens the personal contract. Faith in this personal contract gives life a sense of predictability, control, and meaning, and allows people to plan toward their futures with optimism. Consequently, individuals are able to progress through life

confident in the expectation that they will be treated fairly (Ellard et al., 2016). Dalbert (1999) extended the idea of the personal contract, arguing that to the extent that individuals expect to be treated fairly and decently by the world, they must treat others decently and fairly in return as evidence to the contrary may threaten one's own entitlements (Bartholomaeus and Strelan, 2019).

1.3.2 BJW – Others

People need to believe that the world is a just place where individuals get what they deserve. Instances of undeserved outcomes are therefore threatening. People respond to such threats by trying to restore justice, often through defensive mechanisms (Hafer & Sutton, 2016). Lerner (1980) argued that people engage in a variety of cognitive and behavioural strategies to maintain a perception of justice in the face of threat (Ellard et al., 2016). These strategies can be either rational or non-rational. Rational strategies involve taking action, often with a focus on victims, and attempt to limit injustices before they occur or assisting victims after an injustice has occurred. On the other hand, a review on non-rational strategies demonstrates that the most extensively investigated tactics are victim blaming and derogation (Ellard et al., 2016; Sutton & Winnard, 2007). Research also suggests that people who have a strong belief that the world is just tend to blame victims and hold prejudices towards disadvantaged groups such as refugees, AIDS sufferers, the unemployed, the elderly, and the poor (Sutton & Winnard, 2007). Given that blame and negative evaluations help to justify a victims' fate as deserved, it is not unexpected that researchers have discovered an association between BJW and the perceived deservingness or fairness of a victim's injustices (Hafer & Sutton, 2016).

1.4 The link between BJW, Optimism and Control

Individuals with a high BJW-s tend to have a positive outlook on their future, and consequently, they also tend to be high achievers in their academic, work, and life accomplishments. BJW-s is correlated with a positive viewpoint across a variety of contexts and populations. Research examining victims of natural disasters has found a relationship between BJW-s, hope, and life satisfaction (Şeker, 2016; Xie, Liu & Gan, 2011).

Experimental evidence shows that BJW-s is associated with an optimistic outlook on career success (Bartholomaeus and Strelan, 2019). It is also positively correlated with students' expectations that they will secure a long-term job (Nudelman et al., 2016 as cited by Bartholomaeus and Strelan, 2019). Further, BJW-s predicted confidence that young adults would attain their life goals (Sutton & Winnard, 2007). A similar finding was reported by Otto and Dalbert (2005) in their study of young German prisoners. They reported that prisoners with a strong BJW-s had a higher level of confidence that they would achieve their personal goals and have fewer complications within the prison (Sutton & Winnard, 2007). Finally, research by Jiang and colleagues (2015) identified that a strong belief in a just world influences optimism and can improve mental health.

The idea that a belief in a just world provides a sense of control has always been central to the BJW theory, regardless of the self or general dimension. Greater internal locus of control is related to a stronger BJW (Hafer & Sutton, 2016). This is considered a healthy disposition because it enables individuals to take responsibilities for their actions (Corey, Troisi & Nicksa, 2015). Thus, individuals with a strong BJW believe they will be treated fairly and should feel confident that, as long as they have control to reach their long-term goals, they will be rewarded accordingly (Hafer & Sutton, 2016). Further, individuals who view themselves positively and maintain an unrealistically optimistic belief that they have control over their future, tend to show higher subjective well being compared to those who had less optimistic perceptions (Jiang et al., 2015).

1.5 Hypotheses

Based on the previous research indicating that BJW-s is associated with positive affective outcomes there will be a main effect of BJW-s on the likelihood of experiencing a positive event. Based on research showing that (greater) perceived control is significantly related to (greater) optimistic bias, there will be a positive relation between perceptions of controllability and the likelihood of experiencing a positive event. Therefore, there will be an interaction. According to the illusion of control theory, when perceived control is low, people with high BJW-s will have a higher optimistic bias than individuals who have a low BJW-s. Additionally, when

perceived control is high, both individuals with high and low BJW-s will have a high optimistic bias that they will experience positive future events, so there should be no difference in either BJW group. The illusion of control is a positive misconception that causes people to believe that their skills, personal involvement and manipulation can influence the outcomes of positive events, regardless of whether they realistically can or not. Therefore, an illusion of control will have a stronger influence on results.

Therefore, hypothesis 1 states:

- 1) People who have high just world beliefs (BJW-S) will have higher optimistic bias on positive events and will score higher on events which they perceive as controllable (Figure 1).

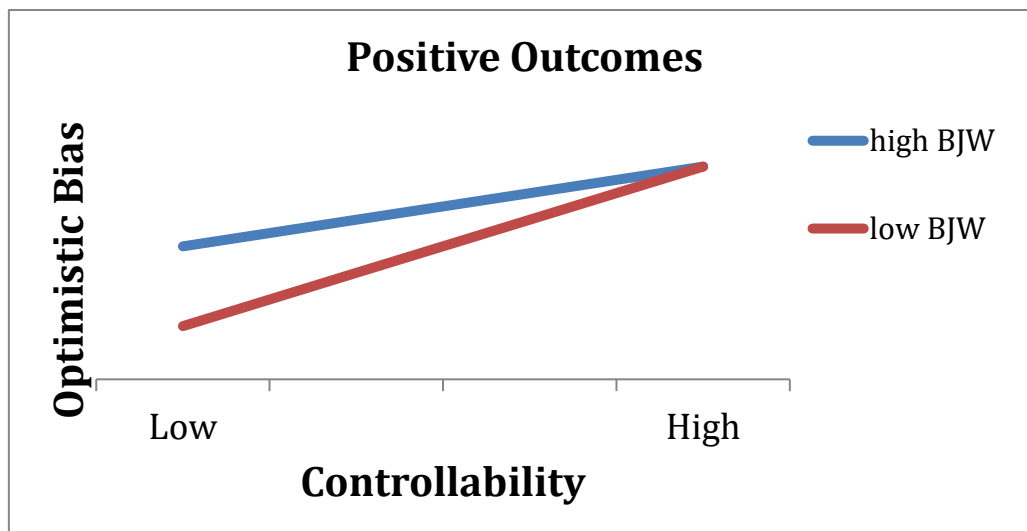


Figure 1. Probability of positive event outcomes occurring

Secondly, based on previous literature illustrating that BJW-s is associated with negative outcomes there will be a main effect of BJW-s on the likelihood of experiencing a negative event. Based on research revealing that a high illusion of control is associated with a lower optimistic bias of experiencing negative outcomes, there will be a negative relation between controllability and the likelihood of experiencing a negative event. Therefore, there will be an interaction. When perceived control is low, individuals with high BJW-s will have a lower belief that they will not be victim to negative future events, while people with low BJW-s will be slightly more pessimistic that negative events will happen to them. This is because individuals with high BJW-s believe that the world is a fair place and that others who have done things to deserve misfortune, will be victim to negative events and not themselves. In contrast,

those with low BJW-s believe that the world is an unfair place for them, so they judge that they will have more chance of experiencing negative events than other people. However, when control is high, those with high BJW-s will remain to have a much lower optimistic bias that they will experience negative events, while individuals with low BJW-s will only have a slightly lower expectancy that they will experience negative events. The illusion of control is a positive bias that allows people to have a strong sense of control over their future, therefore, all individuals should show a decrease in optimistic bias when control is high, however, this decrease will be larger for those with high BJW-s because they believe they can influence their future outcomes and deserve good things to happen to them. Therefore, hypothesis 2 states:

2) People who have high just world beliefs (BJW-S) will have lower optimistic bias on negative events and will score low on events in which they perceive as controllable (Figure 2).

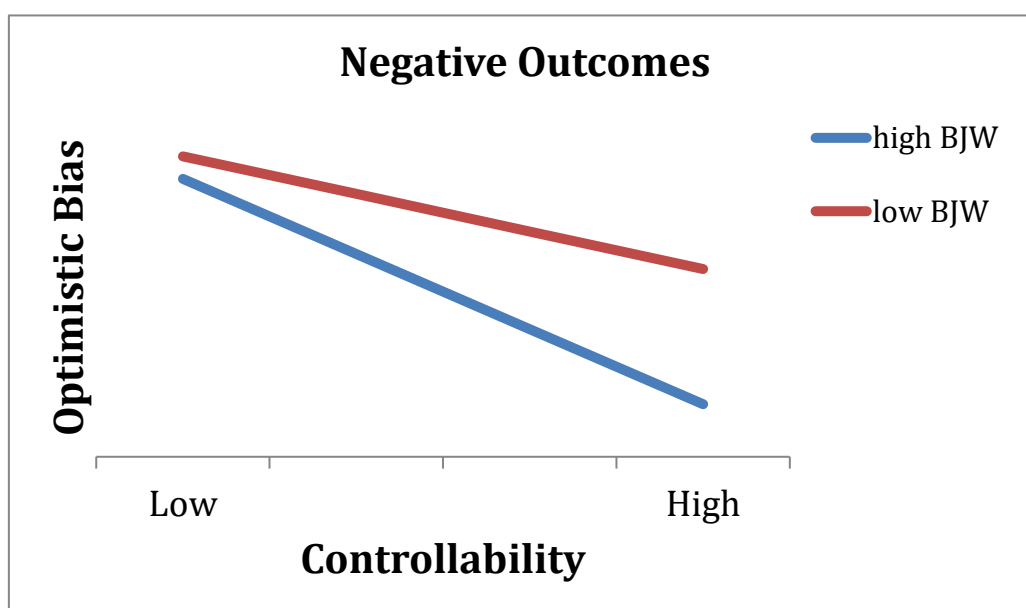


Figure 2. Probability of negative event outcomes occurring

Additionally, an exploratory analysis will explore the relationship between BJW-others and optimistic bias. BJW-o may be relevant to this research because it is correlated to BJW-s. In addition, the study asks participants to compare themselves to others. However, BJW-o may not be relevant because the event scenarios are not asking participants to think about others specifically. Hence, it is difficult to know whether

BJW-o will be significantly associated with optimistic bias, which is why its effects will be explored.

2. Method

2.2 Participants

Participants were a convenience sample of 192 (75 male, 115 female, 2 don't identify as either, mean age = 24.13, SD = 11.66, range = 18-67) residents from Adelaide, South Australia. The participants were eligible to partake in the study if they were over the age of 18 and were gathered from the University of Adelaide's first year psychology research participation pool, from a Facebook advertisement and through personal requests from snowball sampling. All participants were volunteers as they actively self-selected into the study. Participants recruited from the University of Adelaide's first year psychology research pool were offered course credit (.5) for completing the survey (135 participants), while volunteers sourced from the general public were offered no compensation (57 participants).

2.3 Measures

Three standardised self-report measures were used to assess world beliefs, optimistic bias and controllability. Additionally, participant's demographic information was also collected.

2.3.1 Just-World Beliefs

To measure just-world beliefs, I used the Belief in a Just World Scales (Lipkus et al., 1996) differentiating BJW-self (8 Items; e.g. "I feel that the world treats me fairly", "I feel that I get what I deserve") and BJW-others (8 items; e.g., "I feel that the world treats people fairly", "I feel that people get what they deserve"). For the BJW-self items, participants were asked: "How well do you think the following statements apply to YOU?" and for the BJW-other items, they were asked: "How well do you think the following statements apply to OTHERS (people other than yourself)?" Participants

responded to all items on a Likert scale, ranging from completely disagree (0) to completely agree (6), with higher scores indicating a stronger belief in justice. The BJW-self and BJW-others scales have excellent psychometric properties and both scales showed good reliability (Cronbach's alphas = .87 and .89).

2.3.2 *Optimistic Bias Task*

To measure optimistic bias participants were asked to evaluate the *probability* of experiencing of 42 life events, which are listed in Table 1. These events were a mixture of previously designed events (i.e. Weinstein, 1980), and the remaining events were developed by myself. These events were designed to be clearly positive (19 events) or negative (23 events), and came from five different important life domains (i.e. health, lifestyle, achievement, disasters, relationships). The events were randomised to avoid rote responding. Further, the events needed to be applicable to a broad range of people so that the general population were able to complete the survey. For example, the event 'being injured while horse back riding' would be inappropriate because it only applies to people who choose to horse ride. Survey instructions explicitly asked participants to compare themselves to others with similar demographic characteristics; "*Compared to other people your age – the same sex as you – what do you think are the chances that the following events will happen to you?*" Above the description of each event were the following choices: "100% less, 80% less, 60% less, 40% less, 20% less, 10% less, average, 10% more, 20% more, 40% more, 60% more, 80% more, 100% more. Higher scores revealed an optimistic bias. Mean scores were computed for both positive and negative event probability distinctively.

2.3.3 *Controllability*

Then, the 42 life events were rated for *controllability* to measure participant's illusions of control. Instructions on the survey stated, "How much control do you think you have over each of these events occurring to you?" (1 = no control, 2 = slight control, 3 = moderate control, 4 = strong control, 5 = complete control). Higher scores indicated more control and thus, a higher illusion of control. Mean scores were then computed for both positive and negative event controllability separately.

Finally, demographic information regarding the participant's age and gender was solicited.

2.4 Procedure

A correlational survey design was employed to assess the hypothesised relationships between BJW and optimistic bias, while adjusting control. The study gained approval from the Human Research Ethics Committee at the University of Adelaide and participants were provided with an information sheet notifying them on the aims of the study and how their participation would contribute to the research. Then, they were asked to electronically provide informed consent prior to completing the survey. After consent was confirmed, participants were required to complete the just world beliefs scales, event probability and controllability scales and a demographic questionnaire, online. Task instructions emphasised that participants should compare themselves to others with similar demographic characteristics, and not merely rate each event in terms of how likely or unlikely it seemed. Although there was no time limit on the task, participants were able to complete the survey in approximately 15 minutes.

Table 1. Unrealistic Optimism for Future Life Events

Positive events	Negative events
1. Not ill all winter	20. Being sick in bed for 4 days or more
2. Having your sporting team win the premiership	21. Being in a car accident
3. Winning a free massage	22. Losing your license
4. Meeting someone with whom I really click	23. Your credit card details being stolen
5. Getting a good job offer before you graduate	24. Getting a flat tyre on a road trip
6. Receiving employee of the month	25. Not being recognised for overtime at work
7. Living independently past 90	26. Losing all information on your computer due to water damage
8. Needing minimal medication in old age	27. Eating at a restaurant and getting food poisoning
9. Winning the cross lotto (lottery)	28. Developing some form of cancer
10. Owning your own home	29. Contracting an STD
11. Travelling to Europe	30. Being sentenced to jail
12. Having good communication with your family	31. Being a victim of burglary
13. Leaving a country days before a volcano erupts	32. Developing an addiction e.g. smoking, drinking, gambling
14. Your house still standing after a bushfire	33. Being in a toxic relationship
15. Not boarding a plane that ended up crashing	34. Being sterile
16. Liking your first full-time post-graduation job	35. Falling out of love with your partner
17. Having your work recognised with an award	36. Having gastro on your cruise ship
18. Having a mentally gifted child	37. Being a victim in a terrorist attack
19. Living past 80	38. Realising you chose the wrong career path
	39. Being long-term unemployed
	40. Being fired from a job
	41. Buying a car that turns out to be a lemon
	42. Developing dementia

3. Results

3.1 Participant optimism and control ratings for positive and negative events

Before proceeding to test the hypotheses, I examined participant's ratings of experiencing 42 positive and negative life events, and the amount of control they believed to have over each event. Table 2 shows that the majority of positive events have a negative mean for optimism, indicating that participants were pessimistic about experiencing these positive events. Negative event means were mostly in the expected negative direction.

Table 2. Descriptive statistics of unrealistic optimism for future life events

Event description	Optimism		Control	
	M	SD	M	SD
Positive events				
1. Travelling to Europe	27.448***	47.999	4.177***	.932
2. Having good communication with your family	24.010***	49.172	3.854***	1.013
3. Owning your own home	15.000***	49.278	3.849***	.951
4. Meeting someone with whom I really click	12.031***	46.854	2.625	1.156
5. Living past 80	7.813*	41.559	2.448	1.007
6. Liking your first full-time post-graduation job	2.188	37.282	2.896***	.965
7. Receiving employee of the month	-1.979	40.355	3.104***	.997
8. Having a mentally gifted child	-2.240	39.389	1.531***	.903
9. Having your sporting team win the premiership	-3.438	43.950	1.750***	1.135
10. Having your work recognised with an award	-5.729*	39.625	2.885***	.996
11. Needing minimal medication in old age	-6.094*	38.843	2.229***	.949
12. Getting a good job offer before you graduate	-6.719*	44.735	3.000***	.987
13. Not boarding a plane that ended up crashing	-8.281**	38.297	1.370***	.768
14. Not ill all winter	-8.594*	46.440	2.401	.998
15. Living independently past 90	-10.833**	43.635	2.490	1.018
16. Winning a free massage	-11.719***	38.229	1.531***	.758
17. Your house still standing after a bushfire	-12.813***	43.600	1.568***	.822
18. Leaving a country days before a volcano erupts	-13.594***	39.128	1.734***	1.017
19. Winning the cross lotto (lottery)	-46.615***	48.974	1.349***	.771
Total	6.868***	1.215	2.463	.405
Negative events				
20. Being sentenced to jail	-58.906***	45.040	4.047***	1.094
21. Contracting an STD	-40.104***	49.182	3.672***	1.117
22. Developing an addiction	-25.677***	54.269	3.828***	1.091
23. Being a victim in a terrorist attack	-22.344***	39.063	1.344***	.763
24. Being fired from a job	-20.365***	38.823	3.151***	1.094
25. Losing your licence	-18.802***	43.657	3.880***	.998
26. Being long-term unemployed	-17.396***	44.551	3.297***	1.170
27. Falling out of love with your partner	-14.063***	46.457	2.641	1.245
28. Eating at a restaurant and getting food poisoning	-12.865***	35.912	1.833***	.814
29. Buying a car that turns out to be a lemon	-12.344***	47.007	2.760**	1.264
30. Your credit card details being stolen	-11.979***	41.062	2.422	1.090
31. Being in a toxic relationship	-11.667**	51.403	3.130***	1.053
32. Being sick in bed for 4 days or more	-9.844**	44.692	2.339*	1.031
33. Having gastro on your cruise ship	-5.208*	35.284	1.766***	.826
34. Being sterile	-4.948	37.876	1.818***	1.159
35. Losing all computer info due to water damage	-4.167	43.394	2.755**	1.110
36. Being in a car accident	-3.073	33.667	2.573	.952
37. Being a victim of burglary	-3.073	29.328	1.786***	.869
38. Developing dementia	-.469	34.524	1.583***	.840
39. Realising you chose the wrong career path	-.156	42.148	3.005***	1.076
40. Not being recognised for overtime at work	1.510	40.017	2.323**	.932
41. Getting a flat tyre on a road trip	3.073	30.501	2.000***	.910
42. Developing some form of cancer	5.000*	32.343	1.781***	.808
Total	-12.516***	20.214	2.597**	.465

Note. In order to assess a person's optimism, participants estimated the difference in percent between the chances that an event would happen to them compared to someone with the same personal characteristics as themselves. Further, participants were asked to estimate how much control they have over these events occurring to them. $N = 192$. A one-sample t test was used to indicate whether the mean is significantly different from zero.

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

3.2 Descriptive statistic for BJW scores

Table 3 illustrates the descriptive statistics for BJW-s and BJW-o. This reveals that individuals have a higher belief in a just world for the self, than they believe it is a just world for others.

Table 3. Descriptive statistics for BJW-S and BJW-O

	M	SD
BJW-S	4.794	.951
BJW-O	3.414	1.053

3.3 Correlations for variables

Table 4 illustrates the correlations among events, control, BJW, and the background variables, age and gender. As predicted, for positive events, optimistic bias increases with control and BJW-s, with strong positive correlations. For negative events, optimistic bias and BJW-s have a significant negative correlation in the expected direction. Further, age is significantly related to negative events. As age increases this leads to a decrease in optimistic bias, revealing that the more life experience participants have the less likely they are to believe that unwanted future events will affect them. Gender was a categorical variable and was coded male = 1, female = 2, and I don't identify as either = 3.

Table 4. Correlations among variables

	1	2	3	4	5	6	7	8
1 Positive Events	-							
2 Negative Events	-.017	-						
3 Positive Control	.383**	-.190**	-					
4 Negative Control	.180*	-.235**	.678**	-				
5 BJW-self	.277**	-.210**	.191**	.014	-			
6 BJW-others	.174*	-.136	.286**	.270**	.369**	-		
7 Age	-.05	-.232**	-.141	-.057	-.098	-.01	-	
8 Gender	-.048	.073	-.111	-.279**	-.114	-.134	.033	-

Note. $N = 192$. * $p < .05$; ** $p < .01$

3.4 Relations between BJW-s, control and optimistic bias

I employed Hayes' (2013) PROCESS macro (version 3.3; model 1; 5000 iterations; bias corrected; 95% CIs) to run a moderation analysis in SPSS, with

optimistic bias as the outcome variable. After standardising and mean centering, control, BJW-s and the interaction (control \times BJW-s) were entered.

Table 5. Summary of moderation analysis for relations between BJW-self, control and optimistic bias, ($N = 192$).

Optimistic bias <i>B</i>		
	Positive Events	Negative Events
Control	1.048***	-10.541***
BJW-s	.284**	-4.341**
Control \times BJW-s	.203	-5.197
	$F(3,188)=15.078, p<.001, R^2 = .194$	$F(3, 188) = 8.062, p< .001, R^2 = .114$

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

Table 6 displays the adjusted positive and negative events. New mean scores were computed for all positive events with positive means and again for all negative events with negative means. This was done to measure the independent effects of optimism, while removing all pessimistic answers. Once the new means were added, the analyses were conducted.

Table 6. Summary of moderation analysis for relations between BJW-self, control and adjusted optimistic bias

Optimistic bias <i>B</i>		
	Adjusted Positive Events	Adjusted Negative Events
Control	19.747***	-11.797***
BJW-s	4.408*	-4.124**
Control \times BJW-s	2.465	-5.613*
	$F(3, 188) = 17.450, p<.001, R^2 = .218$	$F(3, 188) = 8.549, p<.001, R^2 = .120$

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

3.4.1 Hypothesis 1

It may be seen from Table 5 that both control and BJW-s were significantly associated with optimistic bias for positive events. However, the interaction (control \times BJW-s) was not significant. As demonstrated in Table 2, majority of positive events had a negative mean, revealing that people were often pessimistic about experiencing such events as opposed to being optimistic. Consequently, new mean scores were computed for all positive events with positive means to investigate optimism. As illustrated in Table 6 both control and BJW-s were significantly associated with optimistic bias, respectively. However, there was no significant interaction. Therefore, hypothesis 1 was not supported.

3.4.2 Hypothesis 2

As shown in Table 5 both control and BJW-s were significant main effects for negative events. However, there was no significant interaction. New mean scores were then computed for negative events with negative means and the analysis was repeated (see Table 6). The interaction between control and BJW-s was significant and accounted for 12% of the variation in optimistic bias. Hence, hypothesis 2 was supported.

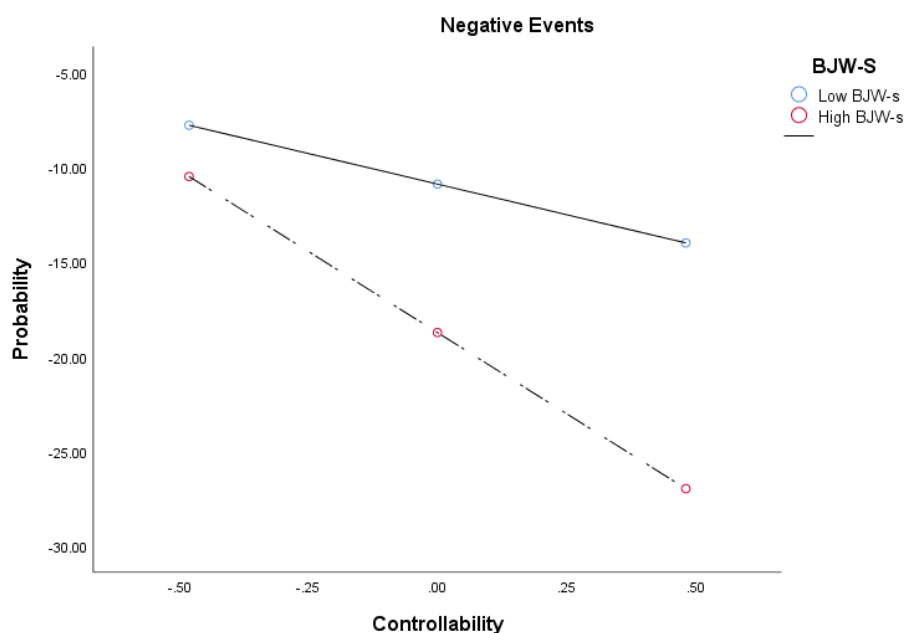


Figure 3. Interaction between control \times BJW-s on optimistic bias for negative events

An analysis of the simple slopes indicated that there was an effect of control at high BJW-s ($B = -17.134, p = .0001, CI_{95\%} = -25.488, -8.779$), but not for low BJW-s ($B = -6.459, p = .088, CI_{95\%} = 13.890, .972$) (see Figure 3). Viewed from the other angle, there was a significant effect of BJW-s at high levels of control ($B = -6.825, p = .0008, CI_{95\%} = -10.780, -2.871$) but not at low levels of control ($B = -1.423, p = .485, CI_{95\%} = -5.439, 2.592$).

Age was included as a covariate to examine if there were any significant differences in optimistic bias in the older age group compared to the younger participants. One reason for investigating such approach was the suspected theory that more life experience may lead individuals to be less optimistically biased about experiencing negative life events as they have the skills and knowledge to handle and overcome difficult situations. Age was significantly negatively associated with optimistic bias ($B = -.458, p < .001, CI_{95\%} = -.700, -.217$), and the interaction became non-significant, revealing that there is no longer an interaction between control and BJW-s ($B = -4.054, p > 0.5, CI_{95\%} = -9.364, 1.256$).

In sum, main effects for BJW-s and control were significant in the expected directions. There was no evidence of a BJW-s \times control interaction for the positive events. However, as predicted the negative event interaction term was significant, with the effect due to high BJW-s. Analyses of the simple slopes indicate that a strong BJW-s and strong levels of control drive the effect on optimistic bias. These results may be explained by age as with experience comes optimism that one can avoid unwanted future incidents from occurring.

3.5 Additional Analyses

3.5.1 Event Categories

Individuals may have unequal levels of optimism and pessimism across different domains in life (Chang, Chang & Sanna 2009). For example, one may be optimistic about receiving a promotion but pessimistic about finding a romantic partner. Previous research has revealed that high optimism and high pessimism can co-exist and

interacted with each other to affect coping strategies (Benyamini, 2005, as cited in Chang et al., 2009).

To account for possible biases within the positive and negative events (i.e. if not everyone thought the events were strictly positive or negative), the 42 life events were divided into five event categories - health, lifestyle, achievements, disasters and relationships to further explore the interactions between events and optimistic bias in different groupings. For example, all health related events (i.e. not ill all winter; being sick in bed for 4 days or more; living independently past 90; being in a car accident; contracting an STD; living past 80; being sterile; developing some form of cancer; needing minimal medication in old age; developing dementia) were grouped together and negative events were recoded so that the scores were in the same positive direction.

New mean scores were computed for the probability and controllability of all events in the same category and were tested for interactions, however there was only one interaction that was significant (disasters; $B = 4.794$, $p < .05$, $CI_{95\%} = .574, 9.014$). Nonetheless, it is fair to speculate that this interaction may be coincidental after running numerous analyses.

3.5.2 Age and Gender

Additional analyses were conducted on the covariates of age and gender. Age and gender were occasionally significantly associated with control and BJW-s separately, however there was no significant interactions between control \times BJW-s.

3.5.3 BJW-o

Further analyses were carried out on BJW-o. All above analyses were rerun with BJW-o as the moderating variable however there was no significant interactions.

3.5.4 Most controllable/least controllable events

Finally, additional analyses were run on the most controllable events and respectively for the least controllable events. These were gathered by using events with

the 10 highest mean scores for controllability and again for the 10 lowest mean scores for controllability. There was no significant interaction for either analysis.

4. Discussion

4.1 Summary of results

The goal of the current study was to determine whether an individual's beliefs about the world (BJW-s) influences their optimism about experiencing positive and negative future life events, while taking into account the amount of perceived control they believe to have over each event. Critically, this is the first study to directly examine BJW-s in relation to optimistic bias and controllability. On the basis of previous work involving these three psychological concepts, I hypothesised two avenues for positive and negative events. Firstly, hypothesis 1 indicated that people with high BJW-s will have higher optimistic bias on positive events and will score higher on events which they perceive as controllable. This hypothesis was not supported, as there was no significant interaction between control and BJW-s. Hypothesis 2 stated that people with high BJW-s will have lower optimistic bias of experiencing negative events and will score low on events in which they perceive as controllable. Hypothesis 2 was supported. I found a significant interaction between control and BJW-s revealing that people with high BJW-s and high control had lower optimistic bias that negative events would occur to them. Lastly, an exploratory analysis of BJW-o was not relevant to this study as there was no significant interaction between control and BJW-o in either positive or negative scenarios, and will not be discussed further.

4.2 Interpretation of results

4.2.1 Support of previous research

Weinstein conducted two studies to investigate how unrealistically optimistic people were about future life events. 258 college students estimated their chances of experiencing 42 events compared to the chances of their classmates. Overall, they rated their own chances to be above average for positive events and below average for negative events (Weinstein, 1980). Previous research has suggested that the evolution of

mankind may come to a complete stop without optimistic illusions, with the awareness that devastating realities such as illness and fatality come with old age (Sharot, 2011). Research has proposed that optimism is associated with a decrease in depression and anxiety (Jiang et al., 2015; Sharot, 2011), and has benefits for physical health, professional success and academic and sporting achievements (Sharot, 2011).

Furthermore, previous research suggests a relationship between optimistic bias and perceived control such that the greater control people perceive over future events, the greater their optimistic bias (Weinstein, 1980). Klein and Helweg-Larsen (2002) conducted a meta-analysis of 27 independent samples and revealed that greater perceived control was significantly related to greater optimistic bias. Research on the illusion of control was also conducted by McKenna (1993) who discovered that participants showed no differences in their likelihood of experiencing a car accident as a passenger, but there was a significant difference when participants were drivers. Overall, participants rated their own chances of being involved in an accident as lower when they were drivers, and therefore, in 'control' of the situation (Budescu & Bruderman, 1995). Finally, this association between perceived control and optimistic bias has not just been found in adults, but has also been documented in adolescents, revealing that this association between control and optimism is widespread across different age groups (Whalen et al., 1994; Quadrel et al., 1993; Hoorens & Bunnk, 1993 as cited in Schinnerer, 2000).

In addition, the literature on BJW-s reveals that individuals with a high BJW-s tend to have a positive outlook on their future due to the personal contract they have with the world where individuals expect to be treated fairly and decently (Lipkus, et al., 1996; Bartholomaeus & Strelan, 2019). Faith in this personal contract gives life a sense of predictability, control, and meaning, and allows individuals to proceed through life confident that they will be treated positively (Ellard et al., 2016).

BJW-s has been shown to be positively correlated with students' expectations that they will secure a long-term job (Nudelman et al., 2016 as cited by Bartholomaeus and Strelan, 2019), predict confidence that young adults would attain their life goals (Sutton & Winnard, 2007) and shown that young German prisoners had more

confidence that they would achieve their personal goals and have fewer issues within the prison (Sutton & Winnard, 2007).

Further research investigating control, BJW and optimism proposed that a greater internal locus of control is related to a stronger belief in a just world (Hafer & Sutton, 2016). Thus, individuals with a strong BJW believe they will be treated fairly and should feel confident that, as long as they have control to reach long-term goals, they will be rewarded accordingly (Hafer & Sutton, 2016). Further, individuals who view themselves positively and maintain an unrealistically optimistic belief that they have control over their future, tend to show higher subjective wellbeing compared to those who had less optimistic perceptions (Xiang, 2016).

4.2.2 Support of theory

The previous research is in accordance with the theory on optimistic bias, control and BJW. The optimistic bias theory proposes that people overestimate their chances of experiencing positive events and underestimate their chances of experiencing negative events (Weinstein, 1980; Harris & Guten, 1979; Weinstein, 1982, 1984, 1987 as cited in Shah et al., 2016; Sharot, 2011).

Furthermore, the theory on the illusion of control indicates that one can manipulate, influence and control the outcomes of pure chance events. The illusion of control could be enhanced by manipulating variables that are associated with skill such as choice, familiarity and personal involvement (Budescu & Bruderman, 1995).

Finally, the BJW theory causes people to have an innate psychological need to believe that the world is a fair place, where individuals get what they deserve, even when it is not always fair (Sutton & Winnard 2007). This theory stems from the importance of deservingness, where good things happen to people who deserve them, and bad things occur to those who deserve their misfortunes (Ellard et al., 2016).

4.2.3 Hypothesis 1

Despite the previous literature and theory, hypothesis 1 was not supported. There were significant main effects but no significant interaction. In other words,

control and BJW-s had an effect on optimistic bias individually, but there was no interaction between control, BJW-s and optimistic bias for positive events.

Instead of people being optimistic about experiencing positive events, participants were pessimistic, which was not predicted (See Table 2). One explanation for these results is that participants were actually unrealistically pessimistic. This bias is said to occur when events are positive and rare. For example, participants were optimistically biased that they would own their own homes, live past 80, and travel to Europe, which are relatively common events. Kruger and Burrus (2004) have proposed that the opposite is true for events that are positive and rare. They found that people are unrealistically pessimistic about their chances of owning an island or living past 100, despite the fact that these events may be more desirable than the common ones. Findings from their study may have replicated in my own with positive events such as winning the cross lotto (lottery) or having your house still standing after a bushfire, being viewed as rare and therefore unlikely to happen to 'me'.

This is a reasonable claim to understand the results, however it can be argued that this was not the case for the negative events, as I did not acquire the opposite prediction of unrealistic pessimism. However, it has been shown that unrealistic optimism is greater for negative events rather than positive ones (Gold & Martyn, 2003; Kruger & Burrus, 2004). One reason for why it might be greater for negative events is due to the motivational account and Kahneman and Tversky's prospect theory (1979) (Gold & Martyn, 2003). The motivational account proposes that unrealistic optimism occurs because individuals are motivated to draw an optimistic conclusion, since it brings a feeling of comfort (Gold & Martyn, 2003). In addition, prospect theory states that the threat of loss looms larger than the prospect of an equal gain; hence greater value is ascribed to a loss. Thus, given the plausible assumption that a negative outcome is seen as involving a loss and a positive outcome a gain, it follows that the motivation to view oneself as unlikely to experience a negative outcome would be greater than the motivation to view oneself as likely to experience a positive outcome (Gold & Martyn, 2003). This conclusion suggests that people use unrealistic optimism as a defensive mechanism to trust that negative outcomes will not happen to them. To cognitively protect oneself from negative events, such as dying at an early age or being victim in a terrorist attack, means we are able to go through our everyday lives free of anxiety and

fear of what awaits in old age. On the other hand, positive outcomes may be viewed as an added bonus for individuals to experience and are not a vital part of our psychological survival.

4.2.3 Hypothesis 2

Hypothesis 2 was supported. A significant interaction was found between control and BJW-s revealing that people with high BJW-s and high control had lower optimistic bias that negative events would occur to them. Furthermore, an analysis of the simple slopes revealed that a high BJW-s was being affected by control, but control was not significantly affecting people with low BJW-s. In addition, high levels of control were affecting participants BJW-s, but there was no effect of BJW-s at low levels of control.

This finding is supported by and consistent with the theory which states that people underestimate the likelihood of having negative events occur to them (Weinstein, 1980; Harris & Guten, 1979; Weinstein, 1982, 1984, 1987 as cited in Shah, et al., 2016; Sharot, 2011). Previous studies have also confirmed this hypothesis that participants with high BJW-s have a positive outlook on their future and believe that the world is a fair and deserving place (Sutton & Winnard, 2007) leading people to underrated their chances of experiencing negative events (Weinstein, 1980, Shah et al., 2016; Sharot, 2011). In addition, high control has been associated with a lower optimistic bias for negative events because people believe they can influence the outcomes of the results, even if it is out of their control (Klein & Helweg-Larsen, 2002).

Results of this study are also in accordance with previous research by Kruger and Burrus (2004) who demonstrate that people are likely to underestimate their likelihood of rare negative events such as being sentenced to jail or being a victim in a terrorist attack not only because they are undesirable events, but also because they are uncommon. On the contrary, people may be unrealistically pessimistic about experiencing more common events such as getting a flat tyre on a road trip or not being recognized for overtime at work. Results of their investigation revealed that participants thought they were more likely than the average person to experience the common events

and less likely than the average person to experience the rare events – regardless of whether the events were undesirable.

However, it is important to note that when age was added as a covariate it was significantly negatively associated with optimistic bias, with the added effect that the interaction was no longer significant. One reason for this non-significant interaction may be due to life experience; as individuals get older and more experienced, they learn that they can take actions to prevent negative events from happening to them and their beliefs about experiencing such events decrease. Therefore it is reasonable to assume that age may be explaining the significant interaction.

4.3 Limitations and further research

Being the first person to ever conduct this research, further investigations need to be done to confirm these results. Additionally, this study has at least three limitations that should be noted. First, the present study is correlational, therefore it cannot infer causation. In other words, it cannot be confirmed that believing in a just world causes optimistic bias for negative events. Instead this correlation between high BJW-s, high control and optimistic bias could be the cause of a third (extraneous) variable. Therefore, future research should include longitudinal designs to clarify the causal relationship between BJW-s, control and optimistic bias. Potential research should also aim to use experimental designs to manipulate BJW and observe reactions of a variety of measures including evaluations of victims, outcomes and control (Ellard et al., 2016). Further, extraneous variables such as personality type, participant's mood and depression and anxiety levels should also be investigated, as there is a large literature that reveals that depression and anxiety are associated with unrealistic pessimism (Sharot, 2011; Blair et al., 2017).

Secondly, majority of participants were students sourced from the University of Adelaide's psychology first year cohort. These results may not be generalisable to individuals from the wider population. Students may be healthier, better educated and come from wealthier homes. Thus future investigations should be replicated in a diverse range of cultural and generational communities in order to generalise results to the wider population.

Finally, the particular events used in the study could be a limitation. The events belonged to one of five contexts (health, lifestyle, achievement, disasters, and relationships) and many of these contexts have not been previously used in optimistic bias research so there may have been something limiting about the categories. Some contexts may be related to pessimism more than others and the effects of unrealistic optimism and unrealistic pessimism may have cancelled each other out. In an effort to avoid this limitation I aimed to analyse the five individual categories with BJW-s and control individually, however there was still no significant effect. It may be concluded that this breakdown is not an explanation for the results. Furthermore, future research should also investigate whether the timing of events has an impact on optimistic bias. For example, events such as developing dementia or suffering from a heart attack over the age of 60 may cause people to be unrealistically optimistic because these events are occurring so far in their future, as opposed to events such as losing your car keys or getting a flat tyre on a road trip, which may be seen to be more likely to occur as they are events which can happen now.

4.4 Implications

These findings have practical implications. The significant interaction shown between control and BJW-s reveal that people with high BJW-s and high control have lower optimistic bias that negative events would happen in their own lives. Since unrealistic optimism may make the adoption of protective behaviours less likely it would be highly beneficial to present positive behavioural messages (i.e. anti-smoking campaigns, seatbelt safety advertisements) in a way to minimise this optimistic perspective. For example, providing the public with information about the dangers of smoking or speeding fatalities may lead individuals to compare their risk with those of others and consequently, drawn on the unrealistically optimistic conclusion that 'it will not happen to me'. Hence, it is crucial to portray these messages with baseline information to make people aware of the realities of harmful behaviours and to eliminate the optimistic bias perspective that one will be exempt from future risk. To illustrate, risk taking behaviours, such as speeding were the leading cause of 80 fatalities on South Australian roads in 2018, compared to 82 fatalities as of October 2019 ("SAPOL - Traffic Statistics", 2019). These statistics reveal that individuals are

continuing to take risks because they believe that the chances of a fatal accident ‘won’t happen to me’, while in fact, statistics are continually increasing. In addition, detrimental health consequences, such as fatality from lung cancer has increased from 8,410 in 2016 to an estimated 9,034 in 2019 Australia wide ("Lung cancer in Australia statistics", 2019). One of the highest risk factors for developing lung cancer is smoking. These statistics highlight the importance of providing the general public with a realistic viewpoint that they are not exempt from these health related fatalities, no matter how unrealistically optimistic they are. Consequently, this suggestion should be embedded in prevention programs by making it clear that people apply a self-protective behaviour when visualising ones own risks about negative events and should encourage people to gain a more accurate picture of their own susceptibility to harm.

Further, these programs should be implemented for behaviours that people may view as all benefit and no cost, such as having unprotected sex or gambling, so they are provided with all the relevant information needed to make an informed decision about whether they should engage in the behaviour or not.

In addition, the interaction between control and BJW-s reveal that people with high BJW-s and high control have a lower optimistic bias that negative events would happen in their own lives. Therefore, BJW-s influences how fairly people believe they should be treated and the present study reveals that individuals with a high BJW-s believe that they will not be victim to negative events. This information can assist when helping people to overcome an addiction or to escape a toxic relationship by understanding why some individuals, particularly those with a low BJW-s, believe they ‘deserve’ to be victim to negative situations. For example, people may have committed a transgressor and have convinced themselves that they deserve nothing more but undesirable outcomes.

4.5 Conclusion

In summary, the present findings add substantially to past research of optimistic bias, the illusion of control and the belief in a just world. An abundance of research has investigated how these positive, cognitive illusions affect subjective wellbeing as distinct factors, however there is very limited research that explores these

constructs together. The present research is the first to extend these findings by investigating these three constructs together in order to understand how an individual's beliefs about their world influence their optimistic bias and controllability of their future. It was hypothesised that people who have a high belief in a just world (BJW-S) will have higher optimistic bias on positive events and will score higher on events which they perceive as controllable. In addition, the second hypothesis proposed that people who have high just world beliefs (BJW-S) will have lower optimistic bias on negative events and will score low on events in which they perceive as controllable. Overall the current findings reveal that individuals with a high belief that the world is just for the self have a lower optimistic bias that they will be victim of negative events, especially those that they believe to have high control over. However, further research is needed to replicate these findings, and to further investigate the interaction between high BJW-s and optimistic bias for positive events to test whether a correlation exists.

5. References

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