Journal of

Psychological Research

Journal of
Psychological Research

Editor-in-Chief

Dr. Inna Reddy Edara

Contents

ARTICLE

ARTICLE

The "Psychology" of Polygraph': Engendering Differential Salience - Concerns and Caveats

Friedo J.W. Herbig[*]

Department of Criminology & Security Science, College of Law, University of South Africa (Unisa), Pretoria, RSA

ARTICLE INFO	ABSTRACT
	The "success" of a polygraph examination is predicated on the establishment of differential or emotional salience (a "psychological set") with an examinee. This, according to polygraph proponents, guarantees that an examinee will respond appropriately during the administration of the in-test (questioning) phase of the polygraph examination. However, polygraph procedure, as prescribed by its governing body, the American Polygraph Association (APA), is a static clinical Westernised process that does not make any provision for human multiplicity (culture/ethnicity, idiosyncrasies, level of education, language proficiency, ideologies, and so forth). Identical (one size fits all) test procedures are applied across the board – a highly controversial methodology. This article, instead of rigidly focusing on validity and reliability issues per se, explores the degree to which certain intentional and unintentional human behaviour modification strategies have the potential to counterbalance claimed polygraph rectitude from a metaphysical and discursive standpoint. The article exposes concerns (potential flaws) relating to polygraph theory in the context of the "psychological set" and is intended to serve as a caveat regarding the unmitigated use thereof.

1. Introduction

Worldwide, criminality, including dishonesty, has become pervasive and non-pathological to the virtual point of universality [1]. For many people, the boundaries between right and wrong, and what is appropriate and inappropriate behaviour, have become vaporous. It is not surprising, therefore, that in such a mercurial environment human honesty and industriousness are highly prized virtues [2]. Veracity determination has subsequently become seminal in almost all spheres of human endeavour.

To this end polygraph examinations are frequently employed to manage human integrity, virtuousness and fidelity in an increasingly thoroughgoing way as a miracle cure for this syndrome. Establishing emotional salience with an examinee, irrespective of the type or purpose of the polygraph examination, is a fundamental precept upon which the execution of an apposite examination by a qualified and competent examiner is based. However, the establishment of this salience is no mean feat and presents certain existential challenges that are not readily taken into account by polygraph theory or its general conventions. In relation to polygraph application, people are treated, and their behaviour evaluated, in accordance with a set of rigid rules, independent of their unique persona.

Corresponding Author:
Friedo J.W. Herbig,
Department of Criminology & Security Science, College of Law, University of South Africa (Unisa), Pretoria, RSA;
Email: herbifjw@unisa.ac.za

[2] Given the diversity of the human psyche, receptiveness to the establishment of emotional salience can, for various reasons, be expected to fluctuate considerably.

This article examines certain human behaviour modification techniques, which could potentially negate the establishment of a psychological atmosphere during the pre-test phase of the polygraph examination and render the results of such examination inaccurate and/or beget a false negative or false positive outcome. It does not purport to provide an encyclopedic exposition of human behaviour modification strategies or a utopian solution to the quandary, but strives to provide food-for-thought and stimulate further discussion and research.

2. Polygraph Operation and Premises

In order to place in context the pre-test phase of a polygraph examination, during which emotional salience should be established, the following succinct exposition of the polygraph curation process is provided as an *aide memoire* [3]. All polygraph examinations involve a pre-test phase (interview and stimulation test), an in-test phase (during which several questions requiring "yes" or "no" answers are asked) and a post-test phase (debriefing). The examiner typically begins with a pre-test interview to gain some preliminary information from the examinee, which is used to develop diagnostic questions that are reviewed with the examinee. The examiner also explains the purpose of the various pieces of apparatus that will be attached non-intrusively to the examinee's body and how the polygraph is supposed to work, emphasising its efficiency and that it is important to answer truthfully and only with "yes" or "no" answers. The examinee's medical history is briefly examined and he/she is also told that the test is voluntary and that he/she can terminate it at any time. Then a stimulation test (stim test), essentially a truncated mock polygraph test, is conducted during which the examinee is instructed to deliberately lie. The tester subsequently reports that he/she was able to detect the lie "proving" that the polygraph works. The tester then proceeds to the in-test phase of the polygraph examination. During this phase the previously revised questions are put to the examinee during 3 chart sessions. Some questions asked are irrelevant, others are diagnostic and the remainder are relevant questions that the tester is really interested in. The different questions alternate. The test is passed if the responses to the diagnostic (control) questions are larger than those to the relevant questions.

The final phase of the polygraph examination is the post-test phase (essentially a debriefing) during which the examiner confronts the examinee with the results and records any admissions/confessions. Integral to this paper is the pre-test phase of the polygraph examination. It is during this phase that the polygraph examiner is required to establish emotional salience with the examinee ensuring that the examinee (at least in terms of polygraph theory) will respond appropriately to the questions posed during the in-test phase of the examination. Appropriate responses (physiological arousal) are considered those that are more pronounced in relation to either relevant or control questions based on the fear of detection of deception. More pronounced responses to relevant questions (arousal relating to involvement in the issue/incident being investigated) indicate deception; while more pronounced responses to the control questions (arousal relating to a person's background that they want to keep secret) indicate no deception. The reasoning here is that a person's body will autonomously offer a greater response to the issue/s that hold more detrimental gravitas to the examinee.

In layman's terms, therefore, polygraph application theory holds that examinees respond physiologically to test questions to which they are untruthful out of apprehension that their pretext will be exposed and penalties will follow. All things considered, the greater the fear, the greater the response. It is argued that honesty and integrity are not likely to illicit a greater physiological response than deception on the same test. Clearly, this stereotype invokes a universal, but not necessarily accurate, norm that one should be honest, and if one is not, that measurable "feelings of shame" are to be felt. It is important to remember, however, that polygraph examinations are designed to measure arousal caused by fear of detection of deception, which can be affected by, amongst others, anxiety, anxiety disorders, such as PTSD, nervousness, fear, confusion, hypoglycemia psychosis, depression, substance induced states (nicotine, stimulants), substance withdrawal state (alcohol withdrawal) or other emotions. Polygraphs cannot differentiate anxiety caused by dishonesty and anxiety caused by something else [4].

Consonant herewith Grubin states that the polygraph instrument does not recognise lies and that a specific psychological lie response has never been demonstrated and is unlikely to exist. Instead the polygraph instrument records physiological activity associated with arousal in the autonomic nervous system [5]. The responses it measures are not unique to deception, nor are they always engendered by it [5]. Whether this arousal is caused by a fear of being caught out in a lie, a conditioned response to the act of lying, orientation to a matter of emotional salience, the increased cognitive processing required for deception, or some other mechanism remains unclear. The assumption underlying lie detection technologies is that individuals feel about their spuriousness as an outside party would.

Not only is it a flawed position given the multiple causes of autonomic arousal, but even if it was possible to distinguish between types of arousal, it would be unreasonable given the manifold possibilities. Simply stated, the polygraph paradigm fails to control for alternative explanations for arousal [6, 7].

3. Engendering the "Psychological Set"

Prior to the actual polygraph examination (in-test phase), it is, importantly, the aim of the polygraph examiner, during the insipient stage of the polygraph examination, to establish a state of emotional salience (a psychological set) with the examinee that is believed to elevate the likelihood of arousal to stimuli (test questions). The polygraph examiner attempts to, during this phase, instill a fear of detection of deception in the examinee. Polygraph theory dictates that examinees will, after being subjected to the "psychological set" procedure be sufficiently psychologically primed so that the likelihood of any observed arousal to specific questions due to deceptive responses will be increased [5]. Regrettably, the establishment of this state is treated as an unambiguous, one-dimensional construct instead of complex and multidimensional. Polygraphy, therefore, assumes that everyone is equally susceptible to the establishment of emotional salience and does not make provision for human equanimity or variance.

Marginalisation of this pre-test phase procedure is also prone to occur amongst examiners where economic or other pressures are brought to bear and many tests must be performed within a specific time period (especially in a competitive labour market). This disturbing occurrence further serves to place in context the increasingly opaque silhouette of the interface between emotional salience establishment on the one hand, and the potential of human behaviour modification to frustrate this process, on the other. Notwithstanding, the establishment of emotional salience is attempted, even though there is no definitive indication of its establishment during the pre-test phase.

Despite an examiner's best attempts, whether emotional salience has been established or not, will never be known. Although quite conceivable that those invested in the procedure, and susceptible to it, will be primed to answer questions in the appropriate way, i.e., more pronounced responses to either relative or control questions based on the fear of detection of deception, it is equally feasible, however, that due to behaviour modification techniques an individual will be able to circumvent these "appropriate responses". Just because larger responses are recorded for relevant questions or for control questions does not necessarily mean that one person is guilty and another is innocent. Human behaviour transmutation as well as other

forms of arousal that have no bearing on guilt or innocence per se can play a role in examination results as well. The one-on-one interview between the examiner and the examinee and the stim test are, in practice, merged with one another, and together constitute the pre-test phase of the polygraph examination.

3.1 The Pre-test Interview

The pre-test interview is primarily designed to convince the examinee that the polygraph instrument can accurately measure deception and is done by means of examiner narrative whilst engaged in an "interview" with the examinee. It is during the interview that precedes the test that the examiner instills a belief that the test is efficacious. There is, however, a perplexing ambiguity in the pre-test interview for this ostensibly "objective" means of assessing a subject's veracity. The examiner must accept the examinee's word that that he/she understands/accepts the polygrapher's view of the test. Equally important, is the fact that the examiner designs questions that that he/she expects the guiltless subject to be highly concerned about. Again, such a supposition is ironic. The polygraph examiner has no independent means to assess whether any obvious concern is embedded in legitimate fear of revealing damaging/embarrassing information or whether the subject's concern is "normal" [6]. Notwithstanding, rapport is supposedly built, the examiner embellishes his/her detection successes and competence, apparatus to be used is placed in context, and various permissions are sought from the examinee. The individual's medical history is also superficially discussed to determine appropriateness (psychological and physical) for undergoing the exam. The interview with the examinee culminates in the application of the stimulation test.

3.2 The Stimulation Test

Stimulation tests are designed to, in tandem with the one-on-one interview, enhance examinee responsiveness by demonstrating the "power" of a polygraph test – essentially to reinforce the verbal instruction of the examiner during the pre-test interview (the polygrapher's injunction about the infallibility of the test). According to Memon, Vrij, and Bull, the main goal of the stim test is to convince the examinee that the polygraph is accurate and can detect every lie [8]. For example, the person is asked to pick a card from a pack of playing-cards. An increased physiological reaction is expected when the examiner, using a gambit, identifies the card the examinee has chosen. In fact, polygraph theory dictates that the success of a polygraph examination is dependent on the examiner creating

the proper psychological situation (emotional salience). The examiner attempts to induce in the subject the belief that the test works and instills a fear of detection of deception. It is purportedly this fear of a lie (or lies) being exposed that produces pronounced arousal to either control or relevant questions [6].

4. Dynamics of lying

People have fluctuating opinions vis-à-vis lying. On the one hand, honesty, truth and ethical conduct are valued; conversely, people think that although lying is condemnable, it is quite inevitable [2]. Moreover, the skill of cheating may be a benefit in social interactions and serve to protect oneself or a group one belongs to. The ensuing exposition endeavours to provide some context relating to the inherent challenges associated with polygraph application. By examining the motivation/s behind lying and by juxtaposing the reasoning with the pragmatisms associated with such practice, an existential mosaic is created facilitating evaluation and deduction. According to Tooker, self-oriented lies are those lies told to make the teller appear better or to gain some personal advantage [9]. Such lies account for half of all the lies told, in order to, amongst others, make a positive impression, protect oneself from embarrassment/disapproval, obtain an advantage in a situation and/or avoid punishment/chastisement/a negative consequence [10]. By way of example, in relation to a job seeker, this could entail lies perceived as justifiable in order to obtain an advantage in a scarce or competitive market – and viewed by such person as a strategy rather than a veracity/moral issue.

Fabricating the truth under such circumstances might not necessarily be seen as a violation of one's personal integrity as an individual can become tolerant of his/her deception in certain circumstances. In essence an individual reverse engineers integrity from ubiquity and ceases to believe that something so justifiable can be wrong – deviance/duplicity, therefore, even though it appears kafkaesque, becomes entwined with the concept of veracity, so to speak, and the person believes what he/she is saying is plausible (confabulation) [11]. The individual essentially sees the polygraph test as a challenge more than a threat or truthfulness test per se and they will, according to Gozna, Vrij and Bull, be difficult to detect when they lie in high stake settings as they will exhibit an apparently honest demeanour while being void of experiencing emotion or cognitive effort [12]. The negative consequence in the example mentioned above would amount to not being considered for, or not obtaining, the employment sought should deception be detected during a credibility assessment.

During such "applicant fraud" (in which the person realises, and subsequently believes, that it will be beneficial to craft a more favourable image of him/herself), a calculated effort is made to present a perceived (fictional) image based on the desire to "believe oneself", which will, for all intents and purposes, be a stronger desire than that of the fear of being "caught out" (by a polygraph examination). Their perceptions will relate to success in lying, and of feeling comfortable during the lie (as well as before and after), and would perceive the situation better dealt with by a lie than the truth [12]. People, it is submitted, have the inherent and covert capacity to present an "illusory self" in certain, specifically occupational, situations for their own benefit. When this motivation to conceal/deceive is stronger than the threat of having some deception exposed, polygraph results will be questionable. Recent studies in England and Wales have shown that almost two-thirds of adults interviewed (from all classes) admitted to committing minor fraud, but rarely think that their behaviour is criminal.

Sykes and Matza's (1957) concept of neutralisation is useful to identify the techniques that many shoplifters use to deny or deflect blame for wrongdoing away from the perpetrator. For example, shoplifters may claim that shoplifting does not really hurt the store very much (denial of injury caused) or that a particular store deserves to be ripped-off because they manipulate customers (denial of the victim). Such neutralisations allow individuals to redefine shoplifting as a more acceptable form of behaviour. Theft by employees is also extremely prevalent. The workplace has always been a key site of property crime. Indeed Gerald Mars wrote about the "normal crimes of normal people in the normal circumstances of their work" [13]. Mars contends that such "fiddles" are part of the suppleness of some occupations which emphasise individual entrepreneurship, flair adaptability, and professional autonomy, and in which group control of the workforce is low (academics, lawyers, journalists, sales representatives, etc.).

The conditions of work may unlock a criminogenic environment that opens opportunities and rationalisations for rule-bending and even rule-breaking [14]. It is expected that such people will report little guilt or effort during deceit and will control their behaviour to create an honest demeanour. By suppressing a memory or thought of previous infidelity or disconnecting themselves from a former deception and diverting their attention to another matter (e.g. the necessity of obtaining a job) when presented with a polygraph test stimulus question an examinee could redirect their salience and be adjudged truthful while the opposite is in fact the case. Handler, Shaw and Gougler sum-

marise the foregoing by stating that polygraph subjects appraise or evaluate polygraph test questions against some type of goal that is at stake, and that these assessments perform an arbitrational function for valence and salience of emotional and physiological response [15]. Similarly, Raskin, Honts and Kircher aver that, in general, people formulate goals, and use planning and self-regulatory strategies to in order to reach such goals [16]. Moreover, while some self-regulatory strategies occurs automatically and without conscious awareness or thought, other situations activate conscious, deliberate control of behaviour.

5. Behaviour Transmutation

Recall that polygraph theory dictates that examinees will experience physiological arousal to questions posed during the polygraph test based on the fear of detection of deception. Arousal to the most aversive stimuli, therefore, is, to the polygraph examiner at least, an indication of deception to either the control or relevant issue as the case may be. Herein lies polygraph's fundamental flaw. Polygraph theory does not take into account the fact that arousal to questions (control or relevant) can be caused by a multitude of different reasons. Even "innocent" responses such as stress and fear to endure a polygraph test, as well as anger, shame, colds, headaches, phlegmatism, and neurological muscle problems could also cause arousal during the polygraph procedure.[10] These authors also point out that individuals with a lack of conscience (e.g. antisocial personality disorder) will in all probability not be affected emotionally by polygraph questions and will, therefore, not show unique physiological responses. Consonant herewith some human attitudinal machinations and rationalisations used to camouflage bodily signals that can contaminate polygraph results are presented below as further evidence of polygraph's fear of detection of deception arousal contention imprudence.

5.1 Self-regulation

Self regulation theory is a social cognitive framework for understanding how people control their behaviour to steer away from undesired outcomes and towards desired goals. The desired goal for both liars and truth-tellers is to convince an interviewer that their statement is true. In general, people formulate goals, and use planning and self-regulatory strategies in order to reach desired goals [6].

While some self-regulatory activity occurs automatically and without conscious awareness or thought other situations activate conscious, deliberate control of behaviour. Psychological research shows that self-regulatory strategies are evoked by threatening situations, especially ones in which one lacks knowledge about a forthcoming aversive event. In line with self-regulation theory, it is reasonable to assume that liars and truth-tellers will view an upcoming polygraph examination as a potential threat - the threatening element being the possibility that one might not be believed by the examiner. Importantly, not knowing how much or what the interviewer knows may add to this threat.

A person attempting to avoid a threat and reach a particular goal will, under normal circumstances, have a number of self-regulatory strategies to choose from. The common objective of these strategies is to attempt to restore and maintain control in order to steer oneself toward the desired outcome [16].

5.2 Self-enhancement and Self-esteem

Self-enhancement is a very important topic in different fields of psychology, including (but not limited to) social psychology and personality psychology. It can be seen as a universal human characteristic, which nonetheless shows interesting cross-cultural differences. Self-enhancement can be seen as an "umbrella" term, related, among others, to such phenomena as self-esteem, narcissism, self-serving attribution bias, entitlement and so on.[6] Self-esteem refers to the positive (high self-esteem) or negative (low self-esteem) feelings that we have about ourselves. We experience the positive feelings of high self-esteem when we believe that we are good and worthy and that others view us positively. We experience the negative feelings of low self-esteem when we believe that we are inadequate and less worthy than others. Our self-esteem is determined by many factors, including how well we view our own performance and appearance, and how satisfied we are with our relationships with other people [17]. Self-esteem is in some measure a trait that is stable over time, with some people having relatively high self-esteem and others having lower self-esteem. But, self-esteem is also a state that varies day-to-day and even hour-to-hour. When we have succeeded at an important task, when we have done something that we think is useful or important, or when we feel that we are accepted and valued by others, our self-concept will contain many positive thoughts and we will, therefore, have high self-esteem. When we have failed, done something harmful, or feel that we have been ignored or criticized, the negative aspects of the self-concept are more accessible and we experience low self-esteem.

5.3 Maintaining and Enhancing Self-esteem

Although people can be quite good at creating positive

self-esteem by doing positive things, it turns out that we often do not stop there. The desire to see ourselves positively is sometimes strong enough that it leads us to seek out, process, and remember information in a way that allows us to see ourselves even more positively. Research has confirmed this general principle - people often attempt to create positive self-esteem whenever possible, even it if involves distorting reality. We tend to take credit for our successes, and to blame our failures on others. We remember more of our positive experiences and fewer of our negative ones. We emphasize our positive characteristics, and we may even in some cases distort information - all to help us maintain positive self-esteem.

5.4 Positive Response Distortion

It is reasonable to presume that when faced with the prospect of undergoing a polygraph examination, applicants will frequently be motivated to create a good impression, i.e., one they believe to be more favourable and appropriate in order to "pass" the examination [18]. Some individuals are likely to select and rehearse responses that reflect highly positive attributes, rather than providing factually accurate responses. This, according to Tooker, is known as positive response distortion [9]. Others could quite feasibly believe, at least temporarily, their own exaggerations resulting in the deception aspect thereof featuring less prominently in the persons psyche. It is then seen as a necessary lie, and does not invoke the same amount of fear of detection of deception during credibility assessment. It is submitted that this drive/competitiveness dulls the fear and perception of deception and the person becomes more positively engaged/driven by, for example, the anticipation of securing a position/job, than negatively charged by the lie/s that need to be told. The polygraph examination is likely to be laced with positivism not apprehension per se as the person's psychological set/atmosphere is entirely different to a situation where, for example, and by way of contrast, a criminal activity or serious breach of workplace fidelity is being investigated. The necessity of obtaining a job will override the fear that being caught out lying will hold for the individual, or at least this is the central thrust of this paper. Someone preparing for a job application polygraph will, in all probability, have a different mind-set/motivation to the one that is being subjected to a specific issue examination involving serious theft, or dismissible workplace impropriety. For example, a person who bolsters/exaggerates the truth is portraying his/her version of his/her competence and does not necessarily perceive this as lying, due to it being interpreted as the truth, although it could be exaggerated and tainted so to speak. They are accordingly, in their own minds, at

least, not lying per se. Quintessentially, the examinee is concluding that telling the complete truth about what they have done may be incompatible with the hiring preferences of the particular agency/company/institution to which he/she has applied. Positive response distortion thus arises when a person wants to present him/herself in a more favourable light – more favourable than what is true or actual. This would include "over-reporting basic virtues and underreporting faults".[19] Consonant with the foregoing, it is important to note that this form of response distortion is regarded as not always being conscious or a form of self-deceptive enhancement. It is in fact more recently, according to Pauhus and John viewed as form of bias, egoistic versus moralistic – in other words the person is intrinsically biased towards the positive aspects of him/herself and believes them to be accurate, making it very difficult to detect deception should such a person be subjected to a polygraph examination [19]. Egoistic bias relates to a person exaggerating social and/or intellectual status, while moralistic bias speaks to social harmony and claims of "saint-like" attributes and "exaggerated agreeableness and dependability" that are applied to present a more socially agreeable image of complying with perceived external social perceptions [19]. Any one or combination of these employed by an examinee could lead to a false positive or false negative finding in a credibility assessment test. According to Tooker, response distortion has been observed in job applications, completion of personal history statements, and during the pre-test interview of polygraph examinations, which are not unlike a job interview [9]. This means that an honest or dishonest person that exaggerates the truth would either get away with the deception or be labelled deceptive as a false negative/positive, either way the results will be flawed and a measure of victimisation will be present.

5.5 Self-preservation

Much like response distortion self-preservation is related to the notion of social desirability whereby a person presents him/herself in a manner he/she believes is most attractive to society at large. Both are related in their goal to present an image that is perceived desirable for the situation [9]. Self-preservation in the context of a person being subjected to a polygraph examination (who is inherently humble and timid) might want to present him/herself as respectful, yet bold and highly self-confident, i.e., more in line with the perceived attributes expected of them. In other words, self-preservation is the intentional capacity one has to convey those items in an image of him/herself, which he/she perceives meets the expectations or desires of the audience to whom the image is being presented [20,21].

This appears to be a perfectly acceptable mechanism to apply during a polygraph examination in order to "pass". The upshot hereof in the context of this paper is that a person feigning reality could fail or pass a polygraph erroneously due to the misaligned image they have of themselves generating a skewed polygraph result. In essence this form of behaviour adaptation involves the "overextension of factual information about oneself that may be false in order to protect the desired self-image", priming the applicant for exaggerated self-presentation during a polygraph examination [9].

5.6 Impression Management

When a heightened concern is placed on self-presentation, it subtly begins to bleed into the concept of impression management. Impression management is the (cognitive) process through which one manages information about his/herself so that he/she may be viewed in the way he/she would like to be viewed and can include elements of ingratiation [22]. Exaggerated self-preservation involves image projection that is not real, and in which incongruent (dissimilar/contrasting) beliefs are adopted [9]. It appears to not involve the extended adoption of incongruent beliefs, but only those with a transitory purpose, i.e., however long it takes to get through the polygraph examination - fleeting or situational appearance. Research by Carlson, Carlson and Ferguson (2011) found that impression management, as part of organisational behaviour, which includes job-seeking, likely embraces deceptive acts. These authors in fact postulate that motivation to enhance impression management with deception is strongly related to situations in which successful impression management is likely to result in substantial yield to the individual. By way of example, the stakes for desired jobs (as perceived by an individual) can be high and the motivation to exercise every possible advantage arise, to some extent from the limited availability and competitiveness for jobs, even in propitious economic times, crafting an enormously competitive market. The use of deception in impression management realises two specific possibilities, i.e., the applicant is a liar by nature or the applicant is only lying to get the job. Quite understandably there is deceptive practice, which is not desirable in a position of publicly and assumed integrity. However, as most things are proportional and can be viewed circumstantially, it beggars the question whether there is perhaps a degree to which lying is acceptable? It is quite possible, therefore, that even those individuals who are normally of a high integrity and honesty may engage in deception alongside those who do not adhere to these traits/ideals quite so much. In the case of the latter the lie is an instrument, not a character trait to gain something intensely desired. This manifestation of self-salience is, however, to be expected – the individual may perceive deception (temporarily) necessary to achieve his/her goal - a noble goal perhaps held by a noble person.

5.7 Narcissism

Although not intentional transmutation behaviour per se, narcissism is a personality trait characterised by overly high self-esteem, self-admiration, and self-centeredness. Narcissists tend to believe that they are more likable and attractive, have better relationships, and make better impressions on others than people with low self-esteem. But objective measures show that these beliefs are often distortions rather than facts. The self the narcissist imparts to the world is curated and edited, presenting their meant-for-the-public selves by only highlighting relevant parts, illuminating why the narcissist is blissfully unconcerned with being found out [23].

The current theory is that all of the narcissist's behaviors are unconsciously motivated and driven by a wound that fills her with shame and that she hides from the world; hiding that damaged part of herself leads her to self-aggrandize and exaggerate her talents, prowess, and almost everything else. Seen in that way, lies - or hiding the truth - are central to the narcissist's identity. Of course, she doesn't see it that way because all of her experiences are filtered through the hidden image; instead, she will see it as her truth. Someone who has Narcissistic Personality Disorder doesn't have the same kind of decency or basic morals when it comes to telling the truth. Narcissism is one of the personality disorders categorized as Cluster B - according to the DSM-IV and DSM-5) [24]. It is a mental condition in which people have inflated senses of their own importance, a deep need for attention and admiration, troubled relationships, and a complete lack of empathy for others. The narcissist is stripped of empathy, remorse and guilt. There is literally nothing to stop them from forming lies in their heads or actually saying them out loud. They lack the moral compass to guide them toward good and decent behaviour [24, 25]. It would, therefore, be naïve to expect the narcissist to experience arousal based on polygraph's fear of detection of deception doctrine.

Nothing is off-limits, especially when lying can serve their interests and if they think they can profit from omitting or altering the truth. In addition, the narcissist is thriving on drama, rejoicing when there is emotional chaos, and risking being caught is giving her even more motivation to craft a better, more artistically fabricated lie. They need to control what happens around them, who does what, who reacts how to their presence or absence.

Lies are ensuring them to stay in control, by making them seen better than they are, by altering the power dynamics and ensuring always the upper hand.[25] Also, lies allow escaping responsibility - which would cause any other decent human being to refrain from positioning themselves falsely. The narcissist knows that there are consequences to her actions, but she chooses not to be bothered about them in general. They refuse culpability by telling lies - small ones and big ones. The positive outcome from lying is so significant compared to any negative consequence, that they are compelled to lie frequently, so it becomes a habit [24]. They get so used to lying that telling the truth becomes the uncomfortable rare event making the establishment of emotional salience in preparation for a polygraph examination an almost impossible task.

Lying comes easily and they become so good at it, that it takes a very seasoned, unbiased and suspecting individual to spot it once it's told with utmost conviction. If the truth is not meeting the needs of the narcissistic, then there is nothing else to do but to modify it. The truth is a lot less important than their entitlement, their need for being loved, admired, and validated. At a certain point, they fail to see the world as it is, they only see it through their distorted perceptions - either letting go of reality completely or by choosing to see it in its fabrication [24]. Under such conditions it is highly unlikely that a psychological set will be established appropriately by a polygraph examiner (irrespective of his/her competence) and even more unlikely that polygraph results will be of any value.

6. Examiner Aptitude

When dealing with the establishment of emotional salience and the potential for human behaviour transmutation, the inclusion of examiner competence (read incompetence) further muddies the waters. The appointment of a polygraph examiner is usually based on service providers' marketing claims and pricing. The frequently polygraph illiterate consumer has little or no way of scrutinising the polygraph service provider's credentials and an appointment is usually based on "face value" or referrals. Polygraph examiners, on the whole, do not disclose their polygraph test charts to clients, and even if they did, the consumer would not know how to interpret them. There is thus, after the fact, no way of telling how good or not the tests were as the report and/or charts do not in any way reflect competence (to the untrained eye).

Consonant herewith, Raskin states that one of the major deficiencies with polygraph examinations is the lack of adequate training in physiology, psychology, and scientific methodology [26]. As a result many examiners are unaware of the basic principles of interviewing techniques with

regard to establishing the ideal psychological atmosphere for each subject, the sophistications and subtleties of question formulation, and their introduction to the subject and administration of the test. These problems indicate an oversimplified inattentiveness to the role of personality factors and effusive processes. According to Amsel, polygraph examiners must have the technical propensity plus a sense of pliancy in order to adjust and react to the continuously changing conditions of polygraph tests [27]. An examiner should have the same productive and successful interpersonal communication with a teenager as they do with an elder adult. They should be as sentient with an uneducated examinee as they are with a university professor or a CEO. Effective examiners must be able to adapt to a variety of topics and many different types of cases. Regrettably these are usually inherent traits which might not present in many examiners and is really something, besides not being taught, that cannot be taught. Anecdotal evidence suggests many polygraph examiners are merely "polygraph technicians" who rigorously follow protocol and operate a machine with a predetermined sequence – they display little discretion or flexibility as an essential commodity – realising application difficulties when dealing with unique individuals *in situ* and not merely "text book" actors [27].

These "technicians" follow a set of predefined, step-by-step rules and procedures dutifully despite the uniqueness of the situation or actual examinee. Even more distressing states Amsel, is the frequent lack of adequate training in the basic psychophysiology of the response measures and the interpretation of polygraph charts [27]. The failure to stay abreast of and use the best available techniques and the lack of familiarity or willingness to acknowledge (engage with) the scientific literature vis-à-vis accuracy rates and risks of errors has resulted in rash statements and flagrant mistakes. This can do great harm in both the criminal justice and public arena. Human beings are prone to making errors, however much we loathe doing so, and when we make them we feel bad about ourselves, and we look less than capable to the rest of the world. When polygraph examiners make mistakes, the results can sometimes be quite somber, even deleterious, for examinees.

7. Discussion

This article was designed to draw the reader's attention to the necessity of considering the context of human behavioural adaptation strategies in evaluating polygraph's claims that the establishment of emotional salience (with an examinee) will result in psychophysiological arousal when faced with aversive stimuli. The simple premise of a polygraph test is that when an examinee attempts decep-

tion, their state of physiological arousal will be altered. This argument is based on the successful establishment of emotional salience with the examinee and that he/she will be primed to psychophysiological arousal due to "fear of detection of deception". As shown above, this is a highly contentious assumption and one that can be regarded as truly fallacious.

There is no certainty about whether the emotional salience, required by the polygraph test, has in fact transpired as expected. Behavior adaptation, intentional or unintentional, plays a pivotal role in producing certain arousal, which in many cases will have nothing to do with whether emotional salience has been establishment or not. Nobody can claim, and there is certainly no evidence, that prevarication produces a unique physiological reaction. Autonomic activity is multi-determined, and the polygraph paradigm fails to control for alternative explanations for arousal as outlined in this article.

8. Conclusion

The foregoing exposition serves to disambiguate polygraph's contention that physiological arousal during a polygraph examination occurs solely due to fear of detection of deception embedded during the pre-test phase of the polygraph procedure. Polygraph examinations often foist people into situations that facilitate the invocation of necessity driven Machiavellian traits allowing them to, often effortlessly, skirt uncomfortable or potentially disadvantageous issues. Criminal justice agencies, industry and civil society alike, need to, henceforth, endorse a flexible process during diagnostic integrity endeavors, and not rely solely on vacuous polygraph results to make veracity decisions. It is crucial to realise that the human psyche is diverse and that people can execute adaptive strategies in the face of perceived challenges to goals, including responses in preparation for potentially harmful events. This review should be judged, not only on how it offers some food-for-thought, but more importantly by the questions that it generates paving the way, together with other literature on the matter, for future studies on polygraph theory and advanced scholarship in this contested space.

References

[1] Herbig, F.J.W. Polygraph Screening in the South African Workplace: Veracity Verification or Victimisation? Acta Criminologica, 2018, 31(1): 54-67.

[2] Kwiatkowska, A. How Do Others Deceive? Cultural Aspects of Lying and Cheating. Available at: https://www.academia.edu/33668285/How_Do_Others_Deceive_Cultural Aspects_of_Lying_and_Cheating, 2015(46-72).

[3] Hesselink, A.E., & Herbig, F.J.W. Polygraph Potential in South African Corrections: in Pursuit of Reform, Reintegration and Recidivism Reduction. Acta Criminologica, Special Edition, 2015, 2: 94-105.

[4] Lewis, J.A., & Cuppari, M. The polygraph: The truth lies within. Journal of Psychiatry and Law, 2009, 37(1): 85-92.

[5] Grubin, D. The Polygraph and Forensic Psychiatry. Journal of the American Academy of Psychiatry and the Law, 2010, 38(4): 446-451.

[6] Saxe, L. Science and the CQT Polygraph. A Theoretical Critique. Integrative Physiological and Behavioural Science, 1991, 26(3): 223-231.

[7] Reinach, L., & Louw, D.A. The Relationship Between Anxiety And Polygraph Results. Acta Criminologica, 2002, 15(3): 56-67.

[8] Memon, A., Vrij, A., & Bull, R. Psychology and Law: Truthfulness, accuracy and credibility, London: McGraw-Hill, 1998.

[9] Tooker, J.L. The relationship between integrity and personality in law enforcement applicants, 2012, Polygraph, 41(4): 209-220.

[10] Vrij, A. Detecting lies and deceit: The psychology of lying and the implications for professional practice, New York: John Wiley & Sons, 2000.

[11] Wallace, J. Lying. The Ethical Spectacle. (2000). Available at www.spectacle.org, accessed on 25 November 2019.

[12] Gozna, F. G., Vrij, A. & Bull, R. The impact of individual differences on perceptions of lying in everyday life and in a high stake situation. Journal of Personality and Individual Differences, 2001, 31: 1203-1216.

[13] Mars, G. Cheats at work: an anthropology of workplace crime, 1982, London: George Allen & Unwin Ltd.

[14] Carrabine, E., Cox, P., Fussey, P., Hobbs, D., South, N., Thiel, D. & Turton, J. Criminology. A sociological introduction. (Third edition), 2014, London: Routledge.

[15] Handler, M., Shaw, P. & Gougler, M. Some Thoughts about Feelings: A Study of the Role of Cognition and Emotion in Polygraph Testing. Polygraph, 2010, 39(3): 139-154.

[16] Raskin, D.C., Honts, C.R., & Kircher, J.C. Credibility Assessment. Scientific Research and Applications, Academic Press, Oxford, 2014.

[17] Tafarodi, R.W., & Swann, W.B. Self-liking and self-competence as dimensions of global self-esteem:

initial validation of a measure, Journal of Personality Assessment, 1995, 65(2): 322-342.

[18] Schmidt, J. A. & Ryan, A. M. The Big Five in personnel selection: Factor structure in applicant and nonapplicant populations. Journal of Applied Psychology, 1993, 78: 966-974.

[19] Detrick, P., Chibnall, J.B. & Call, C. Demand effects on positive response distortion by police officer applicants on the revised NEO Personality Inventory. Journal of Personality Assessment, 2010, 92(5): 410-415.

[20] Schlenker, B. R., & Weigold, M. F. Self-identification and accountability, in Impression Management in the Organization (Edited by Robert Giacalone & Paul Rosenfield), New Jersey: Lawrence Erlbaum Associates, 1989.

[21] Kassin, S., Fein, S., & Markus, H. R. Social Psychology (7th Edition), Belmont, CA: Wadsworth Cengage Learning, 2008.

[22] Snyder, M., & Copeland, J. Self-monitoring processes in organizational settings, in Impression Management in the Organization (Edited by Robert Giacalone & Paul Rosenfield), New Jersey: Lawrence Erlbaum Associates, 1989.

[23] Cai, H., Kwan, V.S.Y., & Sedikes, C. A Sociocultural Approach to Narcissism: The Case of Modern China. European Journal of Personality, 2012, 26: 529-535.

[24] Baumeister, R.F., Smart, L., & Boden, J.M. Relation of Threatened Egotism to Violence and Aggression: The Dark Side of High Self-Esteem, Psychological Review, 1996, 103: 5-33.

[25] Bizumic, B., & Duckitt, J. "My Group Is Not Worthy of Me": Narcissism and Ethnocentrism, Political Psychology, 2008, 29(3): 437-453.

[26] Raskin, D. Science and the Polygraph Profession. APA Magazine, 2015, 48(2): 25-28.

[27] Amsel, T.T. Where There is Doubt, There is Freedom. APA Magazine, 2015, 48(2): 32-34.

ARTICLE

Antecedents of Microblogging Users' Purchase Intention Toward Celebrities' Merchandise: Perspectives of Virtual Community and Fan Economy

Aoyi Yang   KyuJin Shim[*]

Faculty of Arts, School of Culture and Communication, University of Melbourne, Parkville VIC 3010, Australia

ARTICLE INFO	ABSTRACT

Over the last few decades, cross-fertilization between marketing and fandom studies in a mediated world has been rare, hindering the knowledge development for marketing practitioners in the Chinese fan economy context. The purpose of this study is to find and establish a conceptual framework that includes Online Interaction (OI), Parasocial Relationships (PSR) and virtual fan communities on *Weibo*, and how these contributory factors embedded in the interplay process of digital fandom practices in terms of enhancing fans' Purchase Intention (PI) and media consumption behaviours toward the celebrities' merchandise. Using an online survey instrument, this research collected 294 completed responses from fans who had online interactions with celebrities and engagement of virtual fan communities on *Weibo*. Key results and findings provided a clear framework of four antecedents based on the conceptual model and indicated that the high intensity of OI led to higher levels of the perception of PSR and the Sense of Virtual Community (SOVC). Increased PSR and the SOVC can be seen as significant positive predictors of the PI (a part of consumer identity construction as a fan) also. This study revealed the underlying mechanism of an emerging marketing genre, also provide useful implications of audiences' digital marketing practices for marketers, celebrities and policymakers.

1. Introduction

In recent years, fandom and participatory culture in China have evolved and well-operated successfully. It started with the phenomenon of online reality TV shows and the user growth of virtual fan communities' supports on social media. With *Idol Producer*, *Produce 101*, and other survival reality talent TV shows rapidly entered audience perceptions and grew in popularity, these new genres of shows take on different narratives

while providing viewers with an "unmediated, voyeuristic, and 'entertaining real'" [1,2], media figures of reality shows and fans communities gradually have created more intimate and two-way connections and have continued to evolve via audiences' active participation in online social media interactions [3,4].

Specifically, fans created a relationship similar to interpersonal, face-to-face "friendships" with contestants from reality TV shows, driven by direct address, personal and private conversational style of the media

*Corresponding Author:
KyuJin Shim,
Faculty of Arts, School of Culture and Communication, University of Melbourne, Parkville VIC 3010, Australia;
Email: Kyujin.shim@unimelb.edu.au

character's "authentic" personalities and problems on social media [5,6,7]. By such powerful interpersonal intimacy, media viewers even could feel celebrities as if they would be their real friends [6,7]. This kind of relationship between an audience and a media figure in terms of the developmental process can be defined as a parasocial relationship [5,6].

Social networking sites (SNSs) have narrowed the distance between the audience and media figures furtherly, have enabled celebrities to be influential endorsers of products, and have been shown to be a source of advice of their followers through these highly intimate, interactive and collaborative communications [5,6]. For example, *Produce 101* had drawn 90 million mentions and heated discussions on virtual fandom communities in the microblogging platform: *Weibo*, one of China's most prominent integrated SNSs [7]. And more than 40 well-known brands became involved in naming-rights sponsorships of this program or provided the endorsement marketing for the winning contestants [8].In short, fans' consumption behaviours have caused a significant rise in celebrity marketing volume, and "reality TV shows will continue to be a gateway for brands to reach consumers" [9].

These fandom practices also have made clear the links between Parasocial Relationships (hereafter, PSR) and its economic implications, and this phenomenon is described as fan economy [10,11]. In general, the fan economy refers to an revenue generating behaviour supported by the emotional and intimate relationship between celebrities and their followers. Kington explicated fan economy is a collective subculture that consists of viewers on the same media platform whose shared same interests serve as the basis of their communal identity, and this participatory culture prevails in wide commerce space [11]. Ford also explained that the fan engagement in the digital sphere could be incorporated in corporate logics and fit into models for monetization and measurement-in economic terms, stimulating wide-ranging emotional investment based on interpersonal relationships [12].

Previous fandom studies and relevant researches have explored fan economy in relation to audience commitment to the community. However, most published studies [10,11,17,19] mainly examined media consumption from the perspective of an individual fan thus it is needed to explore consumer desires from a group or community-based perspective in accordance to the new marketing environment [13]. Previously, main area of fan economy studies focused on the affective meaning of co-viewing and collective purchasing decisions that occur in fandom communities [13,14]. In short, it positioned fans as active consumers of cultural products influenced by online community-based media consumption and practices in unpredictable ways" [13].

In today's two-way community environment, fans are deemed consumers tightly bonded to celebrities and having an interactive and stable connection via PSR over long periods [15,16,17]. The role of a fan of PSR can be that of an *aficionado* or supporter via consumption practices, like buying the products endorsed by her/his admired celebrities [13,17]. PSR is therefore suggested as an effective theoretical framework to specify the link with reality TV celebrities and the fan economy [6, 18].

The fan economy in China can be further defined as the evolution of local cultural narrative of fandom. Specifically, in the digital environment, this term can be defined as fans' systematic practices of material consumption such as idols' products, and utilising emotional relationships with celebrity and social identification with fandom as the core marketing tools for e-commerce merchandising [10,18,20].Also aiming at the online fan community as the target segmentation to increase the corresponding purchasing intention and buying behaviours of the related products or brands of the celebrity [19]. The growing popularity of digital media propels to gain "emotional capitalism" [18,22], that means the transformation of conventional business models into a "business or marketing operation aimed at active fan communities that can offer lucrative business opportunities [21]". As such, emotional economy reflects enormous economic potential as a compilation and commercialization of true feelings, memories, and consumers' (fans') identities [21,22]. In brief, the fan economy is social network marketing based on affective economies in the virtual community around a particular brand or product of the celebrity [10,12,18,19].

Today, researches of fandom in a mediated world increasingly proliferate in the pages of academic journals and anthologies globally, but in an age of intensifying digitally-driven lives, when the popularity of celebrity endorsement hailing around the world, Chinese fandom practices commingle in widely accessible media, entertainment industries and marketing psychology, bring with them their own celebrity endorsement characteristics[10,18,19,93]. Driven by social shopping trends and capabilities from Asia, the first main difference is that the Chinese celebrity endorsement driven by digital fandom, in general, has always been an organic and bottom-up social experience [10,18,21,93]. It connects with fans' personal social networks and interacts with the fan community more [21,22]. And in second, increasingly Chinese companies and brands are seeking to go beyond "becoming friends" with their endorsers' fans groups for the sole

purpose of convincing them to willingly participate in brand activities and generate purchasing behaviours, which some western scholars describe as the morally reprehensible exploitation of fan labour [10,18,19,21,22,93,94]. And Instead, Chinese companies and marketers are increasingly embracing the creative powers of their endorsers' fan groups and are seeking interactive ways to nurture and maintain their fan community towards purchase intention and value co-creation [19,21,22,93]. If companies can match up with celebrities' needs, like provide some supports and endorsements opportunities during the reality TV shows, in a collective way through extensive interaction among community members fans will most likely be motivated by the parasocial relationships with the celebrity and to support and act on behalf of the company [10,18,19,21,22,93]. Thirdly, Chinese social network *Weibo* employs its three notable features have accelerated celebrity endorsement social shopping in China, allowing users to buy from both brands and individuals, with other fans and microblog users providing opinions on potential purchases [10,18,19,21,22,93].

Although parasocial relationship, purchase intention, and social media's celebrity endorsement (Facebook, Twitter, etc.) were often discussed in the previous studies, most studies related to these celebrity marketing tend to ignore how interactive participation of fans via parasocial relationship, and virtual communities affect the endorsement marketing. Also, they have not been incorporated in the context of fan economy which combined with the non-scripted, interactive and organic participatory setting of reality TV Shows [1,2]. Therefore, it is plausible to assume that the driving force, processes, and outcomes of an effective celebrity endorsement in reality TV and fan economy settings may be qualitatively different from the previous studies in other different cultural narratives. In this regards, we note the virtual "like-mindedness tribalism" on social media more comprehensively in relation to antecedents and the process that produce and influence the fan community; and how the Chinese digital fandom based on the virtual community facilitates two-way interaction with celebrities; also, how it promotes purchase intention of fans (identity as consumers). As of June 2019, there were 854 million Internet users in China, nearly threefold the population of the United State, thus, studies of planning for and implementing a business strategy for digital fandom embedded in celebrity endorsement on social media are crucial for capitalizing on the fan economy of brands.

Specifically, this study will explore and specify the relationships between celebrity marketing and the evolved fan economy, to fill the gap in previous studies on Chi-

nese digital fandom where parasocial relationship leads to emotional cultivation of community members. The purposes of this study include to 1) find and develop a conceptual framework includes underlying mechanism and driving factors behind online interaction with fan communities and celebrities on microblogging, what and how these related factors exert the process of fostering the unique fan economy-driven marketing in China. And 2) to understand the relationships among these driving forces; as well as how different factors were amplified by *Weibo* to influence fans' consumption activities toward the merchandise of a celebrity.

We believe this study can contribute to the Chinese entertainment industry and marketing practitioners with theoretical insight into fan communities, providing an additional framework to the existing literature that focus on the Chinese celebrity-following activities of endorsement effectiveness on microblogging platforms, as well as provide an effective endorsement or marketing communications through integrative emotional relationships analysis for marketing practitioners in other countries with different cultural narratives.

2. Literature Review and Hypotheses

2.1 Online Interaction (OI) and the Intensity of OI on *Weibo*

Social media has become ubiquitous in China and over 90 percent of Internet users in China have more than one social media account [23]. Online Interaction (hereafter, OI) can be built diverse kinds of internet-focused channels, like SNSs and mobile apps. This study focuses on OI as the intensity of following and interactive communication with celebrities, and frequency and the quality of involvement with digital fandom community not only accumulated time spent online on a specific social media platform [24].

Weibo (referred to as "Chinese Twitter") has reached a total of 486 million monthly active users by the end of June 2019 and gradually transformed from a simple microblogging platform to the biggest integrated SNS in China [25]. And notable features of *Weibo*, include 1) supporting interactive two-way communication with celebrities; 2) diverse and customized celebrities marketing strategies; 3) "Super Topics" (the specific function of *Weibo* that demonstrates equally shared hot debated subject online that help users to have real-time immersive communication with other like-minded members [27,29]) and thriving virtual communities [26].

Users' OI includes remarking of celebrity microblogger's posts; forwarding posts of celebrities to user's

page, sending private messages directly to a celebrity; instantly following or unfollowing a celebrity at any time [27, 28]. Particularly, the quality and frequency of commenting and continuing interaction with a celebrity can be indicators of celebrities' marketing power. If fans are interested in or attracted by the marketing messages on a celebrity's social media feed, they are likely to forward the post, which could snowball in user's community network, and subsequently boost the viral power and marketing impact of a celebrity [29].

Also, we note active engagement on virtual fan community as another vital indicator of the intensity of OI. Enthusiastic engagement with the fan community is promoted by diverse and convenient interface and features *Weibo* uniquely provides. To illustrate, "Super Topic" function helps people to gather and share all celebrity-related information in a collective and timely manner. A fan community grows into an integrated fandom camp developing group norms of agreed and obligated behaviours as users engage in online communities intensively and frequently to support their favourite media figures. And thus, the collective behaviours and norms aiming at supporting the same media celebrity eventually lead to sense of belongings and mutual trust based on community membership [30,31].

2.2 Parasocial Relationships (PSR)

The concept of Parasocial Relationship (hereafter, PSR) was first introduced as Parasocial Interaction (PSI) by Horton and Wohl [8]. PSI refers to an audience's emotional attachment to and feeling of intimacy with a media figure on the screen. In general, the terms PSI and PSR can be used interchangeably to characterize an emotional connection between media figures and audiences [32]. Cole and Leets distinguished PSI as a momentary behaviour from PSR that emphasizes continuum of an audience's social encounters with celebrity on screen [32]. In this sense, this study employed the term PSR, focusing on the sustained interaction and deep emotional engagement between users and the celebrity rather than instant attempts [6]. The previous study found that repeated viewing and accumulated knowledge about the celebrity will increase PSR, in this context, audiences will rely on one's own subjective interpretation in order to achieve a full understanding of celebrities' behaviours and to identify the relationship with celebrity and thereby they pursue pleasant feeling from the PSR [34,35]. Hence, such influential and emotional bonds will even lead the audience to seek essential and useful information from celebrity or media characters [33]. Ballantine and Martin also argue that a robust PSR can have a significant impact on

followers' cognition, attitudes, and behaviours towards the celebrity or idol. [36].

Past scholarship has examined how intensity of OI influence the forming and maintaining PSR, which were substantially supported by communication and media scholarship [37]. To illustrate, Labreque found that online interactivity is an antecedent of forming PSR [38]. Further, Chung and Cho proved that SNS use had a positive effect on the perception of PSRs' subordinate factors [3]; Yuksel and Labreque also argued that the perceived PSR also could be enhanced by frequency and quality of interaction with celebrity via social media [39]. The above view also gained much support in the context of Chinese contemporary media landscape. Gong and Li's research on online activities about celebrities on *Weibo* indicates that the intensity of OI could facilitate the perception of PSR [28]. Ding and Qiu also stated that the strength of interactive online activities with virtual community members on the *Weibo* have positive impact on perception of PSR [24]. In summary, the previous literature demonstrated that in the most circumstances, the more frequently people have interaction with celebrities, the more it forms and increases the perceived PSR. Thus, the following hypothesis is predicted:

*H1: Intensity of **Online Interaction** (OI) has a positive association with the perception of **Parasocial Relationships** (PSR).*

2.3 The Sense of Virtual Community (SOVC)

A virtual community refers to an online social network which provides the access for users to have an interactive connection via digitally mediated communication beyond the limitations of corporeal presences in a shared physical space and the dimension of time [40,41].

The SOVC can be defined as members' emotional connection with others in terms of membership, identification, belonging, obligation, agreement and exchange of support through OI [40]. The features of SOVC contain three "basic disciplines" of community dynamics: anticipated reciprocal membership; mutual influence (including expression norms and practices norms); intimacy and trust [42]. Hence, SOVC can be seen as a fundamental bond and norm enforcement metric of a virtual community [40,41,43].

Furthermore, some participatory culture studies noticed that for many virtual fan communities, SOVC will enhance emotional investment in a collective way through extensive interaction among community members [43]. Booth also focused on individual fan's emotional contribution as well as collective contribution to the community as a critical aspect in the formulation of the

active SOVC [17]. For example, members are prone to build emotional attachments with idols and celebrities they are following on *Weibo* via participating in votes to increase celebrity's popularity rankings on various social charts [30]. Specifically, members take several steps as a daily routine to raise social rankings of their star such as online votes for a celebrity or idol on various social charts, or checking-in on the fan page of *Weibo* [30].

Since virtual fan groups are extremely close-knit communities where members have direct and intensive real-time communication with each other [41,44], members can settle in virtual territory, subsequently thus SOVC endures. [45]. As such, intensity and frequency of social media use have been found to increase SOVC in previous studies as well [46,47]. Thus, we formulate the following hypothesis:

H2: Intensity of Online Interaction (OI) has a positive association with Sense of Virtual Community (SOVC).

SOVC and PSR

It also should be noted that perception of a higher SOVC is presumed to facilitate community attachment and indirectly affect the perceived mutual relationships among followers and celebrities on social media because virtual community enables an alternative access to a media figure [48,49]. Ballantine and Martin also emphasize the correlation between perception of PSR in the digital environment and perceptions of the SOVC in the context of fannish culture [36]. With continually participating in online community a fan's desires to have a personal and emotional relationship with their idol will be amplified [30,49,51]. "Fan culture" tends to solidify into affective bonds with unmet celebrity based on PSR and emphasize "obliged" practices through the SOVC [30,49,50,51]. The following hypothesis is, thus, put forward:

H3: The strength of Sense of Virtual Community (SOVC) will positively affect the perception of Parasocial Relationships (PSR).

2.4 Purchasing Intention (PI): Consumer Identity Construction as a Fan

Purchase Intention (hereafter, PI) refers to a part of consumer identity construction as a fan considering celebrity marketing targeted at followers who wish to support their favourite celebrity or purchase the same product with celebrities or idols. PI can be defined as a measure of the strength that consumer tends to buy a certain product or service in certain condition [52,53]. Some factors such as a choice of channel preference, information collection, previous experience and expected benefit or costs from the external environment will have a significant impact on the complex information filtering and

decision-making process of a consumer [51,52,53,54,55]. And PI can be a crucial measure to foresee actual buying behaviours [52,53,54]. It also can be seen as a parameter which can be used to reveal characteristics potential consumers beyond active consumers as measuring intention does not have to involve the actual consumption practices [55]. Previous literature also revealed some significant factors behind purchasing intention by examining how consumer identity is constructed via seller-buyer interaction [55,57,60,63,].

2.4.1 The PSR and PI

Numerous empirical researches have attested that the perception of PSR with celebrity will have the tangible effect on PI because PSR will result in attitude change of the consumer toward the specific endorsed product or brand [56]. For example, Yuksel and Labreque found that PSR could influence the consumers cognitively and affectively [39] Also, the relationship between PSR and increased PI is found to be mediated by other factors such as social media interaction; to be specific, Chung and Cho suggested that PSR between SNS users and media figures could increase the effectiveness of a celebrity as a brand ambassador and thus help consumers to purchase the brand [3].

In the same vein, some researches in the context of Chinese virtual community argue that PSR can promote follower's endorsing a brand that corresponds to celebrity marketing [3,24,28,86]. Therefore, it is evident that the high-level of follower–celebrity PSR would result in the high possibility of acceptance of a celebrity's social media marketing from a follower which in turn, increases purchase intention [24, 28].

Taking that perspective, the study will test the following hypothesis:

H4: The perception of Parasocial Relationships (PSR) has a positive impact on Purchase Intention (PI).

2.4.2 The SOVC and PI

The SOVC enables each member to establish trustworthiness, group norms and social identification [36]. And group norms and social identity are the two significant factors in consistent virtual community participation and practices [42, 57].

Chung stated that online communities often require and promote self-identification process through representative digital symbol such as an avatar. Visually pleasing images or graphic symbols are often useful to stimulate the consumption intention and buying behaviours [58]. When online users' information can be collected easily

by group norms, community messages, and through trace of behaviours, a virtual community can be solidified by royal and regular fans and users. [21,31,40,59]. Moreover, users are inclined to buy or have recommendations of products mainly to share the same fannish identity [30,40,60]. The communities with highly shared social identity and group norms are more likely to be influenced by celebrity [59,61]. If a celebrity-endorsed product meets the need of fan community that shares the same value and norms, community members whose identities are developed as both a fan and consumer may hold unique psychological social identity associated with the product, which potentially raises PI [41,58,62].

The SOVC in a Chinese fan community narrative can be seen in the affectional bonds that carry on member-generated content that involves themes of higher trustworthiness, relatedness, and communication interactivity [30,63]. More and more internal rules and customs to regulate fan practices were established by virtual fan communities on *Weibo*, which sometimes imposes and dictates specific forms and meanings of fan participation. More importantly, SOVC can obligate repetitive buying behaviours by way of excuse to support idols' career or to boost celebrity image [30,64]. And sometimes, interactive discussions happening within virtual communities can even persuade fans to become the "excessive consumers" [18,41].

Thus, this study suggests the following hypothesis:

H5: The strength of Sense of Virtual Community (SOVC) has a positive impact on Purchase Intention (PI).

3. Methodology

3.1 Procedure

For analysing the interrelationships between microblog users' intensity of OI, their perceptions of PSR with the celebrity, and the SOVC of fans and their purchase intention, this paper designed and conducted an online survey embracing scales to measure these four constructs and some other simple demographic variables. This survey research was hosted on WJX (https://www.wjx.cn), one of the biggest and leading research and experience website in China, currently, WJX has finished 27,003 online human-intelligence survey projects [65]. We chose this platform to collect data through random sampling that has representative power of the total population of fans on the virtual fan community of *Weibo*. An invitation message with a link to the online questionnaire was posted in affiliated discussion forums of WJX.com, the Facebook/Twitter/WeChat groups of Chinese Students and Scholars Association (CSSA) of The University of

Melbourne, and the top 100 "Super topics" of celebrities on *Weibo* for two weeks, since we also consider its professionality they provide that ensure the reliability and validity in determining the quality of survey information, more so than a homogenous sample of university students [67]. Participants were informed that the data captured in the survey was going to be used for academic purposes. Screening questions are used to ensure that all the respondents are active users of the "Super topics" function on *Weibo*. For example, we set up the question like "Who is your favourite celebrity that you followed and joined his/her Super topic on *Weibo*"? We deleted the respondent if their answer is none [24] [67]. To qualify, the respondents had to be adult fans (at least 18 years age or older) and identify and participate in a virtual community of his or her favourite celebrity of *Weibo* (on the "Super Topics" top 100 list) [26]. Moreover, to ensure that the respondents are experienced virtual community users, and to avoid uncontrollable variables of the "new user" bias, only those who had engaged in and have been the active member of virtual celebrity communities for at least six months on *Weibo* were recruited (we also have examined their interactive activities with other users of virtual fandom communities through checking their IDs on *Weibo*) [24]. The survey instrument took about 10–15 minutes for participants to complete. And after finished this online survey, respondents were to be paid 5 yuan as a token of gratitude.

3.2 Participants & Sample

A total of 340 respondents received the invitation to the survey over the two weeks. At the end of data collection, it turns out 297 out of 340 completed the survey, resulting in a completion rate of 86.5%. The gender of respondents consists of 171 male (58.2%) and 123 female respondents (41.8%).

And according to the social media users' profile in China [66], respondents were asked to indicate their ages within one of six categories. The age of the sample somewhat with the trend of lower-aged, most of the participants are Centennials (birth year from the mid-1990s to mid-2000s) and Millennials (the early 1980s as starting birth years to mid-1990s). Population with 140 respondents (47.6%) in the 18 to 25 years old range; 82 of them (27.9%) between 26 to 30; 68 of them (23.1%) between 31 to 50; and 23 are belonged to (1.4%) 50 and over. And over half of them had at least the high school degree or went to college. Ninety-eight of them are less than bachelor's degree 33.4 %, and even 37 of them (12.6%) had advanced graduate or Ph. D. degree. The two main income categories are $400-$800 (33%) and

$800-$1200 (31%), following by less than $400 (22.8%). The disposable income they also get not vary a lot from a different category, and overall are higher than the average monthly wage in China.

In terms of the average *Weibo* usage frequency and time, 48.8 percent of them stated they would have multiple OI within a day (above five times); and 36.7% of them chose to have *Weibo* usage activities only twice or three times every week. For the use time, almost 80 percent of respondents had averaged at least 30 minutes and maximum to 3 hours usage time on *Weibo* every day.

3.3 Measurements

In this study, the self-report instrument included four main category scales with 27 questions to measure the critical interval variables. Some items of the survey were adapted from pre-validated studies to improve the construct validity of the research. Responses to this instrument were all recorded on five-point Likert scales (1 = "strongly disagree"; 5= "strongly agree") [67]. Those scales include:

The intensity of online interaction scale was adopted from the scale of Facebook uses intensity developed by Ellison et al. [68], with some items created by the author based on the description of the OI on fan communities of *Weibo*, with a total four items [30].

The parasocial relationships scale was adopted from the previous research of local television news viewing that developed by Rubin and Perse [69], and Rubin and Perse's shortened version ten items about audiences' involvement activities with media persona [6]. Besides, some items were adjusted and modified based on the description of the usage of celebrity-following activities on *Weibo* as well [24]. A total of eight items were conducted to assess the different sub-constructs of the PSR, such as friendship (e.g., "*My favourite celebrity's microblogs make me feel comfortable, as if I am with a friend*"), identification (e.g., "*If I saw a story about my favourite celebrity in different media channels/platforms, I would watch it*") etc. [6,24,69].

The scale of the sense of virtual community consisted of a total 11 items that adopted from previous study by Blanchard and Burnett, G., Buerkle. [31,42]; and scales of a comparative study of the virtual community [70]. Also, Koh, Kim, & Kim's three valid dimensions such as membership (e.g., "*Members of this community can be counted on to help and support each other*"), influence (e.g., "*I would like to follow and support the decisions and behaviours that most members agreed in the community*"), and immersion were adopted. (e.g., "*I contribute a lot of time and effort to this fan community*") [71].

The purchase intention scale includes four items that were adopted and adjusted from Koo and Ju's emotions and online purchase intention scales [72].

AAdditional questions were asked about participants' basic demographics and average time spent on *Weibo* and frequency of usage. All the details of measurement items are listed in Appendix A.

Given the fact that the four constructs were measured at the single same time and reported by the same respondent an additional threat to our study could have been a common method variance (CMV) [91] [92]. To prevent and minimise CMV, in the questionnaire we placed the dependent variables after the independent ones [91]. And the study also relied on the following statistical procedures: (1) to analyse the correlation matrix between the different constructs, and the results show that none of the values of the correlations between constructs surpasses the suggested threshold (i.e., r=.90) [91,92]. (2) To evaluate if CMV influences results, this study adopted Harman's single factor as post approach to evaluate CMV in which all the 27 items from four constructs were entered into the Exploratory Factor Analysis (EFA). A problem of common method bias can be identified if either a single factor emerges from the EFA or general factor accounts for the majority of the covariance among the 27 items [91,92]. Thus, EFA was performed, four factors accounting for 66.95 per cent of the variance, and the first factor accounted for 21.34 per cent of the variance. The results indicated that the model passed the Harman One Factor Test as there is no single factor occupied the majority of that variance [91,92]. In summary, all the different applied procedures to test for CMV suggested that is not a threat to the result of the study.

3.4 Results

This study examined the measurement model, the structure of the conceptual model, and each hypothesized path using structural equation modeling (SEM), since SEM allows to examine and confirm the relationships between observed and latent (unobserved) variables [73]. In so doing, this research used AMOS 24, which performs a path-analytic modeling with latent (unobserved) variables [74]. Figure 1 shows the whole conceptual model and the results of SEM analysis process.

The suggested conceptual model has four latent variables: OI, SOVC, PSR and PI. And understanding the relationship and role between these various latent variables is the key to the initial model and is also a crucial step in finalizing the structural model [76]. The AMOS 24.0 was used to perform the following initial SEM model to lay the groundwork for further empirical verification. We

also established and examined a measurement model to examine the relationship between each latent variable and its observed variable (items in the survey instrument) [76,77]. And we combined the conceptual model with several research hypotheses and related precautions in the initial model construction.
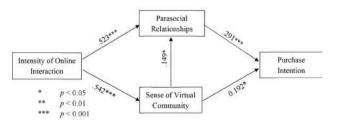

Figure 1. The Results of SEM Analysis

First, the convergent validity was tested by Confirmatory Factor Analysis (CFA). The results are presented in Table 1. It can be seen that Cronbach's alphas were all greater than 0.7, indicating that each variable has good (> 0.79) or excellent (> 0.89) convergent validity [78,79]. Besides, the value of AVE was greater than 0.5, and the AVE square root number of each factor was larger than the normalized correlation coefficient outside the diagonal line, revealed all variables have a good discriminant validity as well [80].

Table 1. Evaluation of the Measurement Model

	Cronbach's Alpha	AVE	√AVE	OI	PSR	SOVC	PI
OI	0.912	0.719	0.848	1			
PSR	0.922	0.59	0.768	.560**	1		
SOVC	0.934	0.61	0.781	.496**	.449**	1	
PI	0.829	0.551	0.742	.414**	.453**	.407**	1

Note: ** P < 0.01

Second, we tested the approximate goodness-fit-indices of this model, the Chi-square statistics for the conceptual model (χ^2(665) =901.562, p < .001; df =488; CMIN/DF (χ^2/ df) =1.847, the ratio of minimum discrepancy divided by its degrees of freedom closes to 1 and not exceed 3 [81]; But according to Bollen and Long, since the chi-square statistic (χ^2) is sensitive to sample size it is necessary to look at other model fit indices that also support goodness of fit (e.g., CFL, TLI, RMSEA) [82]. All alternative indices were in line with the acceptable research standard as well: TLI, IFI, and CFI were all above 0.9; AGFI =0.842, GFI =0.819, all greater than 0.8; and RMR =.061, less than 0.08; The RMSEA = .054, less than .08. [76,77,83,84]. Thus, these indices revealed an acceptable fit for the research model.

The final step was to examine each hypothesized path's significance [76]. As Table 2 and Figure 1 showed, all the paths in the research model were significant at either. 001 or .05 level. Specifically, the intensity of OI had a significant positive effect on the perception of PSR (β=0.523, *p* <0.05), thus, the H1 was supported; the intensity of OI had a positive association with the perception of SOVC (β=0.542, *p* <0.05), hence, the H2 was supported; the perception of SOVC had a positive impact on the perceived PSR (β=0.149, *p* <0.05), thus, the data supported H3; the perception of PSR has a positive impact on PI (β=0.291, *p* <0.05), thus, the H4 was supported; Finally the perception of SOVC has a positive association with PI (β=0.192, *p* <0.05), hence, the results support H5.

Table 2. Path Coefficient and Results of Hypothesis

Path			Standardized estimates	Unstandardized estimates	S.E.	C.R.	*p*	Result
PSR	<---	OI	0.523	0.426	0.054	7.836	***	Supported
SOVC	<---	OI	0.542	0.49	0.059	8.328	***	Supported
PSR	<---	SOVC	0.149	0.135	0.056	2.39	0.017	Supported
PI	<---	PSR	0.291	0.26	0.061	4.29	***	Supported
PI	<---	SOVC	0.192	0.155	0.057	2.723	0.006	Supported

Note: *** p < 0.001

To conclude, the collected data support the conceptual model the study suggested, which indicates that higher intensity of OI has a positive effect on the perception of PSR and OVC. Therefore, PSR and SOVC are found to be two significant predictive factors of PI. It also revealed that PSR and SOVC may have contributed to the increase of PI. Discussion and implications of the results are presented below.

4. Discussion

Over the last few decades, cross-fertilization between marketing and fandom studies in a mediated world has been rare and hindering the understanding of practitioners on the entertainment industry and marketing area. In the past, purchasing a product influenced by celebrity's endorsement toward a brand was considered a cognitive process based on the strength of the perceived credibility of celebrity [3,56,86]. Or it could be perceived as the conception of celebrities' self-disclosure [3,27,28]. However, this research shows the relational social networks of

group's participatory engagement could possibly induce positive marketing effects by two-way communication online beyond top-down celebrity-dominant marketing mechanism.

Specifically, another value of this study to the marketing practitioners lies in extending the knowledge about the fan economy and building related academic framework including: (1) explores what impacts the newly arising fan economy has, particularly on celebrity effect on followers' purchase intentions and specify the links between an emerging celebrity marketing genre based on evolved Chinese fannish behaviours driven by the OI and PSR; and (2) allows industry practitioners and celebrities to connect with fans and virtual fan communities and to analyse integrative emotional relationships in digital era; thus (3) build a theoretical framework through which fans, practitioners, other researchers, even policymakers can reflexively examine particular marketing and consumption practices.

Overall, the key results in this study provided a clear framework of four antecedents of Chinese fans' purchasing intentions toward the merchandise of a celebrity. Firstly, the high-level intensity of OI led to fans' increased perception of PSR and SOVC, it illustrated the increasingly important role of social media, more specifically, the *Weibo* can be seen as a significantly integrated vehicle of Chinese digital fandom in the context of the fan economy.

Secondly, the strengthening of SOVC has a positive association with the perceived PSR of fans, it revealed that the engagement of virtual community helped to break the wall between the fans and celebrities, and resulted in motivating fans to have OI with their favourite celebrity in a more emotional, understandable, interactive and identifiable way.

It is also demonstrated that the emerging pattern of media experience such as interactive communication with the celebrity and members of virtual community on *Weibo*, has a substantial economic impact to increase purchasing intention toward the celebrity-related products or endorsements. Most importantly, fan economy in China pursues deeper emotional PSR with celebrities and likemindedness among members of virtual community to lead to consumption behaviours, which is also encouraged by the interactive digital fandom practices.

Besides, this study indicated that virtual of fans communities on Weibo can enhance the perception of PSR, which extends the knowledge about the digital media users' psychological bonding process. Notably, this research found the synergy effect of PSR and the SOVC in increasing the marketing power of celebrity to fans as

consumers who tend to take solid emotional bond with celebrity into consideration when purchasing an item.

In addition, the mechanism and conceptual framework enriched our understanding of how celebrity marketing works especially in China-net context. To note, community members will observe and repeat communal practices attached to one's alter ego or online self which is isolated from real-life identity. Also, they have a desire to develop the group norms and stimulate mutual commitment (such as collective purchasing the products related to the celebrity).

By confirming silent economic effect of virtual fan communities related to the celebrity marketing power, this study can encourage future research opportunities across various disciplines. Future research can delve into community-centered relationships that enhanced previous findings from fandom studies. Also theoretical framework might have to explore the link between emotional identification with group membership and fans' media consumption, which akin to, Kyu and Oh's on online congruence seeking behaviour via online platforms [85].

On a practical and managerial level, this article has significant implications not only for the marketing practitioners but also for celebrities themselves. First, the use of the celebrity endorsers on SNSs will be employed by marketing practitioners as an emerging marketing genre and transitional business model using social media in China. Also, sheer number of virtual fan groups and their media consumption behaviours critically increase marketing value of community, as members carry massive purchasing power in response to marketing campaigns and promotions. Thus, the marketing professionals and celebrities need to foresee the superior viral marketing power through emotional connections with fans. To note, practitioners should keep in mind that fan economy is forcing an urgent rethink of marketing strategy as traditional and typical marketing communications tend to play a subtle role in this process. If marketing intention is too explicit as to overshadow fans' genuine and authentic engagement with the campaign message, promotion might backfire as fans might be discouraged or feel being mobilized. Therefore, practitioners are suggested to infuse authenticity into interactive marketing communications thereby draw attention through gaining organic traffics to community sites.

Meanwhile, this study can enlighten industry policymakers as to apply regulate various type of viral or celebrity marketing practices. Related industry policy-makers should take note of ethical issues that might arise from celebrity-influence on marketing as the nature

of fan economy often incites blind and indiscreet following and impulse buying. Therefore, practitioners should well understand the tenets of virtual community and its possible repercussions to protect consumers from misleading and "over-exploitation" by marketers[86].

Last but not least, appropriate media education should be offered to protect the adolescents or younger generation who are still developing their skills for informed decision making.

5. Limitations and Future Research

Several certain limitations of this research are worth noting. Firstly, the survey instrument adopted voluntary response samples of *Weibo* users who identified themselves as fans of particular celebrities and participated in relevant virtual fan communities. Additionally, the intervention of voluntary responses tends to oversample online users who have extreme opinions and specific attitudes toward this topic, and thus may not be the best representative group of the research population.

In terms of the research methodology, this study took quantitative approach therefore, future research can complement this study's key argument with qualitative research methods, such as focus groups and in-depth interviews that can provide a more thorough understanding and different angle about fan economy. Hence, future studies can benefit from a longitudinal approach which could determine and track these variables and assess if they are formed a consistent and stable status of potential purchase pattern toward the merchandise of a celebrity [89].

Additional studies could also consider investigating different social media platforms concerning this study. While this study mainly looks at *Weibo* as a social media platform for fan community future studies might be able to examine other SNSs as a powerhouse of virtual communities. Also, it would be valuable to explore the dynamic interplay between online and offline in the context of fan economy. While fan studies tend to focus on digital platforms and emerging media channels, offline areas are still integral to fan studies. Future studies can uncover how members react and defy the norms and duties subtly and conventionally imposed within fandom [32], while exploring diverse perspectives towards fandom culture across disciplines and media types [12].

6. Conclusion

Ceaselessly changing digital landscape extended the areas of interactive marketing. Fan economy has gained prominence over the past decade, mainly owing to grow-

ing virtual fan community in social media and extensive fandom culture. Two-way communication and interactivity online massively increase the power of fan economy using celebrity marketing, yet it poses potential risk of viral marketing as well. Therefore, both practitioners and researchers should pay more attention to track the progress, success, and engagement of fans with virtual community on social media.

Supplementary Data/ Information

Appendix A: Online Survey Instrument

(1) The real online survey will contain the plain language statement, consent form and the statement of protecting their privacy and confidentiality. Also, the details of security and storage of the data collection.

(2) All materials will be translated Chinese for the convenience of the most participants. And respondents also can choose the language option (English or Chinese) of above information by themselves.

If you are interested in the outcomes of this study, you can leave your e-mail address, the student researcher will send the invitation e-mail link of key findings of this project. Or any participant who would like to learn of the results of the study can contact aoyiy@student.unimelb.edu.au & kyujin.shim@unimelb.edu.au for copies of any reports.

Thank you for agreeing to participate in this survey. For planning purposes, participation should take approximately 10 to 15 minutes of your time. By continuing, you are indicating that you are over the age of 18, and have more than three months experiences of online interaction (OI) with the celebrity as well as the engagement of at least one virtual community related to your favourite celebrity on "Super Topics" list on *Weibo*, also, you wish to participate in this study.

PART A 1. Background Information/Demographics

1.1 Who is your favourite celebrity that you followed and joined his/her Super topic on *Weibo*? (Please list at least one celebrity_____)

1.2 What is your gender?

□ Female

□ Male

□ Other (specify_____)

1.3 Which category below includes your age?

□ 18-20

□ 21-25

□ 26-30

□ 31-40

□ 41-50

□ 50 or older

1.4 What is the highest level of school you have completed or the highest degree you have received?

□ Less than high school degree

□ High school degree or equivalent (e.g., GED)

□ Some college but no degree

□ Associate degree

□ Bachelor's degree

□ Master's degree

□ Advanced Graduate work; Ph.D. or Others (_____)

1.5 What is your current disposable income or status? (Australian Dollar)

□ Less than $400

□ $400-$800

□ $800-$1200

□ $1200-$1600

□ More than $1600

PART B. Measurement Items of the Study

1. The Purchase Intention (PI)

Directions: Below are several descriptions of how you may feel of your *Weibo* usage activities and online social interaction. Please use the scale below to rate the degree to which each statement applies to you by marking "√" in the space of right of each item based on the following Likert 5-point scale:

Strongly Disagree Disagree Neutral Agree Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |

Dimesons	Measurement Items	Degree				
Purchase Intention [1]	It is likely that the artwork of my favourite celebrities and the products they endorsed would be my first purchase choice without hesitation.	1	2	3	4	5
	I would like to purchase the products of celebrities that recommended by the online fan community.	1	2	3	4	5
	I will recommend others to purchase the artworks of my favourite celebrities or the brand he/she endorsed.	1	2	3	4	5
	If someone let me recommend something, I would like to introduce the products related to the celebrity I like.	1	2	3	4	5

2. The intensity of Online Interaction (OI), the perception of Parasocial Relationship (PSR) and the strength of Sense of Virtual Community (SOVC)

Directions: Below are several descriptions of how you may feel of your *Weibo* usage activities and online social interaction in the virtual fan communities ("Chaohua"). Please use the scale below to rate the degree to which each statement applies to you by marking "√" in the space of right of each item based on the following Likert 5-point scale:

Strongly Disagree Disagree Neutral Agree Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |

Dimesons	Measurement Items	Degree				
Online Interaction [8,9]	I often to share my views and opinions in the fan communities.	1	2	3	4	5
	I always participate actively in the discussion of topics related to adored celebrities and response to other members' posts of the fan community.	1	2	3	4	5
	I often have interactive communications with other members in the fan community.	1	2	3	4	5
	I often review, forward and remark the microblogs of my favourite celebrities on *Weibo*.	1	2	3	4	5
Parasocial Relationships [2,3]	I see my favourite celebrity as a natural, down-to-earth person.	1	2	3	4	5
	If I saw a story about my favourite celebrity in different media channels/platforms, I would watch it.	1	2	3	4	5
	I would like to meet my favourite celebrities in person.	1	2	3	4	5
	I feel sorry for my favourite celebrities when they post some "inappropriate" microblogs.	1	2	3	4	5
	I miss seeing my favourite celebrity when they do not post new microblogs on *Weibo*.	1	2	3	4	5
	I will worry about my favourite celebrities when he or she is ill.	1	2	3	4	5
	My favourite celebrity's microblogs make me feel comfortable, as if I am with a friend.	1	2	3	4	5
	I find my favourite celebrities to be very attractive	1	2	3	4	5

Sense of Virtual Community [4]	I feel proud of as a member of this virtual fan community	1	2	3	4	5
	I contribute a lot of time and effort to this fan community	1	2	3	4	5
	It is very important to me to fit in and truly become a part of this community.	1	2	3	4	5
	I care about what other community members think of my actions.	1	2	3	4	5
	I feel obligated to observe the values, norms and commitments of this community.	1	2	3	4	5
	I would like to follow and support the decisions and behaviours that most members agreed in the community.	1	2	3	4	5
	I have positive influence over the discussion of my favourite celebrities.	1	2	3	4	5
	I think my efforts can enhance the development of the community.	1	2	3	4	5
	The information in community will have impact on me.	1	2	3	4	5
	Members of this community can be counted on to help and support each other.	1	2	3	4	5
	I am full of hope for the future development of the community.	1	2	3	4	5

PART A 2. Background Information/Demographics

1.6 How often, on average, do you spend on *Weibo* to have OI (includes check his/her websites; retweet or comment of their posts) with your favourite celebrities each day?

□ Multiple times a day

□ Twice or three times every week

□ Three or five times every month

□ Other (specify_____)

1.7 How often, on average, do you spend on the virtual fan communities of *Weibo* to have OI with other members each day?

□ 30 minutes-1 hour

□ 1-3 hours

□ 3-4 hours

□ 4-6 hours

□ More than 6 hours

Appendix B: Consent Form

The School of Culture and Communication/Media and Communications Department/ Faculty of Arts

Project: Antecedents of Microblogging Users' Purchase Intention Toward the Merchandise of Celebrities: The Perspectives of Virtual Community and Fan Economy
Responsible Researcher: Shim, Dr Kyujin
Additional Researchers: Aoyi Yang

References

[1] Murray, S., Laurie, O.. Reality TV: Remaking Television Culture edited by Laurie Ouellette and Susan Murray (New York University Press, 2004). Quarterly Review of Film & Video, 2006, 23443-448. DOI: 10.1080/10509200690902241

[2] Beck, D., Hellmueller, L. C., Aeschbacher, N.. Factual Entertainment and Reality TV. Communication Research Trends, 2012, 312: 4–27. Retrieved from:https://search-ebscohost-com.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=ufh&AN=77472340&site=eds-live&scope=site

[3] Chung, S., Cho, H.. Parasocial relationship via reality TV and social media: its implications for celebrity endorsement. Proceedings of the ACM International Conference on Interactive Experiences for TV and Online Video, ACM, 2014: 47-54.

[4] Dholakia, U. M., Bagozzi, R. P., Pearo, L. K.. A social influence model of consumer participation in network-and small-group-based virtual communities. International Journal of Researching Marketing, 2004, 3, 241. Retrieved from: https://search-ebscohost-com.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=edsbl&AN=RN155798684&site=eds-live&scope=site

[5] Horton, D., & Wohl, R.. Mass communication and para-social interaction: Observations on intimacy at a distance. Psychiatry,1956,19(3): 215-229. Retrieved from: https://search-ebscohost-com.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=mnh&AN=13359569&site=eds-live&scope=site

[6] Rubin, R. B., McHugh, M. P.. Development of para-social interaction relationships. Journal of Broadcasting & Electronic Media, 1987, 3: 279. Retrieved from: https://search-ebscohost-com.ezp.lib.unimelb.edu.

au/login.aspx?direct=true&db=edsgao&AN=eds-gcl.5153163&site=eds-live&scope=site

[7] Cai, J.. *Produce 101* Begins a Wave of Interest in Chinese Idol Groups. Pandaily Opinion, 2018. Retrieved from:
https://pandaily.com/produce-101-begins-a-wave-of-interest-in-chinese-idol-groups/

[8] Canaves, S.. CBI News Wrap: Alibaba's Idle Fish, Tencent's Rocket Girls,Placing Products in the Past. ChinaFilmInsider, 2019. Retrieved from:
http://chinafilminsider.com/cbi-news-wrap-august-19-2019/

[9] Chitrakorn, K.. Chinese Reality Shows Boost Brands. Business of Fashion,BoF Professional, 2017. Retrieved from:
https://www.businessoffashion.com/articles/global-currents/chinese-reality-shows-boost-brands

[10] Larsen, K.. ed. Fan culture: Theory/practice. Cambridge Scholars Publishing, 2012: 14-37 .

[11] Kington, C. S.. Con Culture: A Survey of Fans and Fandom. Journal of Fandom Studies 3, no. 2 (June 2015): 211. Retrieved from:
https://search-ebscohost-com.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=edb&AN=103531152&site=eds-live&scope=site

[12] Ford, S.. Fan Studies: Grappling with an "Undisciplined" Discipline. Journal of Fandom Studies 2, no.1 (April 2014): 53. Retrieved from:
https://search-ebscohostcom.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=edb&AN=95342035&site=eds-live&scope=site

[13] Jenkins H. Convergence culture: where old and new media collide. New York: New York UP, 2008.

[14] Jenkins, H.. Textual poachers: Television fans and participatory culture. Routledge, 2012.

[15] Fishbein, M., Ajzen, I.. Understanding attitudes and predicting social behaviour, 1980.

[16] Ballantine, P. W., B. A. S. Martin.. Forming Parasocial Relationships in Online Communities." Advances in Consumer Research, 2005:197. Retrieved from:
https://search-ebscohostcom.ezp.lib.unimelb.edu.au/login.aspx?direct=true&db=edsbl&AN=CN058950920&site=eds-live&scope=site

[17] Booth, P.. Digital fandom2.0: New media studies. New York: Peter Lang, 2012.

[18] Yoon, TJ., ed. The Korean Wave: Evolution, Fandom, and Transnationality. Lexington Books, 2017: 135-136.

[19] Fan, S.. Authorities Vow to Protect Chinese Teens from Talent Shows and the Fan Economy, 2018. Retrieved from:

https://radiichina.com/the-government-wants-to-protect-chinese-teens-from-talent-shows-and-the-fan-economy/

[20] Yin, Y., Xie, Z.. The Bounded Embodiment of Fandom in China: Recovering Shifting Media Experiences and Fan Participation Through an Oral History of Animation-Comics-Games Lovers. International Journal of Communication, 2018, 12: 18.

[21] Yang, L.. Reality talent shows in China. A Companion to Reality Television, Malden, MA: John Wiley & Sons, 2014: 516-40.

[22] Fung, A.. Book review: Chinese Fans of Japanese and Korean Pop Culture: Nationalistic Narratives and International Fandom, 2018.

[23] Go-Globe. Social Media In China – Statistics and Trends, 2013. Retrieved from
https://www.go-globe.com/social-media-china/

[24] Ding, Y., Qiu, L.. The impact of celebrity-following activities on endorsement effectiveness on microblogging platforms: A parasocial interaction perspective. Nankai Business Review International, 2017, 8(2): 158-173.

[25] Xinhua, *Weibo* reports robust Q2 user growth, Business & Company, 2019. Retrieved from:
http://www.chinadaily.com.cn/a/201908/20/WS5d-5ba19aa310cf3e35566d15.html

[26] Wan, V.. The Ultimate Guide to Sina *Weibo*: The Largest Micro-Blogging Platform in China, 2019. Retrieved from:
https://www.dragonsocial.net/blog/chinese-social-media-*Weibo*-and-twitter-comparison/

[27] Gao, Q., Fabian, A., Geert-Jan H, Yong, Y.. A Comparative Study of Users' Microblogging Behaviour on Sina *Weibo* and Twitter. In: Masthoff, J.; Mobasher, B.; Desmarais, M.; Nkambou, R. (Eds.), User Modeling, Adaptation, and Personalization: 20th International Conference, UMAP 2012, Montreal, Canada, Proceedings, Heidelberg: Springer Berlin Heidelberg, 2012: 88-101.

[28] Gong, W., Li, X.. Microblogging reactions to celebrity endorsement: effects   of parasocial relationship and source factors. Chinese Journal of Communication, 2018: 1-19.

[29] Kim, H., Ko, E., Kim, J.. SNS users' para-social relationships with celebrities: social media effects on purchase intentions. Journal of Global Scholars of Marketing Science, 201525(3): 279-294.

[30] Hou, M.. Fan communication on *Weibo*, Diggitmagazine, 2019. Retrieved from:
https://www.diggitmagazine.com/column/fan-communication-*Weibo*

[31] Blanchard, A. L.. Developing a sense of virtual

community measure. CyberPsychology & Behaviour, 2007, 10(6): 827-830.

[32] Gray, J., Sandvoss, C., and Harrington, C. L. (Eds.).. Fandom: Identities and communities in a mediated world. NYU Press, 2017.

[33] Cole, T., Leets, L.. Attachment styles and intimate television viewing: Insecurely forming relationships in a parasocial way. Journal of Social and Personal Relationships, 1999, 16(4): 495-511.

[34] Alperstein, N. M.. Imaginary social relationships with celebrities appearing in television commercials. Journal of Broadcasting & Electronic Media, 1991, 35(1): 43-58.

[35] Auter, PJ.. Psychometric: TV that talks back: An experimental validation of a parasocial interaction scale. Journal of Broadcasting & Electronic Media,1992, 36(2): 173-181.

[36] Ballantine, P. W., Martin, B. A. Forming parasocial relationships in online communities. ACR North American Advances, 2005.

[37] Hoffner, C.. Parasocial and online social relationships. The handbook of children, media, and development, 2008: 309-333.

[38] Labrecque, L. I.. Fostering consumer–brand relationships in social media environments: The role of parasocial interaction. Journal of Interactive Marketing, 2014, 28(2): 134-1.

[39] Yuksel, M., & Labrecque, L. I.. "Digital buddies": parasocial interactions in social media. Journal of Research in Interactive Marketing, 2016,10(4): 305.

[40] Blanchard, A. L., Markus, M. L.. The experienced sense of a virtual community: Characteristics and processes. Advances in Information Systems, 2004, 35(1): 64-79.

[41] Bury, R.. Technology, fandom and community in the second media age. Convergence, 2017,23(6): 627-642.

[42] Blanchard, A. L., Markus, M. L.. The experienced sense of a virtual community: Characteristics and processes. Advances in Information Systems, 2004, 35(1): 64-79.

[43] Highfield, T., Harrington S., Bruns, A.. Twitter as a technology for audiencing and fandom. Information, Communication & Society, 2013, 16: 315–339.

[44] Koh, J., Kim, Y. G., Kim, Y. G.. Sense of virtual community: A conceptual framework and empirical validation. International journal of electronic commerce, 2003, 8(2): 75-94.

[45] Chen, D., Lou, H., Van Slyke, C.. Toward an understanding of online lending intentions: Evidence from a survey in China. CAIS, 2015, 36: 17.

[46] Nie, N. H., Hillygus, D. S., & Erbring, L.. Internet use, interpersonal relations, and sociability. The Internet in everyday life, 2002: 215-243.

[47] Ridings, C. M., Gefen, D.. Virtual community attraction: Why people hang out online. Journal of Computer-mediated communication, 2004, 10(1): JCMC10110.

[48] Kavanaugh, A., Carroll, J. M., Rosson, M. B., Zin, T. T., Reese, D, D. Community networks: Where offline communities meet online. Journal of Computer-Mediated Communication, 2005, 10(4): JCMC10417.

[49] Bond, B. J.. Following Your "Friend": Social Media and the Strength of Adolescents' Parasocial Relationships with Media Personae. Cyberpsychology, Behaviour and Social Networking, 2016, 19(11): 656-660.

[50] Blanchard, A. L., Markus, M. L.. The experienced sense of a virtual community: Characteristics and processes. Advances in Information Systems, 2004, 35(1): 64-79.

[51] Boon, S. D., Lomore, C. D.. Admirer-celebrity relationships among young adults: Explaining perceptions of celebrity influence on identity. Human communication research, 2001, 27(3): 432-465.

[52] Schlosser, A. E., White, T. B., Lloyd, S. M.. Converting web site visitors into buyers: how web site investment increases consumer trusting beliefs and online purchase intentions. Journal of Marketing, 2006,70(2): 133-148.

[53] Schiffinan, L. G., Kanuk, L. L.. Consumer behaviour (7th ed. ed.), 2000. Upper Saddler River, NJ: Prentice Hall; London : Prentice-Hall International.

[54] Yang, K., Jolly, L. D.. The effects of consumer perceived value and subjective norm on mobile data service adoption between American and Korean consumers. Journal of Retailing and Consumer services, 2009,16(6): 502-508.

[55] Vivek, S. D., Beatty, S. E., Morgan, R. M.. Customer engagement: Exploring customer relationships beyond purchase. Journal of marketing theory and practice, 2012, 20(2): 122-146.

[56] Knoll, J., Matthes, J.. The effectiveness of celebrity endorsements: a meta-analysis. Journal of the Academy of Marketing Science, 2017, 45(1): 55-75.

[57] Bock, G. W., Zumd, R. W., Kim, Y. G., Lee, J. N.. Behavioural intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. MIS Quarterly, 2005, 29(1): 87–111.

[58] Chung, D.. Something for nothing: understanding purchasing behaviours in social virtual environments. Cyberpsychology & behaviour, 2005, 8(6):

538-554.

[59] Nambisan, S.. Designing virtual customer environments for new product development: Toward a theory. Academy of Management review, 2002, 27(3): 392-413.

[60] Y. Guo, Barnes, S.. Why people buy virtual items in virtual worlds with real money. ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 2007, 38(4): 69-76.

[61] Beer D., Roger B.. Consumption, prosumption and participatory web cultures: An introduction, 2010: 3-12.

[62] Shin, D. H.. Understanding purchasing behaviours in a virtual economy: Consumer behaviour involving virtual currency in Web 2.0 communities. Interacting with computers, 2008, 20(4-5): 433-446.

[63] Y. Lu, L. Zhao, B. Wang. From virtual community members to C2C e-commerce buyers: Trust in virtual communities and its effect on consumers' purchase intention. Electronic Commerce Research and Applications, 2010, 9(4): 346-360.

[64] X. Jia, Hung, K., K. Zhang. Diversity of Fans on Social Media: The Case of Entertainment Celebrity in China. In Exploring the Rise of Fandom in Contemporary Consumer Culture, 2018:163-184). IGI Global.

[65] WJX, 2019. Retrieved from https://www.wjx.cn/.

[66] Liu, L. L., Li, T. M., Teo, A. R., Kato, T. A., Wong, P. W.. Harnessing social media to explore youth social withdrawal in three major cities in China: Cross-sectional web survey. JMIR mental health,2018 5(2), e34.

[67] Wrench, J. S., Thomas-Maddox, C., Richmond, V. P., McCroskey, J. C.. Quantitative research methods for communication: A hands-on approach, 2008. Oxford University Press, Inc.

[68] Ellison, N. B., Steinfield, C., Lampe, C.. The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. Journal of computer-mediated communication, 2007 12(4): 1143-1168.

[69] Rubin, A. M., Perse, E. M., & Powell, R. A.. Loneliness, parasocial interaction, and local television news viewing. Human Communication Research, 1985 12(2): 155-180.

[70] Burnett, G., Buerkle, H.. Information exchange in virtual communities: A comparative study. Journal of Computer-Mediated Communication, 2004, 9(2): JCMC922.

[71] Koh, J., Kim, Y. G., & Kim, Y. G.. Sense of virtual community: A conceptual framework and empirical validation. International journal of electronic commerce, 2003, 8(2): 75-94.

[72] Koo, D. M., Ju, S. H.. The interactional effects of atmospherics and perceptual curiosity on emotions and online shopping intention. Computers in Human Behaviour, 2010, 26(3): 377-388.

[73] Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., King, J.. Reporting structural equation modeling and confirmatory factor analysis results: A review. The Journal of educational research, 2006, 99(6): 323-338.

[74] Blunch, N.. Introduction to structural equation modeling using IBM SPSS statistics and AMOS. Sage, 2012.

[75] Raykov, T., Marcoulides, G. A.. A first course in structural equation modeling. Routledge, 2012.

[76] Hoyle, R. H.. The structural equation modeling for social and personality psychology. SAGE Publications Ltd, 2011.

[77] Barrett, P.. Structural equation modelling: Adjudging model fit. Personality and Individual differences, 2007, 42(5): 815-824.

[78] Carmines, E.G., Zeller, R.A.. Reliability and validity assessment, Beverly Hills, CA: Sage, 1979.

[79] DeVellis, R.F.. Scale development: Theory and applications, Newbury Park, CA: Sage,1991.

[80] Fornell, C., Larcker, D. F.. Structural equation models with unobservable variables and measurement error: Algebra and statistics, 1981.

[81] McIver, J., Carmines, E. G.. Unidimensional scaling. Sage, 1981, 24.

[82] Bollen, K. A., Long, J. S.. Testing structural equation models. Sage,1993, 154.

[83] Bentler, P. M.. Comparative fit indexes in structural models. Psychological bulletin, 1990,107(2): 238.

[84] Arbuckle, J.L.. Amos16.0 User's Guide. Chicago, IL: SPSS Inc, 2007.

[85] Shim K, Oh SK. Who creates the bandwagon? The dynamics of fear of isolation, opinion congruency and anonymity-preference on social media in the 2017 South Korean presidential election. Computers in Human Behavior, 2018, 1(86): 181-9.

[86] Kirvesmies, T.. Parasocial relationships between Gen Z and social media endorsers (Master's thesis), 2018.

[87] Biau, D. J., Kernéis, S., Porcher, R.. Statistics in brief: the importance of sample size in the planning and interpretation of medical research. Clinical orthopaedics and related research, 2008, 466(9): 2282-2288.

[88] Moon, M. A., Khalid, M. J., Awan, H. M., Attiq, S., Rasool, H., Kiran, M.. Consumer's perceptions of website's utilitarian and hedonic attributes and on-

line purchase intentions: A cognitive–affective attitude approach. Spanish Journal of Marketing-ESIC, 2017, 21(2): 73-88.

[89] Pate, S. S., Adams, M.. "The influence of social networking sites on buying behaviours of millennials". Atlantic Marketing Journal, 2013, 2(1): 7.

[90] Wyatt, S. M., Oudshoorn, N., Pinch, T.. Non-users also matter: The construction of users and non-users of the Internet. Now users matter. The co-construction of users and technology, 2003: 67-79.

[91] Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., Podsakoff, N. P.. Common method biases in behavioral research: a critical review of the literature and recommended remedies. Journal of applied psychology, 2003, 88(5): 879.

[92] Malhotra, N. K., Kim, S. S., Patil, A.. Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. Management science, 2006, 52(12): 1865-1883.

[93] Liang, Y., Shen, W.. Fan economy in the Chinese media and. entertainment industry: How feedback from super fans can propel creative industries' revenue. Global Media and China, 2016, 1(4): 331-349.

[94] Stanfill, M., & Condis, M.. Fandom and/as Labor. Transformative Works and Cultures, 2014, 15.

ARTICLE

Bilingualism and Culture: Psycholinguistic Aspect

Veronika Viktorovna Katermina[1*]   **Olga Logutenkova[2]**

1. Kuban State University, Russia
2. Candidate of Philology, Cyprus, Paphos

ABSTRACT

The development of bilingualism of a bilingual child is inextricably linked with the formation of an individual folklore-linguistic picture of the world. In this regard, proverbs, sayings, riddles and folk phraseology as universal phenomena of folklore of the Russian and Greek languages, which have important linguistic and cultural potential, are of particular interest from the point of view of their presence in the bilingual speech and thought activity. The quantitative and qualitative characteristics of the functioning of paremiological and phraseological units in a bilingual speech determine the content of folklore language worldview and directly depend on the type of formation of the child's early bilingualism. Phraseological and paremiological composition of the folklore picture of the world of natural Russian-Greek bilinguals is asymmetric and directly depends on the type of early bilingualism – in bilinguals who learn two languages on the principle of "one-person-one-language", asymmetry prevails in favor of the Greek language, children from Russian-speaking families whose bilingualism develops according to the principle "family language is the language of society " exhibit better knowledge of Russian folklore elements compared to Greek.

1. Introduction

The early practice of the simultaneous use of several languages in communication has a significant impact on the formation of the brain. The brain of an early bilingual grows and develops under the influence of the need to distinguish between speech signals of different languages, organize speech material, switch from one code to another one [1,3,4].

Early mastery of languages starts the formation of neural ensembles necessary for the quick solution of the problem of choosing an option directly in the process of implementing a program of activities, both verbal and non-verbal [8]. A monolingual brain cannot activate a similar neural ensemble in solving such problems. In general,

compared with the brain of a monolingual, the bilingual brain is more plastic and dynamic, it is able to instantly switch from one type of activity to another, work in a multifunctional mode [9,10].

The relevance of the topic is due to the growing importance of bilingual communication in conditions of close linguistic contact between ethnic groups in the modern world, as well as the wide and active nature of Russian-Greek bilingualism, caused by the growth dynamics of Russian-speaking immigration in Cyprus, which determines its mass character. At the same time, along with the processes associated with the globalization of society, the tendency to preserve the cultural, and, first of all, linguistic roots of modern communities living in bilingualism

Corresponding Author:
Veronika Viktorovna Katermina,
Kuban State University, Russia;
Email: veronika.katermina@yandex.ru

becomes apparent, which causes interest in the problems of the functioning of the elements of the folklore space within the worldview of the Russian-Greek bilinguals. In this regard, problems of an ethnocultural nature are of increasing interest to researchers and the study of the folklore-linguistic picture of the world is of particular importance, since it is in this fragment of the linguistic picture of the world of any people that its culture and history are concentrated, and, therefore, folklore units carry a special pragmatic-culturalological load [2].

2. Methodology

The quantitative and qualitative characteristics of the functioning of paremiological and phraseological units in a bilingual speech determine the content of folklore language worldview and directly depend on the type of formation of the child's early bilingualism, developing depending on the strategy of cultural and linguistic behavior chosen by the parents ("one-person-one-language" or "the language of the family is the language of society" models), which is the leading factor determining the structure of folklore language worldview of bilinguals. Associated factors include the dominant language of society, the general cognitive abilities of the individual, his psychological characteristics, etc [5,6].

The psycholinguistic experiment was carried out in several stages at each stage of the study and included the method of directed associative experiment, the method of completion without a given set of reactions, and the method of subjective definition. At the stage of analyzing the experimental data, we simultaneously used a post-experimental conversation with informants [7].

The algorithm includes a series of steps: processing the questionnaires, quantifying the answers received depending on the type of bilingualism and the study language, bringing the data into uniformity, assigning an adequacy score for the interpretation of the parameters, drawing up summary tables and diagrams of the received data. a series of psycholinguistic experiments, including several stages, which were carried out on the basis of the Russian school of Paphos with the participation of Russian-Greek bilinguals from 2015 to 2018. In total, 4 experiments were carried out, each of which was aimed, respectively, at revealing the peculiarities of the proverbs and sayings, folk signs, folklore riddles, and folk idioms in the folklore worldview of bilinguals.

3. Results

Paremias and phraseological units possess the highest communicative value, the structural-semantic equivalence of which does not coincide in the languages being compared – these are language units containing toponymic components, names of saints and other proper names, as well as paremias and phraseological units that reflect historical events, customs. It is precisely such paremiological and phraseological units that were of the greatest interest for our experimental study, since, being distinguished by significant national and cultural features, they play a special role in the formation of folklore worldview of bilinguals.

Experiment No. 1 devoted to identifying the features of the proverbial fragment of the folklore worldview of bilinguals included three stages. At the first stage, the informants were asked to write down any proverbs and sayings of the thematic groups "Time" and "Money" in Russian and Greek.

The second stage of the experiment included questioning with the omission of lexical units; in the third stage, we used the subjective definition technique, which is widely used in psycholinguistic studies of recent years. The bilinguals were offered Russian and then Greek paremias of the thematic groups "Money" and "Time" (15 units of each group in each language), who needed to give a brief descriptive explanation in an abstract (abstract from the literal meaning) form. The results of a quantitative and qualitative analysis of respondents' answers at all three stages of experiment No. 1 allowed us to come to the following conclusions:

(1) The composition and structure of the proverbial fragment of the folklore picture of the world, presented by the thematic groups "Time" and "Money", varies depending on the type of early bilingualism. Bilinguals 1 demonstrate a higher level of proficiency in Greek phraseological units with a significantly lower level of proficiency in Russian phraseological units compared to bilinguals 2.

(2) Most of the reactions of the second stage of the experiment were speech variants that were as close as possible to the linguistic form of phraseological units, for example: *Each vegetable* (variation – *fruit*) *has its own time; You cannot buy the mind for money* (variations – *you will not receive, you will not get, you will not change*). Nevertheless, reactions that went beyond the limits of normative variation were recorded in 12%, deforming not only the form of phraseological units, but also their semantic content, for example, *The spoon for lunch and red egg for dinner are precious; Chickens with hens count; If you miss a minute, everything will be lost*.

(3) The answers of the third task of the experiment, assuming a free interpretation of paremias, are more varied among representatives of the 1st type of bilingualism which may indicate both a more developed creative think-

ing of the bilinguals of this group and the lack of fear of error, which is inherent in mono-ethnic bilinguals regarding the Greek language.

(4) The recorded cases of code switching within the same sentence are more characteristic of bilinguals 1 (85%) and, in our opinion, are a sign of balanced bilingualism. For example: *Who wants money, he does not sleep day and night. – He has a psychology (this is in Greek)*. The mark in brackets is made by the student, the specified Greek word indicates the presence of psychological problems. *To the late guest – bones. – You will be late – you will remain νηστικός (hungry)*. The translation strategy, which is mainly used by bilinguals from mono-ethnic families when defining the Greek language phraseological units, indicates the interfering and stimulating role of the Russian language in the speech activity of bilinguals 2. For example: *ήο σήμερα είναι νωρίς, τ΄αύριο αργά θα είναι. – Today is early, tomorrow will be late; Ο καιρός είναι γιατρός (Time is a doctor)*, etc.

(5) The level of paremiological competence of bilinguals depends not only on the amount of language material (input) received in educational and everyday discourse, but also on the general level of the child's cognitive and speech development, its ability to correlate the general and particular, the external image and the internal content of proverbs and sayings.

In experiment No. 2, aimed at identifying the features of the fragment of the folklore language picture of the world, represented by folk signs, informants were asked to continue the started signs (a total of 264 units) containing the observation, the forecast they predicted. The experiment was carried out in several stages. At the first stage, bilinguals worked only with signs of the Russian language, at the second stage – in 6 weeks – with signs of the Greek language. In both cases, the task was accompanied by a request to answer the following question: do the bilinguals and their families adhere to the beliefs indicated by putting the corresponding signs "+" (yes) and "-" (no).

Quantitative and qualitative processing of the experimental results allowed us to draw the following conclusions:

(1) Greek folk signs, observed by bilinguals in life, accounted for a larger percentage compared to Russians, which is explained by the respondents' better knowledge of the signs characteristic of the Greek-speaking society as a whole. As the analysis showed, the most relevant are signs about money, among which the most popular in the analyzed case are the following: *If you throw out the trash after six in the evening, there will be no money; If you count the money after sunset, you will be left without money; Αν σε τρώει το δεξί σου χέρι θα δώσεις χρήματα (If*

the right palm itches, you will give money); Αν σε τρώει το αριστερό σου χέρι θα πάρεις χρήματα (If you scratch your left palm, you will get money), etc. In the second place in both languages are signs indicating the unfavorable nature of the forecast, which is formulated in an extremely abstract way: *bad, unfortunately, to failure*. The most popular sign was a black cat. The results of the experiment showed a higher percentage of knowledge of Greek everyday and natural folk signs, due primarily to the fact that Greek is dominant in the language environment of the bilinguals participating in the experiment. Moreover, in general, students showed a low level of knowledge of signs in both languages, and household signs in both cases were better known to them than natural ones.

(2) Among the signs of the Russian language that were unmistakably continued by bilinguals, 70% belong to the signs that we selected as a group of absolute equivalents (AE) for Russian and Greek, while absolute equivalents of the Greek language were continued correctly in 45%. The greatest difficulty in completing the task was caused by weather and calendar signs, for example: *If it's sunny in winter, winter will be late. / Αν της Υπαπαντής έχει ήλιο, ακολουθεί χειμώνας όψιμος; If the month is in a dull haze, there will be bad weather. / Όταν το φεγγάρι σκεπάζεται από ομίχλη, θα έχουμε κακοκαιρία; If the sun is in a dim white haze, it will rain. / Όταν ο ήλιος είναι άσπρος και θαμπός, θα έρθει βροχή; If the stars flicker strongly, there will be inclement weather. / Άμα παίζουν τ'αστρα, θα έχουμε κακοκαιρία*. At the same time, weather and household signs related to certain animal behavior were quite well known to bilinguals: *Καλός οιωνός θεωρείται και ότι θα έχουμε ευτυχία αν δούμε το ουράνιο τόξο. / If you see a rainbow in the sky – you will find joy; Όταν πετούν χαμηλά τα χελιδόνια, τότε θα βρέξει. / If the swallows fly low, it will rain; Αν νίβεται η γάτα σου θα σου έρθουν ξένοι. / If the cat is washing, there will be guests, etc*. Despite the fact that these signs were continued correctly, as the survey showed, they are not relevant in the life of bilinguals, unlike household ones, which, according to the answers, are kept by members of the informant family (for example, *Όταν μπαίνει κάποιος για πρώτη φορά στο σπίτι σου, να μπει με το δεξί, για να σου πάνε όλα καλά! / When you enter the house for the first time, you need to do it with your right leg, then everything will be OK*).

(3) Signs representing semantic equivalents accounted for 22% of the total number of correct answers in Russian and 30% of the total number of correct answers in Greek, with the vast majority of correct predictions being given in cases of household signs. The second part of many natural signs was repeated for the most varied cases of observation, proving our assumption that, without sufficient

ethnocultural knowledge in the field of folk natural-calendar signs, bilinguals will substitute any propositions known to them: *it will rain, it will be hot, it will be cold, θα έχει καλό καιρό (the weather will be fine), θα βρέξει (it will rain)*.

(4) Partial equivalent signs accounted for 9% of all correctly continued paremiological units given to bilinguals in Russian, and 15% in Greek. For example, a Russian sign *If the right eyelid is twitching, you will receive good news*, many continued incorrectly, suggesting the Greek version of the sign: *Αν έλλεται το δεξί σου μάτι θα δεις αγαπημένο πρόσωπο (If the right eyelid is twitching, you will meet your love)*. Another sign: *If you put a thing inside out – you will be beaten (or you will experience other troubles)* in 50 cases was continued like "no one will give you an evil eye" that is the way Greeks and Cypriots say – *Αν φορέσουμε τα ρούχα μας από την ανάποδη πλευρά σημαίνει ότι δεν πρόκειται να μας πιάσουν κατάρες*.

(5) Among the signs that have no equivalents in the languages under consideration there were only 10 correct answers in Russian and 18 answers in Greek. The largest number of correct answers (89%) in this group was received by the first part of the signs *Το χύσιμο του καφέ θεωρείται καλός οιωνός (Spilling your coffee is good luck)*.

Experiment 3 was aimed at determining the degree of understanding by children aged 11-12 of the metaphorical traditional and modern riddles of the Russian and Greek languages with different principles of metaphorization and conceptualization. The following phenomena and objects of the natural world acted as enigmatists: *rain, snow, wind, thunder, sun, month, stars, day and night, cloud, sea, stream*. The choice of such topics for the experiment is not accidental – reflecting the universal human realities of the world around us, each of the hidden phenomena reveals in the enigmatic texts of different peoples ethnospecific features of the worldview, different ways of dividing the world.

Since each riddle is based on a metaphor an analysis of bilingual guesses allows us to draw certain conclusions about the relationship between the images of Russian and Greek language pictures in the linguistic consciousness of bilinguals. Considering the reactions of bilinguals as a reflection of the degree of systematic images of the world that actually exist in their minds, we can conclude that the folklore picture of the bilingual world 1 combines more traditional images of two cultures, while bilinguals 2 demonstrate signs of the dominance of Russian culture. So, among the frequent responses of bilinguals of the last group to the riddle about the sun A golden cheesecake rolls, no one will get it – neither the king, nor the queen,

nor the red girl we meet such as a magic ball, a barrel with his mother and son from the fairy tale by A.S. Pushkin. Also, among few answers to the Greek riddle about the month *Επάνω από σπίτι μας χαλί στρωμένο με καρύδια και στη μέση μια κούπα μέλι (There is a carpet covered with nuts, and in the middle there is a cup with honey) a piece of wood in the middle of our culture)* were such cases which have a direct reference to the images of Russian traditional culture: *an island in the sea, a tablecloth with refreshments, a carpet-plane*. Despite the fact that the percentage of correctly guessed traditional Russian riddles turned out to be very low, the ability of schoolchildren to independently create metaphorical images, somehow prompted by the text of this genre, deserves special attention. The most illustrative example of the figurative thinking of the children participating in the experiment is, in our opinion, the poetic image of human souls, recorded in 4 answers, which was caused by the riddle about the stars: *Peas are scattered along 70 roads. Nobody collects: neither the king nor the queen, only God alone (about the stars)*.

The number of correct answers to traditional Greek riddles averaged 65%, which significantly exceeds the percentage of correctly guessed Russian folk riddles. This fact can be explained by the fact that Greek folk riddles did not undergo such noticeable transformations as the corresponding Russian texts, and are used in preschool and school education in their original unchanged form, which predetermined the knowledge of answers by schoolchildren to many riddles included in the experiment. So, actualized in Greek riddles about rain, stream, cloud, etc. traditional metaphors are firmly entrenched in the linguistic consciousness of bilingualism, since the language for the most part lacks equivalents that could be generated by modern images.

Experiment No. 4, the purpose of which was to identify the peculiarities of the phraseological fragment of folklore language picture of the world of bilinguals, was carried out on the basis of folk phraseology using subjective definition methodology out of context (stage 1) and in context (stage 2) and classification of the considered phraseological units according to their level of representations in the passive language dictionary of bilinguals. In accordance with the instructions at the first stage of the experiment, the informants were required to give their own explanation of the proposed phraseological units (totaling 80 units) and choose one of the following options: 1) this phraseological unit was encountered by you for the first time; 2) you heard it, but do not know its meaning; 3) this phraseological unit is familiar to you.

A quantitative analysis of the results showed that the

sum of the points measuring the degree of students' acquaintance with the phraseological units of the Greek language significantly exceeds the number of points in relation to Russian phraseological units, while the opposite situation is observed in the group of mono-ethnic bilinguals. At the second stage of experiment No. 4, bilinguals were offered to explain the meaning of 40 phraseological units of the Russian and Greek languages in the context ю.

In the course of a qualitative analysis of the obtained experimental material, we established a number of semantic and structural features of the presented subjective definitions depending on the type of early bilingualism, which can be summarized as follows:

(1) Features of the semantic content of phraseological units reflected in the linguistic representation of the definitions of the subjects indicate different levels of understanding of these linguistic units by mono-ethnic and bi-ethnic bilinguals: the meaning of Russian phraseological units was explained in most cases correctly by bilinguals 2, and the meaning of Greek by bilinguals 1, regardless of the context

(2) For bilinguals 2, phraseology definitions are more characteristic (defining one phraseologism by means of another, synonymous with the first) when explaining the phraseological units of the Russian language, the reason for which we see in a higher level of proficiency in units of the Russian phraseological fund with mono-ethnic bilinguals: to brew porridge – to break wood; to fool around – to beat the buck, etc.

(3) Bilinguals 2 actively use slang which is explained by a higher level of communication skills of bilinguals of this type in Russian language and the presence of appropriate speech experience

(4) Bilinguals of both groups often resort to a translation strategy when defining phraseological units, which, obviously, is aimed at saving speech efforts and language means

(5) The reactions of bilinguals 1 are distinguished by more detailed definitions, numerous refinements, and personal examples.

(6) Representatives of bio-ethnic and mono-ethnic bilingualism demonstrate a different level of proficiency in phraseological and paremiological units of the Greek and Russian languages, therefore the content and means of explication of the folklore language picture of the world of the bi-ethnic and mono-ethnic bilingual possess unique characteristics along with the general ones. The main difference is the asymmetry of the verbalized cultural-national images and stereotypes of Russian and Greek linguistic cultures represented in the linguistic consciousness of bilinguals. Thus, bilinguals, whose bilingualism was formed according to the "one parent – one language" model, are more influenced by Greek and Cypriot cultures in comparison with bilinguals who receive language experience in the family exclusively in Russian (non-dominant), which facilitates the formation of the paremiological and phraseological competence of representatives of the first group in Greek and determines the stimulating and interfering role of Greek linguistic culture in the structure of folklore language picture of the world. Representatives of bilingualism, formed according to the model "family language – the language of society", are characterized by the opposite situation with the dominance of characteristics of Russian linguistic culture in the folklore language picture of the world

4. Conclusion

Knowledge of two languages does not always mean the same knowledge of the cultural and, in particular, folklore code of these languages. So, in our case, natural Russian-Greek bilinguals born in interethnic families found a significantly lower percentage of knowledge of Russian folklore concepts compared to Greek ones, i.e. the "one parent – one language" tactics chosen by the family is not necessarily a guarantee of a symmetrically formed folklore picture of the world, in which the functional balance of the folklore language units of both bilingual languages would be respected. The limited speech experience of a bilingual child in a language that is not dominant in a particular language group deprives him of the ability to fully absorb the linguistic material necessary for active speech generation in all its diversity. At the same time, empirical material showed that in the folklore picture of the world of children from monolingual Russian-speaking families, stereotypical images typical of the Russian language picture predominate, which again indicates an imbalance in the components of the bilingual folklore picture of the world. This conclusion indicates that the basis of the folklore language picture of the bilingual world, which presupposes the knowledge of two languages and necessarily contains ethnospecific components of both linguistic cultures, is formed primarily in the family as a result of the strategy of cultural and linguistic behaviour chosen by the parents. Parental linguistic input in each of the acquired bilingual languages determines the appropriate level of proficiency in this language by the child, forming the language picture of the world; the involvement of culturally-specific components of each of the linguistic cultures to a relatively equal extent, among which the decisive role belongs to the folklore genres, contributes to the establishment of a balanced folklore language picture of the world, which is further influenced by additional factors.
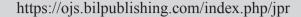
References

[1] Bialystok E.. Bilingualism in Development: Language, Literacy, and Cognition[M]. Cambridge: Cambridge University Press, 2001.

[2] Bloomfield L.. Language[M]. Chicago: University of Chicago Press, 1933.

[3] Cantone K.F., Kupisch T., Müller N., Schmitz K.. Rethinking language dominance in bilingual children[J]. Linguistische Berichte, 2008, 215: PP. 307-343.

[4] Gathercole V.C. Kennedy I., & Thomas E. M.. Socioeconomic level and bilinguals' performance on language and cognitive measures[J]. Bilingualism: Language and Cognition. 2016, 1: 1-22.

[5] Grosjean F.. Another view of bilingualism[J]. Cognitive Processing in Bilinguals. 1992, 83: 51–62.

[6] Hornby P.. Bilingualism. Psychological, Social, and Educational Implications[M]. New York: Academic Press, 1977.

[7] Kim A., Park A. & Lust B.. Simultaneous vs. successive bilingualism among preschool-aged children: a study of four-year-old Korean–English bilinguals in the USA[J]. International Journal of Bilingual Education and Bilingualism, 2016. URL: http://www.tandfonline.com/doi/abs/10.1080/

[8] Pinker S.. The Language Instinct[M]. New York, NY: Harper Perennial Modern Classics, 1994.

[9] Romaine S.. Bilingualism[M]. UK: Blackwell, 1995.

[10] Skutnabb-Kangas T.. Bilingualism or not: the education of minorities[M]. Clevedon: Multilingual Matters,1981.

ARTICLE

The Relationship between Flow Experience in Leisure and Life Satisfaction in Undergraduates

Yongmei Hou[*]   Yuan Jiang

Department of Psychology, School of Humanities and Management, Guangdong Medical University, Dongguan, Guangdong, 523808, China

ABSTRACT

Objective: To understand the current situation of undergraduates' flow experience in leisure and life satisfaction, and to explore the relationship between the two. **Methods:** A stratified random sampling method was used to select 781 undergraduates (377 males and 410 females) from 7 colleges and universities in Guangdong Province. They were investigated using the Flow Experience in Leisure Questionnaire (FELQ) and the Youth Life Satisfaction Scale (YLSS). **Results:** The total scores of FELQ and YLSS of the students in this group are (161.73 ± 19.81) and (174.45 ± 26.50). FELQ's unity of knowledge and action, challenge and skill balance, concentration, grade ranking, family economic status are positively related to YLSS' life satisfaction ($\beta = .227, .115, .098, .158, .082, P < .05$); "Like to sleep during leisure" is negatively correlated with life satisfaction of YLSS ($\beta =-. 097, P <.05$); FELQ's unity of knowledge and action, concentration, grade ranking and family economic status are positively related to YLSS's self-satisfaction ($\beta = .286, .126, .194, .096, P <.01$); "Like to sleep during leisure" is negatively correlated with YLSS's self-satisfaction ($\beta =-. 091, P <.01$); FELQ's unity of knowledge and action, challenge and skill balance, father's occupation, "like self-study in leisure" are positively related to YLSS' environmental satisfaction ($\beta = .198, .131, .075, .073, P <.05$); "Like to sleep during leisure", gender and YLSS environment satisfaction negatively correlated ($\beta =-. 094, -.091, P <.01$). **Conclusion:** Flow experience in leisure, types of leisure activities, gender, grade ranking and family factors (family economic status and father's occupation) may be related factors for the development of college students' life satisfaction.

1. Introduction

There is no unified definition of leisure. Broadly speaking, "leisure" refers to activities, behaviors and mental states during "leisure". The narrow sense of leisure refers to activities or behaviors performed by people with a positive mindset during "leisure" in the short-term in order to restore and develop physical or mental strength, and long-term in order to improve physical and mental health and personal quality, and these activities or behaviors can allow individuals to obtain a free and comfortable psychological experience [1].

*Corresponding Author:
Yongmei Hou,
Department of Psychology, School of Humanities and Management, Guangdong Medical University, Dongguan, Guangdong, 523808, China;
E-mail: 2184456621@qq.com

Reasonable leisure helps people meet the psychological needs of recreation, relaxation, self-improvement, self-confidence enhancement, etc., improve physical and mental health, and improve life satisfaction [2-4]. Further research found that different types of leisure produce different levels of satisfaction [5,6]. People will get more satisfaction and happiness when doing serious, organized and constructive leisure activities; on the contrary, non-serious leisure, such as watching TV, will produce less satisfaction [6].

The type of leisure activity is an external factor that affects life satisfaction, and the inner experience of leisure is an internal factor that affects life satisfaction.

The flow experience was first proposed by Csikszentmihalyi in the 1960s [5], which is also known as the optimal experience of an individual engaged in activities. It is a special experience that people experience when they are fully engaged in activities, which appears to be completely attracted by the activity itself, consciousness is concentrated in a very narrow range, consciousness and ideas unrelated to the activity are filtered out, and lose self-consciousness and enter the realm of ecstasy. At this time, the subject only responds to specific and clear feedback, obtains a sense of pleasure throughout the body, and generates a sense of control through the manipulation of the environment. There is very little difference between stimulus and self-response, self and environment, past, present and future [5].

It can be imagined that smooth experience is the direct reason for leisure activities to improve life satisfaction. However, there are not many empirical studies on the relationship between flow experience in leisure and life satisfaction, and most of them are adults [7,8]. This study intends to use a large sample questionnaire to quantify the relationship between college students' flow experience in leisure and life satisfaction, with a view to providing data support for clarifying the relationship between the two and providing a reference for the guidance of college students' leisure activities.

2. Objects and Methods

2.1 Objects

The stratified random sampling method was used to select 831 students from 7 undergraduate colleges and universities (undergraduate first and second batch, Category A) in Guangdong Province. Firstly, the undergraduate colleges and universities (undergraduate first and second batch, Category A) in Guangdong Province are divided into 7 categories including science and engineering, liberal arts, agronomy, medicine, sports, arts and comprehensive categories according to the professional category, and 1 randomly selected from the 7 categories of colleges and universities, which are respectively South China University of Technology, Guangdong Universities of Foreign Studies, Zhongkai University of Agriculture and Engineering, Guangdong Medical University, Guangzhou Sport University, Xinghai Conservatory of Music, Shenzhen University. Then determine the sample size to be drawn according to the proportion of enrollment, which are 150, 147, 62, 123, 118, 50 and 181 respectively. A total of 831 questionnaires were distributed and 787 valid questionnaires were recovered, with an effective rate of 94.7%. There are 377 males and 410 females; 155 in science and engineering, 132 in liberal arts, 62 in agriculture, 114 in medicine, 93 in sports, 50 in art and 181 in management.

2.2 Tools

2.2.1 Flow Experience in Leisure Questionnaire (FELQ) [6]

Complied by Zhaoyuan Guo (2003). A total of 45 items are divided into 9 dimensions: balance of challenge and skill, unity of knowledge and action, clear goals, clear feedback, concentration, sense of control, loss of self-consciousness, loss of time, and self-contained goals. A rating of 5 levels from 1 (strongly disagree) to 5 (strongly agree) was used. The higher the score, the stronger the sense of fluency in leisure. A total score of 180 or more is a flow experience in leisure. In this study, the *Cronbach α* coefficient of the total table is 0.901, and the *Cronbach α* coefficients of the nine dimensions are 0.814 to 0.866, respectively.

2.2.2 Youth Life Satisfaction Scale (YLSS) [9]

Complied by Xinggui Zhang et al. (2004). A total of 36 items are divided into two dimensions of self-satisfaction and environmental satisfaction. Self-satisfaction includes 4 sub-dimensions: friendship satisfaction, family satisfaction, academic satisfaction and freedom satisfaction; environmental satisfaction includes two sub-dimensions: school satisfaction and environmental satisfaction. A scale of 7 is used from 1 (completely non-compliant) to 7 (fully compatible). The higher the score, the higher the life satisfaction. In this study, the *Cronbach α* coefficient of the total table is 0.873, and the *Cronbach α* coefficients of the two dimensions are 0.833 and 0.851, respectively.

2.2.3 Self-Made General Personal Information Questionnaire

The questionnaire contains 32 items, such as: gender,

grade, school type, professional category, grade ranking, source of birth, whether there is only one child, major leisure activities, family economic status, father's occupation, mother's occupation, father's education level, mother's education level, value of leisure activities, leisure time per day on working days, leisure time per day on weekends, etc.

2.3 Statistical Methods

Use SPSS 20.0 to count the data. Use descriptive statistics to calculate the average score and standard deviation of each scale, and use Pearson correlation to analyze the flow experience in leisure questionnaire (FELQ) and youth life satisfaction scale (YLSS) scores, and multiple linear regression was used to analyze the related factors of YLSS total score and two-dimensional score.

3. Results

3.1 The Current Status of Undergraduate FELQ and YLSS

As can be seen from Table 1, the total score of YLSS is 174.45 ± 26.50 (the average score of each question is 4.85 ± 0.74); the total score of FELQ is 161.73 ± 19.81 (each question is divided into 3.59 ± 0.44), all undergraduates participate in leisure activities, and the total score of FELQ is 180 or more, 124 people, accounting for 15.88% (124/781) of the sample size. In other words, 84.12% of undergraduates lack flow experience in leisure, and life satisfaction is slightly satisfactory.

Table 1. Descriptive statistics of FELQ and YLSS scores

Dimension	Mean ± standard deviation	Maximum	Minimum
Challenge-skill balance	18.83±2.97	25	7
Unity of knowledge and action	18.84±2.99	25	9
Clear objectives	17.86±2.47	25	7
Clear feedback	17.81±2.43	25	9
Concentrate	17.57±2.57	25	8
Sense of control	17.04±2.73	25	7
Loss of self-consciousness	15.88±3.06	25	8
Lost time	18.37±3.20	25	9
Self-targeting	19.56±3.07	25	8
flow experience in leisure	161.73±19.81	225	91
Friendship satisfaction	35.64±6.02	49	9
Family satisfaction	35.90±8.05	49	9
Academic satisfaction	25.25±6.45	42	6
Freedom satisfaction	24.85±4.64	35	8
School satisfaction	28.76±5.88	42	6
Environmental satisfaction	24.05±4.28	35	5
Self-satisfaction	121.64±20.05	218	41
Environmental satisfaction	52.82±9.33	77	11
Life satisfaction	174.45±26.50	280	52

3.2 Correlation Analysis of Undergraduate FELQ and YLSS

It can be seen from Table 2 that the total score of FELQ, the score of each dimension and the total score of YLSS, two dimensions and the scores of 6 sub-dimensions are significantly positively correlated (r = .085 ~ .412, P <.05)

Table 2. Correlation analysis of FELQ and YLSS scores

	Friendship	Family	School	Environment	Freedom	Academic	Self-satisfaction	Environmental satisfaction	Life satisfaction
1. Challenge-Skill Balance	.387**	.202**	.280**	.242**	.317**	.344**	.382**	.288**	.391**
2. Unity of knowledge and action	.406**	.254**	.255**	.281**	.344**	.328**	.409**	.290**	.412**
3. Clear targets	.318**	.189**	.200**	.166**	.304**	.288**	.335**	.202**	.325**
4. Clear feedback	.302**	.194**	.213**	.215**	.265**	.311**	.330**	.233**	.333**
5. Attention	.327**	.214**	.209**	.187**	.282**	.330**	.356**	.217**	.348**
6. A sense of control	.239**	.104**	.184**	.126**	.230**	.321**	.270**	.175**	.266**
7. Loss of self-consciousness	.156**	.090*	.090*	.085*	.197*	.315**	.230**	.096*	.208**
8. Lose time	.220**	.153**	.145**	.193**	.215**	.187**	.237**	.181**	.243**
9. Self-targeting	.305**	.186**	.238**	.219**	.272**	.201**	.294**	.251**	.312**
10. FELQ total score	.381**	.227**	.259**	.248**	.346**	.372**	.406**	.278**	.406**

Notes: * P<0.05，** P<0.01

3.3 Regression Analysis

3.3.1 Variable Assignment

Assign possible conditions (alternative answers) to variables (demographic variables and psychosocial factors) that may affect the YLSS score, and the results are shown in Table 3.

3.3.2 Multiple Linear Regression Analysis of Factors Related to Undergraduate Life Satisfaction

Multivariate linear regression was performed using the YLSS total score and self-satisfaction and environmental satisfaction factors as dependent variables, and the 32 demographic factors, psychosocial factors and 9 FELQ factors in Table 3 as independent variables, the results show (Table 4) that FELQ's unity of knowledge and action, challenge and skill balance, concentration, grade ranking, family economic status are positively correlated with the total score of YLSS (β = .227, .115, .098, .158, .082, both $P < .05$); "Like to sleep during leisure" is negatively correlated with the total score of YLSS (β =-. 097, $P < .05$); FELQ's unity of knowledge and behavior, concentration, grade ranking and family economic status are positively correlated with YLSS's self-satisfaction (β = .286, .126,, 194, .096, $P < .01$); "Like to sleep during leisure" is negatively correlated with YLSS's self-satisfaction (β =-. 091, $P < .01$); FELQ's unity of knowledge and action, challenge and skill balance, father's occupation, "leisure likes self-study" is positively correlated with YLSS's environmental satisfaction (β = .198, .131, .075, .073, $P < .05$) "Like sleep laziness during leisure time", gender and YLSS's environmental satisfaction are negatively correlated (β =-. 094, -.091, $P < .01$).

Table 3. Variable Assignment

Items	Options and assignments
1. Gender	0 = Male, 1 = Female
2. Grade	0 = freshman, 1 = freshman, 2 = freshman, 3 = freshman
3. Ranking of grades of grades after	0 = 70%, 1 = 51 ~ 70%, 2 = 31 ~ 50%, 3 = 11 ~ 30%, 4 = top 10%
4. School category	0 = Science and Technology, 1 = Liberal Arts, 2 = Agronomy, 3 = Medicine, 4 = Sports, 5 = Art, 6 = General
5. Professional category	0 = Science, 1 = Engineering, 2 = Liberal Arts, 3 = Agronomy, 4 = Medicine, 5 = Sports, 6 = Art, 7 = Management
6. Whether the only child is	0 = yes, 1 = no
7. Family economic status	0 = poverty, 1 = struggle, 2 = normal, 3 = well-off, 4 = rich
8. Birthplace	0 = city, 1 = town, 2 = rural
9. Father's education level	0 = primary school or below, 1 = junior high school, 2 = high school, 3 = university or above
10. Mother's education level	0 = primary school or below, 1 = junior high school, 2 = high school, 3 = university or above
11. Father's occupation	0 = IT and communication, 1 = finance, securities and insurance, 2 = commerce and trade, 3 = energy, 4 = journalism, 5 = real estate, 6 = tourism, 7 = manufacturing, 8 = Education, 9 = Other
12. Mother's Occupation	0 = IT and Communication, 1 = Finance, Securities and Insurance, 2 = Commerce, 3 = Energy, 4 = Journalism, 5 = Real Estate, 6 = Tourism, 7 = Manufacturing, 8 = Education, 9 = Other
13. The meaning of leisure	0 = very important, 1 = more important, 2 = normal, 3 = less important, 4 = not important
14. Leisure time per day on working days	0 = less than 2h, 1 = 2~4h (including 2h), 2 = 4~6h (including 4h), 3 = 6~8h (including 6h), 4 = above 8h (including 8h)
15. Weekend leisure time per day	0 = less than 2h, 1 = 2~4h (including 2h), 2 = 4~6h (including 4h), 3 = 6~8h (including 6h), 4 = more than 8h (including 8h)
16. Do you like reading during leisure?	0 = dislike, 1 = like
17. Do you like to go online during leisure?	0 = dislike, 1 = like
18. Do you like to listen to the radio during leisure?	0 = dislike, 1 = like
19. Do you like to hang out at leisure?	0 = dislike, 1 = like
20. Do you like self-study at leisure?	0 = dislike, 1 = like
21. Do you like chatting with friends in your leisure time?	0 = dislike, 1 = like
22. Do you like to watch movies at leisure?	0 = dislike, 1 = like
23. Do you like to listen to music at leisure?	0 = dislike, 1 = like
24. Do you like computer games at leisure?	0 = dislike, 1 = like
25. Do you like sports in your leisure time?	0 = dislike, 1 = like
26. Do you like playing chess and cards in your leisure time?	0 = dislike, 1 = like
27. Do you like to work part-time during leisure?	0 = dislike, 1 = like
28. Do you like traveling during leisure?	0 = dislike, 1 = like
29. Do you like club activities during leisure?	0 = dislike, 1 = like
30. Do you like talent activities during leisure?	0 = dislike, 1 = like
31. Do you like to sleep lazy during leisure?	0 = dislike, 1 = like
32. Do you like other leisure activities?	0 = dislike, 1 = like

4. Discussion

This study found that life satisfaction of undergraduates is at a slight satisfaction level; all undergraduates participate in leisure activities, and 84.12% of undergraduates have never experienced flow experience in leisure, which is consistent with previous research results [10,11]. It indicates that the quality of undergraduate leisure activities is not high, and life satisfaction needs to be improved.

Multiple linear regression analysis shows that FELQ's unity of knowledge and action, challenge and skill balance, and concentration are positively related to YLSS's life satisfaction, and leisurely sleeping is negatively related to YLSS's life satisfaction, consistent with the results of previous studies [5,6,11]. It is suggested that multiple elements of flow experience in leisure are positive correlation factors of life satisfaction. Specifically, when an individual has mastered certain knowledge and skills, and combined the two organically, they are used in leisure activities, especially devoted to leisure activities, and when they are fully absorbed, they will find that they can overcome certain (or even Growing difficulty), thereby increasing self-confidence, triggering positive emotions and cognition, experiencing the beauty of life, and thus improving life satisfaction. It can be seen that leisure is not just killing time, it is not a waste of time, but is of psychological construction [1].

Grade rankings, family economic status and YLSS life satisfaction are positively correlated, consistent with previous research results [5,6,11]. Grade ranking is an important indicator reflecting undergraduates' learning ability and academic achievements. The more the ranking depends on the former, the higher their learning ability, the greater their academic achievements, and the parties therefore experience stronger self-confidence and self-esteem [12], Produce positive awareness, improve self-satisfaction and overall life satisfaction. The economic status of the family is the material condition for family members to live. On the one hand, good family economic conditions help to create a better living environment and improve individual environmental satisfaction, on the other hand, good family economic conditions help individuals' self-esteem and self-confidence [13], thereby improving overall Life satisfaction.

Like to sleep during leisure will reduce life satisfaction, consistent with Xiong Ying's research results [11]. It is suggested that excessive negative rest is not leisure, and it cannot bring individuals an experience of relaxation, pleasure and happiness. Because sleepers waste more time, they tend to produce a sense of inability to do nothing and do nothing, and therefore generate more negative emotions and negative cognition, reduce self-evaluation and environmental assessment, and reduce life satisfaction overall.

This study found that sleep-likeness was negatively correlated with the total score of YLSS and the scores of the two factors, self-study during leisure was positively correlated with environmental satisfaction, and other leisure activities (including watching TV) were not significantly associated with YLSS score , which is inconsistent

Table 4. Multiple linear regression analysis of influencing factors of FELQ scores

Dependent variable	Independent variable	Regression Coefficients		Standardized regression Coefficient (*β*)	*t*-value	*P*-value	R^2	R_{adj}^2
		B	SE					
Life satisfaction	Unity of knowledge and action	1.994	.481	.227	4.144	<.001	.436	.430
Grade ranking		3.586	.731	.158	4.903	<.001		
Sleep at leisure		-5.483	1.793	-.097	-3.058	.002		
Family's financial situation		2.940	1.151	.082	2.555	.011		
Challenge-skill balance		1.021	.446	.115	2.288	.022		
Concentrate		1.006	.446	.098	2.257	.024		
Life satisfaction Unity of knowledge and action		1.911	.284	.286	6.724	<.001	.461	.467
Grade ranking		3.354	.549	.194	6.106	<.001		
Family's financial situation		2.600	.868	.096	2.994	.003		
Concentrate		.983	.332	.126	2.958	.003		
Like to sleep at leisure		-3.869	1.342	-.091	-2.884	.004		
Environment satisfaction Unity of knowledge and action		.613	.165	.198	3.718	<.001	.383	.386
Like to sleep at leisure		-1.855	.681	.094	-2.724	.383		
Gender		-1.693	.629	-.091	-2.692	.007		
						.007		
Challenge-skill balance		.409	.166	.131	2.466	.014		
Father's occupation		.247	.112	.075	2.197	.028		
like to study at leisure		1.366	.640	.073	2.132	.033		

with Zhaoyuan Guo's research results [6]. It may be that for undergraduates, sleeping is a passive leisure activity, self-study is a positive and constructive leisure activity, and the other 15 leisure activities are neutral.

References

[1] Huidi Ma. Theoretical exploration of leisure issues[J]. Journal of Tsinghua University (Philosophy and Social Sciences Edition), 2001, 16 (6): 71-75.

[2] Saichan Huang. Research on the relationship between leisure satisfaction and subjective well-being of undergraduates[D]. Changsha: Hunan Normal University, 2010, 05.

[3] Lei Tan, Yu Liu. Research on the influence of undergraduate leisure activity participation on happiness[J]. Journal of Changchun University of Technology (Higher Education Research Edition), 2014, 35(4): 86-90.

[4] Bingzheng Hu. Research on the relationship between undergraduate leisure activities and stress, depression, well-being[J]. Chinese General Practice, 2015, 18(19): 2341-2345.

[5] Csikszentmihalyi M. Finding flow: The psychology of engagement with everyday life[M]. New York: Harper Collins, 1997, 71.

[6] Zhaoyuan Guo. The relationship between leisure flow experience, leisure experience and physical and mental health[D]. Taipei: National Political University, 2003, 05.

[7] Zhaojian Cai. Research on the relationship between leisure satisfaction, smooth experience and subjective well-being of the elderly[D]. Chongqing: Chongqing Normal University, 2014, 06.

[8] Yuannan Zheng, Yingxin Yuan, Xing Cao. Research on leisure sports participants' fluency, satisfaction and well-being from the perspective of leisure education[J]. Journal of Beijing Sport University, 2016, 39(1): 102-111.

[9] Xinggui Zhang. The relationship between the personality of young students and their subjective well-being[D]. Guangzhou: South China Normal University, 2003, 05.

[10] Xianhua Tian. The relationship between smooth experience in undergraduate leisure activities and physical and mental health[D]. Changchun: Northeast Normal University, 2010,05.

[11] Ying Xiong. Research on the relationship between leisure motivation, boredom and life satisfaction of undergraduate[D]. Shijiazhuang: Hebei University, 2017,05.

[12] Jiajia Ji, Yan Wu, Xuehong Tian. The relationship between undergraduate mobile phone dependence, academic delay and subjective well-being[J]. Journal of Hangzhou Normal University (Natural Science Edition), 2014, 13(5), 482-487.

[13] Waggstaff, A., Doorslaer, E. V. Income inequality and health: what does the literature tell us?[J]. Annual reeview of public health, 2000(21): 543-567.

Author Guidelines

This document provides some guidelines to authors for submission in order to work towards a seamless submission process. While complete adherence to the following guidelines is not enforced, authors should note that following through with the guidelines will be helpful in expediting the copyediting and proofreading processes, and allow for improved readability during the review process.

Ⅰ. Format

- Program: Microsoft Word (preferred)
- Font: Times New Roman
- Size: 12
- Style: Normal
- Paragraph: Justified
- Required Documents

Ⅱ. Cover Letter

All articles should include a cover letter as a separate document.

The cover letter should include:

- Names and affiliation of author(s)

The corresponding author should be identified.

Eg. Department, University, Province/City/State, Postal Code, Country

- A brief description of the novelty and importance of the findings detailed in the paper

Declaration

v Conflict of Interest

Examples of conflicts of interest include (but are not limited to):

- Research grants
- Honoria
- Employment or consultation
- Project sponsors
- Author's position on advisory boards or board of directors/management relationships
- Multiple affiliation
- Other financial relationships/support
- Informed Consent

This section confirms that written consent was obtained from all participants prior to the study.

- Ethical Approval

Eg. The paper received the ethical approval of XXX Ethics Committee.

- Trial Registration

Eg. Name of Trial Registry: Trial Registration Number

- Contributorship

The role(s) that each author undertook should be reflected in this section. This section affirms that each credited author has had a significant contribution to the article.

1. Main Manuscript

2. Reference List

3. Supplementary Data/Information

Supplementary figures, small tables, text etc.

As supplementary data/information is not copyedited/proofread, kindly ensure that the section is free from errors, and is presented clearly.

Ⅲ. Abstract

A general introduction to the research topic of the paper should be provided, along with a brief summary of its main results and implications. Kindly ensure the abstract is self-contained and remains readable to a wider audience. The abstract should also be kept to a maximum of 200 words.

Authors should also include 5-8 keywords after the abstract, separated by a semi-colon, avoiding the words already used in the title of the article.

Abstract and keywords should be reflected as font size 14.

Ⅳ. Title

The title should not exceed 50 words. Authors are encouraged to keep their titles succinct and relevant.

Titles should be reflected as font size 26, and in bold type.

Ⅳ. Section Headings

Section headings, sub-headings, and sub-subheadings should be differentiated by font size.

Section Headings: Font size 22, bold type

Sub-Headings: Font size 16, bold type

Sub-Subheadings: Font size 14, bold type

Main Manuscript Outline

Ⅴ. Introduction

The introduction should highlight the significance of the research conducted, in particular, in relation to current state of research in the field. A clear research objective should be conveyed within a single sentence.

Ⅵ. Methodology/Methods

In this section, the methods used to obtain the results in the paper should be clearly elucidated. This allows readers to be able to replicate the study in the future. Authors should ensure that any references made to other research or experiments should be clearly cited.

Ⅶ. Results

In this section, the results of experiments conducted should be detailed. The results should not be discussed at length in

this section. Alternatively, Results and Discussion can also be combined to a single section.

Ⅷ. Discussion

In this section, the results of the experiments conducted can be discussed in detail. Authors should discuss the direct and indirect implications of their findings, and also discuss if the results obtain reflect the current state of research in the field. Applications for the research should be discussed in this section. Suggestions for future research can also be discussed in this section.

Ⅸ. Conclusion

This section offers closure for the paper. An effective conclusion will need to sum up the principal findings of the papers, and its implications for further research.

Ⅹ. References

References should be included as a separate page from the main manuscript. For parts of the manuscript that have referenced a particular source, a superscript (ie. [x]) should be included next to the referenced text.

[x] refers to the allocated number of the source under the Reference List (eg. [1], [2], [3])

In the References section, the corresponding source should be referenced as:

[x] Author(s). Article Title [Publication Type]. Journal Name, Vol. No., Issue No.: Page numbers. (DOI number)

Ⅺ. Glossary of Publication Type

J = Journal/Magazine

M = Monograph/Book

C = (Article) Collection

D = Dissertation/Thesis

P = Patent

S = Standards

N = Newspapers

R = Reports

Kindly note that the order of appearance of the referenced source should follow its order of appearance in the main manuscript.

Graphs, Figures, Tables, and Equations

Graphs, figures and tables should be labelled closely below it and aligned to the center. Each data presentation type should be labelled as Graph, Figure, or Table, and its sequence should be in running order, separate from each other.

Equations should be aligned to the left, and numbered with in running order with its number in parenthesis (aligned right).

Ⅻ. Others

Conflicts of interest, acknowledgements, and publication ethics should also be declared in the final version of the manuscript. Instructions have been provided as its counterpart under Cover Letter.

Journal of Psychological Research

Aims and Scope

Journal of Psychological Research publishes original research papers that offer a rapid review and publication that freely disseminates research findings in all areas of Psychology including Clinical Psychology, Cognitive Neuroscience, Applied Psychology, Mathematical Psychology and more . The Journal focuses on innovations of research methods at all stages and is committed to providing theoretical and practical experience for all those who are involved in these fields.

Journal of Psychological Research aims to discover innovative methods, theories and studies in Psychology by publishing original articles, case studies and comprehensive reviews.

The scope of the papers in this journal includes, but is not limited to:

- Cognitive Neuroscience
- Clinical Psychology
- Biological Psychology
- Educational Psychology
- Social Psychology

- Applied Psychology
- Mathematical Psychology
- Developmental Psychology
- Experimental Psychology
- Psychoanalysis

About the Publisher

Bilingual Publishing Co. (BPC) is an international publisher of online, open access and scholarly peer-reviewed journals covering a wide range of academic disciplines including science, technology, medicine, engineering, education and social science. Reflecting the latest research from a broad sweep of subjects, our content is accessible world-wide——both in print and online.

BPC aims to provide an analytics as well as platform for information exchange and discussion that help organizations and professionals in advancing society for the betterment of mankind. BPC hopes to be indexed by well-known databases in order to expand its reach to the science community, and eventually grow to be a reputable publisher recognized by scholars and researchers around the world.

BPC adopts the Open Journal Systems, see on ojs.bilpublishing.com

Database Inclusion

Asia & Pacific Science Citation Index

Creative Commons

China National Knowledge Infrastructure

Google Scholar

Crossref

MyScienceWork