

INTRODUCTION

In recent years, interest has grown in the systematic assessment of the effectiveness of avatar-based learning (ABL). Literature has shown past success within clinical settings in aiding various clients, Cerulean is now interested in translating the outcomes into corporate learning settings, covering challenging topics such as bullying and harassment. However, research thus far has lacked in robust empirical investigation into assessing the efficacy of ABL. In order to identify desired outcomes and be able to operationalize effectiveness, this literature review proposes methodology and/or frameworks to test and assess whether ABL learning scenarios can improve outcomes in learning and development interventions around sensitive topics. Findings indicate that three categories of desired outcomes can be distinguished in ABL, they are learning, motivation and efficiency outcomes. Much of the literature use self-reported questionnaire and self-report surveys, however these methods have limitations. Therefore, to overcome these shortcomings, the present literature review presents an appropriate conceptual framework and methodology for assessing effectiveness of ABL.

GAMIFICATION IN THE CURRENT WORLD

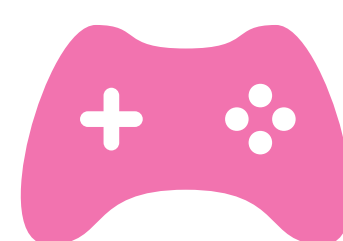
WHAT IS IT ?



- Psychological predisposition to engage in gaming + mechanisms that game designers have applied in making video games + real world activities = possible means to make real world activities more engaging (Larson, 2020)
- The benefits and potential of gamification presents opportunities in areas such as innovation, training and education, performance improvement and production in the corporate environment.
- Is there a way to capitalize on the affordances of gamification based on nongame applications?



Vynz Research (2018) valued the **global gamification market at \$4.3 billion**



A staggering estimated **40%** of the largest **1000 global organizations** applied gamification strategies to their enterprise activities (Blohm & Leimeister, 2013)



An anticipated growth in the enterprise market of **6%** by the **year 2024**.

E.G. SENSITIVE TOPIC + GAMING INTERVENTION (Shields et al., 2018)

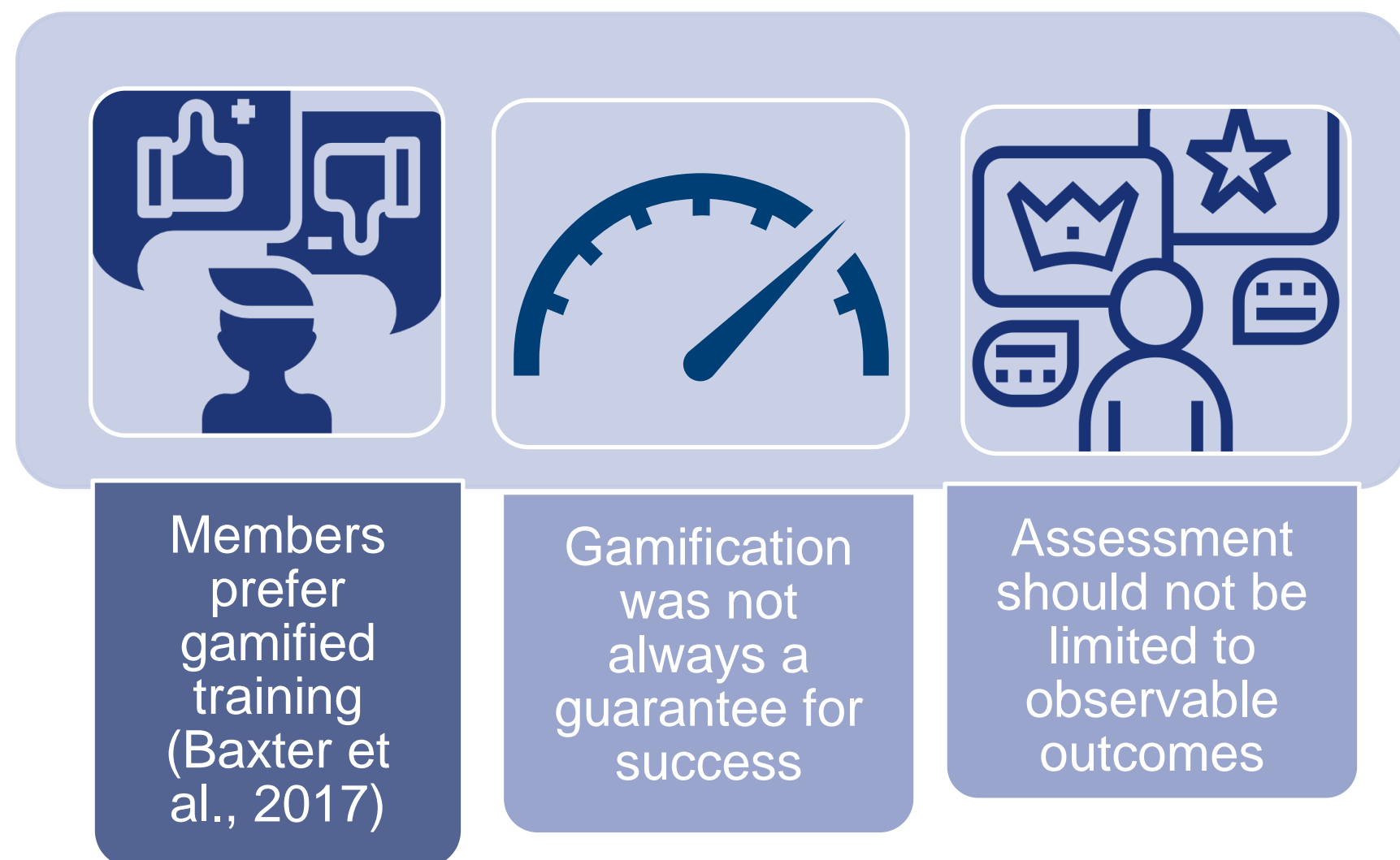
- The authors investigated the efficacy of WAGES-Business (Workshop Activity for Gender Equity Simulation)
- WAGES-Business presented scenarios of unconscious gender bias in business in a game setting
- Assessed the impact on the participant's willingness to confront bias, concern about bias, willingness to discuss, self-efficacy.
- Participants were more likely to endorse statements that the effect of many small incidents of gender inequity are cumulatively harmful.
- 57% indicated that WAGES led to behavioural changes and insightful thoughts.



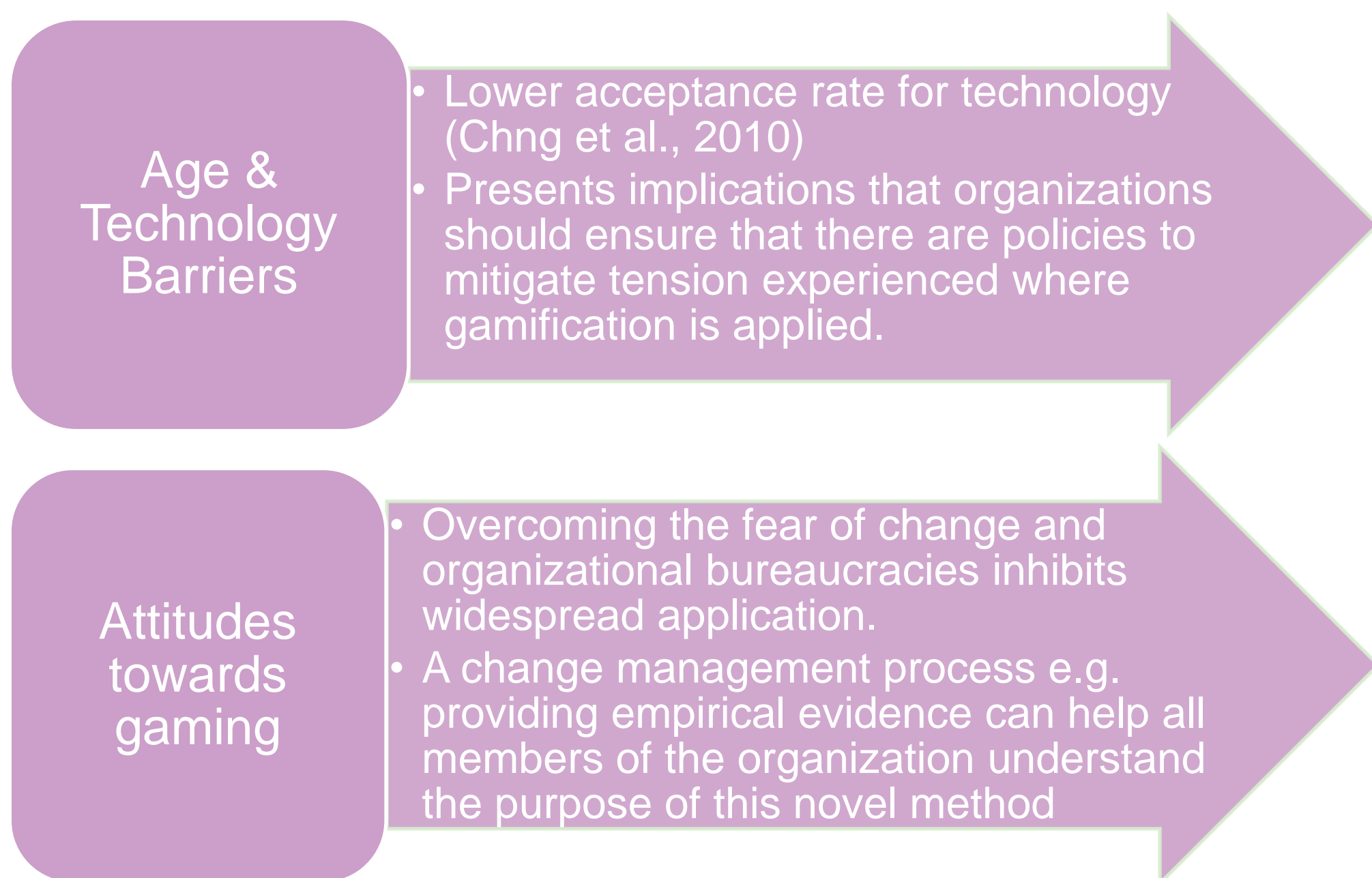
IMPLICATIONS

THE EFFICACY OF GAMING

- The academic literature has revealed inconsistent and contradictory results
- A critical finding was that the integration of gamification was not always a determinant for an increase in the ability to perform or display particular ascribed skills (Larson, 2019).
- This finding, whilst preliminary, also suggests that the efficacy of the intervention should not be limited to tangible outcomes as success may be manifested in different forms.
- The literature provides support for the conceptual premise that gamification has the potential to increase the capability of a workforce via an increase of self-efficacy.



Factors to take into consideration



Evaluation Framework for ABL effectiveness

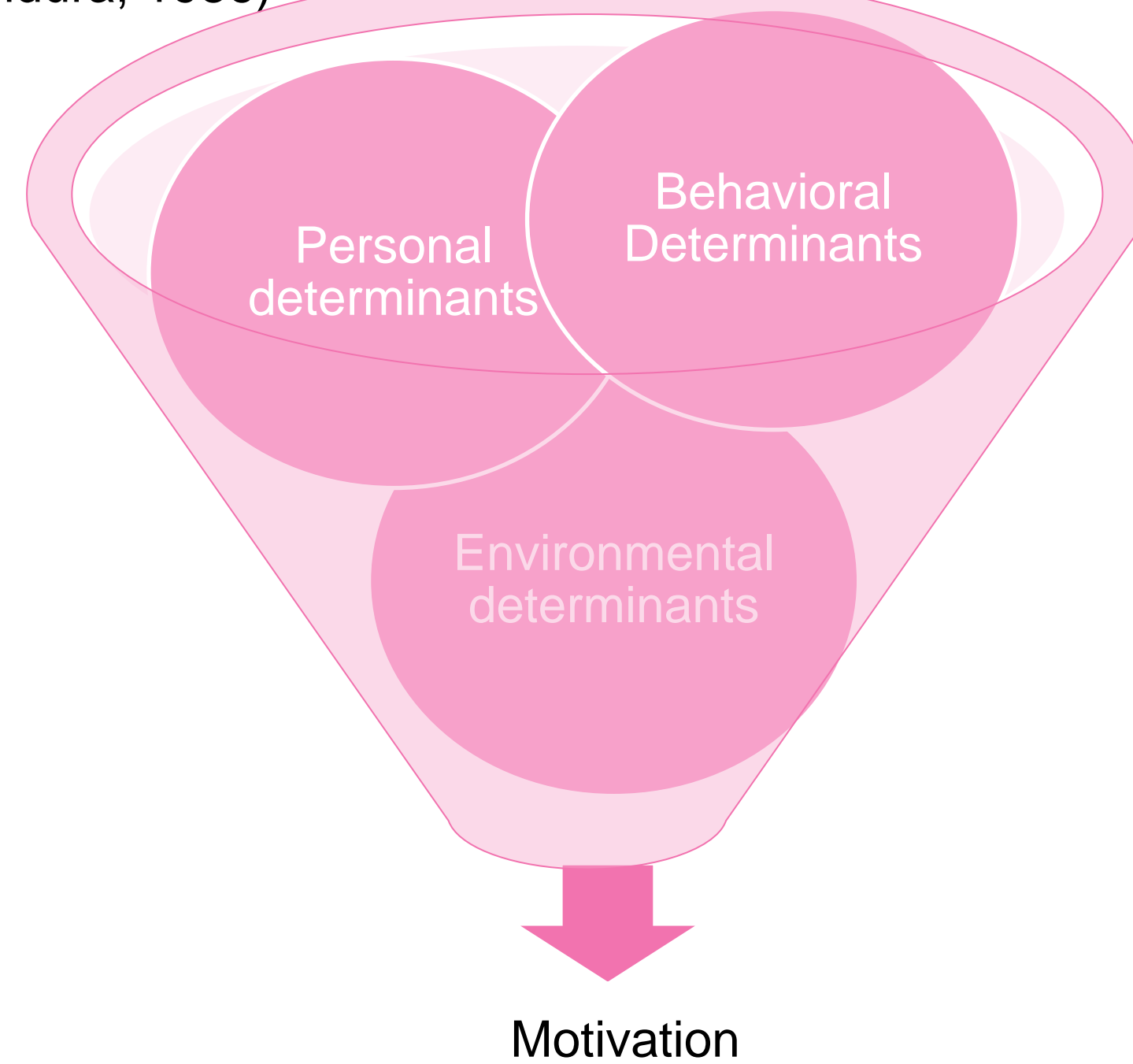
Multidimensional Conceptualization of ABL effectiveness (All et al., 2015)

Learning Outcomes:	Motivational Outcomes:	Efficiency Outcomes:
1. Situational Interest 2. Performance 3. Transfer	1. Enjoyment 2. Motivation towards ABL	1. Time Management 2. Cost-effectiveness

RECOMMENDATIONS

What does Social Cognitive Theory (SCT) tell us?

- According to SCT, motivation for exhibiting a certain behavior is a result of an interaction between three components.
- The influence of environmental determinants is an indirect influence via psychological mechanisms of the self-system
- "What people think, believe and feel affects how they behave" (Bandura, 1986)



Alternative methodological approach

- Technology Applied learning – An alternative approach to evaluating learning outcomes
- Shields et al (2018) Incorporated more open-ended questions that was shown to validate many participants experiences and observations about unconscious bias
- Sender et al (2021) used social cognitive theory (SCT) as a theoretical framework (Bandura, 1986) to conceptualize and operationalize effectiveness in Digital Game Based learning because this theory provides a framework of effectiveness evaluation linked to actual behavioral intention as a result of the learning intervention.
- According to Scherbaum and Meade (2013), excessive use of a limited set methods, and the survey is one of the most used for decades.
- (Cullen, 2017) self-report instruments have shortcomings and are susceptible to design flaws that may jeopardize research findings by providing "an inaccurate roadmap of where the problems lie" Need for different methodology.

Sentiment & Narrative Analysis

- Sender et al (2021) used to capture complex phenomenon
- Sentiment Analysis is a research field of Natural Language Processing (NLP)
- (Liu, 2020) NLP is a computerized approach focused on analyzing text based on both a set of theories and a set of technologies (Liddy, 2001).
- It aims to analyze feelings, emotions, and opinions within unstructured data based on a polarized classification of the sentiment present in a document or a sentence.
- (Colditz et al., 2019 Kouloumpis et al., 2011 etc), also used in health services contexts like patient narratives (Stuary et al 2018) and clinical narratives (Denecke & Deng, 2015)
- More recently it has been applied to studies in organizational culture (Pandey & Pandey, 2019) and job performance (Speer, 2020)

Implicit Association Task (IAT)

- Administered via a computer program that delivers a sequence of discrimination tasks to participants and their reaction times to each are recorded (Greenwald et al., 1988)
- Participants sort the computer-generated words by rapidly pushing a key on either the right or left side of the keyboard, Faster reaction times between a concept and an attribute indicates a stronger implicit association (Greenwald & Farnham, 2000)

CONCLUSION

Implicit Association Task (IAT)

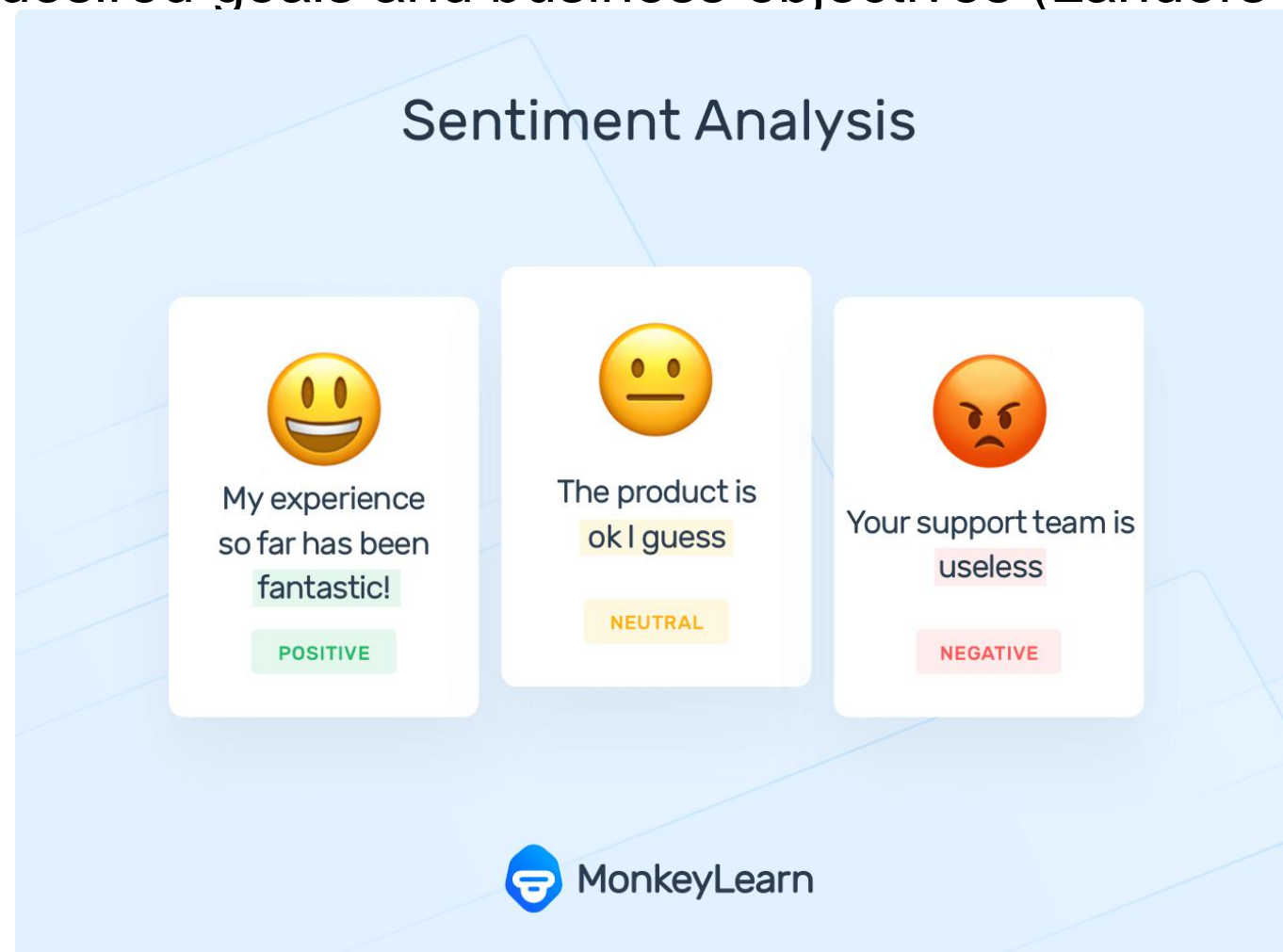
- Has been subjected to controversy around its construct validity but has demonstrated good validity and reliability.
- It can be adapted to assess a multitude of constructs including sensitive topics
- Designed to measure implicit cognitions and overcome some of the shortfalls of self-report measures (i.e. lack of self-awareness, social desirability)

Sentiment & Narrative Analysis

- Converts employee narratives about interventions into quantifiable indicators.
- This alternative approach is more comprehensive for complex phenomenon
- Avoids shortcomings of largely using self-report instruments e.g. questionnaires
- Offers a way of adopting the use of sentimental analysis in corporate settings

Key Takeaway

- The evaluation framework can be utilized to guide designs and implementation of ABL to maximize learning outcomes whilst addressing psychological needs of a workforce.
- IAT or Sentiment & Narrative Analysis are viable options for organizations to decide which methodology would be more suitable for meeting their needs and preferences
- Most importantly, these findings indicate a directive to align business objectives and key performance indicators to ABL, however this approach should not be applied due to availability, but rather because it supports desired goals and business objectives (Landers & Armstrong, 2011)
- An example of Sentiment Analysis being used is MonkeyLearn in customer feedback



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