Applying dual-frameworks of motivation and regulation to theories of ageing and psychological engagement: A review with future research directions

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A number of dual-systems frameworks have emerged over time to inform theory and practice regarding the conceptualisation and assessment of human motivation and regulation. These dual systems are unique in their own ways but share common elements of one system controlling upregulation of and another system controlling downregulation of emotional, cognitive, and behavioural processes. This article reviews these various dual-frameworks and offers future research directions for scholars in using their associated measurements. Specifically, psychology within the domains of work and aging, respectively, are used as exemplar fields that can benefit by better accounting for individual differences within their research utilising these dual-system frameworks of motivation and regulation.

Keywords: dual-systems framework; emotional regulation; job engagement; motivation; neuropsychology

Human motivation is one of the most ubiquitously studied topics within psychology. Motivation has been defined as an unobservable, dynamic force propelling cognitive, emotional, and behavioural experiences (Austin & Vancouver 1996; Cerasoli et al., 2014; Diefendorff & Chandler, 2011). Indeed, the processes by which individuals regulate and achieve goals are determinant of key outcomes like job performance and wellbeing (Vancouver & Kendall, 2006; Deci et al., 2017). However, motivation is a broad and overarching term for an array of dispositional and environmental characteristics that drive effort toward goal attainment, thus there are a variety of lenses for understanding motivational and regulatory processes (Kanfer et al., 2017). Specifically, there are a number of dual-frameworks that account for individual differences in motivational and regulatory functioning underpinned by systems for upregulation and downregulation that orient patterns of cognition, affective experience, and action (Gray, 1981; Kuhl, 1994a; Metcalfe & Mischel, 1999). Research examining such systems has demonstrated that individuals vary in their job search patterns and ability to attain interviews, the extent to which they perform helping behaviors, and reactions to different environmental stressors based on their innate motivational preferences towards generativity and reduction (Sun et al., 2013; Gabriel et al., 2017; Ferris et al., 2016). Indeed, the application of such motivational frameworks is imperative for explaining various psychological effects and phenomena based on universal systems with degrees of variation among people. This paper reviews some of the literature on dual-frameworks surrounding motivation and regulation and offers research applications of said frameworks using theories from industrial-organizational psychology and lifespan development psychology, which include work engagement theory and socioemotional selectivity theory, respectively (Kahn, 1990; Carstensen et al., 2011).

Theories of job engagement have been extremely influential in terms of understanding wellbeing and performance at work within industrial-organizational psychology (Kahn, 1990; Schaufeli et al., 2002; Rich et al., 2010; Christian et al., 2011). Job engagement stipulates that individuals invest their personal self into their work simultaneously using emotional, cognitive, and physical resources, which helps to maximize work outcomes for both the individual and their organization of membership (Kahn, 1990; Schaufeli et al., 2002). Recent research has demonstrated that job engagement is subject to change across tasks, where consecutive experiences of engagement can have both deleterious and positive cognitive and emotional effects between tasks (Newton et al., 2020). Dual-frameworks of motivation are useful for understanding who will most benefit from consecutive experiences of engagement, and who will be most taxed by these experiences. This paper considers potential research questions using dual-frameworks of motivation that may account for individual differences in consecutive task engagement experiences.

The other theory that this paper seeks to apply dual-frameworks of motivation is socioemotional selectivity theory and its well-documented positivity effect (Lang & Carstensen, 2002; Mather & Carstensen, 2003; Carstensen et al., 2011). Socioemotional selectivity theory emphasizes that the way people perceive time throughout their life determines their social goals, such that those who perceive time as abundant will pursue novel experiences and social situations, while those who perceive time as limited will gravitate towards the familiar (Carstensen et al., 1999). Psychological and neurological research propelled by socioemotional selectivity theory has found consistent support for the existence of an age-related positivity effect, where individuals transition from viewing time as a plentiful resource in youth towards viewing time as a limited resource in later adulthood that subsequently facilitates an attentive shift towards increased stimulation and regulation of positive emotion (Caciopo et al., 2011; Isaacowitz & Blanchard-Fields, 2012; Reed et al., 2014; Kennedy et al., 2019). However, despite the theory and studies supporting the occurrence of a positivity effect, little research has examined the individual difference factors that may augment or reduce its occurrence, thus this review offers future directions for lifespan psychology and cognition researchers by considering how dual-frameworks of motivation can account for emotional regulatory changes over time (Stanley & Isaacowitz, 2011; Isaacowitz & Blanchard-Fields, 2012; Reed et al., 2014).

The fundamental 'hot-go and cool-know' system

The dual-frameworks of emotion and motivation regulation exhibit a fundamental structure composed of an upregulating and a downregulating system, which can be measured as resting on the same or separate continuums (see Table 1). The hot-go and cool-know framework (Metcalfe & Mischel, 1999) is a popular example of such dual-systems exemplified in the marshmallow experiment testing the willpower of young children, where their ability to exercise willpower for greater reward predicted future performance decades later. The experiment demonstrated that children who are offered marshmallows and are able to restrain themselves from eating those marshmallows for a time period in exchange for more marshmallows later are exercising their knowledge-based cooling system. This helps to attenuate the stimulation of their primal-driven hot system's need for self-gratification and positive experience.

Table 1
Summary of dual-motivation frameworks

Framework	Description	Generative component	Reductive component
Hot/Cool	Motivation and regulation are guided by an emotion-based 'hot-go' system and a knowledge-based 'cool-know' system.	'Hot-go' system that is emotionally and impulsively driven. Rooted in the amygdala and hypothalamus. Motivated towards self-gratification, stimulation, and natural hedonic tendencies.	'Cool-know' system that is driven by cognition and higher order judgement. Rooted in the frontal lobe and hippocampus. Motivated towards attenuation of stress and reactiveness.
Behavioural activiation/inhibition	Motivation and regulation are guided by a reward-driven behavioural activiation system and a punishment-mitigating behavioural inhibition system.	Behavioural activation system that is reactive toward reward, achievement, and positive emotion. Sensitive towards excitatory states.	Behavioural inhibitoin system that is reactive to negative stimuli and anxiety-provoking experiences. Reactive to threats and geared towards defensiveness. Driven to reducing activity levels and stimulation.
Approach/avoidance	Motivation and regulation are guided by the exten one is prone towards approaching positive outcomes and simultaneously avoiding negative outcomes	Approach-based orientatition that emphasises attainment of positive outcomes, events, and resource gain. Motivated towards pleasurable experiences and emotions.	Avoidance-based orientation that emphasises the prevention of negative outcomes, events, and resource loss. Motivated to stop undesirable experiences and emotions.
Action/state	Single system on a polar continuum indication how prone an individual is towards actively striving for achievemen on one end versus preoccupation with one's own train of thought on the other. Both ends of the continuum can vary in dimension of decision towards generating positive affect or failure to reduce negative affect.	Action orientation that is geared to reduce deficits between current and desired states. Captures volition, achievement, and goal-directed behaviour.	State orientation that is geared towards allocating cognitive resources and thinking, and reduce goal-striving behaviour. Captures self-preoccupation, thinking, and rumination.

The parallel of an aroused system driven by impulse and a restrained system driven by thinking is a basic illustration of a number of emotional-motivational regulatory frameworks that capture how individuals differ in their cognitive-affective, goal-achieving processes facilitating behaviour. These systems are endogenous to neuroendocrinology, such that they parallel the sympathetic and parasympathetic nervous systems, and the limbic system′s regulation of the hypothalamus and amygdala in states of arousal and stress by triggering a neurohormonal response and the release of cortisol via the pituitary gland (Reeve & Tseng, 2011; Charles & Luong, 2013). Indeed, it is easy to imagine that these universal systems vary among people in terms of their innate generative and reductive processes.

Neuropsychological systems of behavioural activation and inhibition

The reactive motivation framework (Gray, 1981) describes another dual-system of behavioural activation and behavioural inhibition. An individual′s behavioural activation system (BAS) is primarily sensitive to stimulation, while one′s behavioural inhibition system (BIS) is focused on attenuation and mitigation of stressful states. Individuals with high BAS sensitivity are more likely to be bored and under-stimulated, which may lead them to engage in uninhibited and impulsive behaviours that are gratifying and generate positive emotion (Diefendorff & Mehta, 2007). By contrast, BIS-prone individuals are more likely to experience anxiety and negative emotion as they emotionally regulate and reduce activation elicited by psychological or environmental stressors. This framework parallels the one by Metcalfe and Mischel (Metcalfe & Mischel, 1999) as their hot-go system corresponds to BAS, given that they encompass systems driven by stimulation, such as a child in the marshmallow experiment who wishes instant satiation by

immediately consuming the offered marshmallow, where such activation is rooted in more primitive brain structures, such as the amygdala and cerebellum. In contrast, the cooling knowledge-based system is similar to BIS wherein control of stimulation reduction is made possible by elaborated cognitive and knowledge-based structures, which correspond more towards evolutionarily developed brain structures, such as the hippocampus and frontal lobe that permit for abstract thinking and higher order judgement. However, BIS is still rooted in primitive brain structures given its greater association with fear, anxiety, and the parasympathetic nervous system.

Research has provided support for psychological measures that tap into the BIS and BAS constructs accounting for emotional and motivational differences among individuals. Richard and Diefendorff (Richard & Diefendorff, 2011) conducted a study examining mood-as-information during goal striving episodes, where individuals were to complete tasks over a period of time without external or social feedback using a daily diary methodology. They found that individuals higher in BIS sensitivity were more likely to make goal revisions when they experienced positive emotion during goal striving, given that such feelings are more alien to BIS sensitive individuals and informative to them relative to BAS sensitive ones. Surprisingly, higher BAS sensitive individuals did not end up exhibiting the opposite effect, but instead were also found to revise goals during positive affective time periods as it is a fueling resource for them to achieve outcomes compared to negative experiences. Research has also found that BIS activation triggers anxiety and defensiveness, while BAS activation triggers goal striving (Nash et al., 2011). Furthermore, Ferris and colleagues (Ferris et al., 2019) found that the presence of negative stimuli, such as abuse by one′s supervisor, is more detrimental to highly BIS sensitive people, while the absence of positive stimuli, such as not being included socially, is more detrimental to highly BAS sensitive individuals. These findings help to illustrate one of many dual-frameworks that account for the ways in which people are uniquely reactive in their motivation and emotion regulation.

The approach-avoidance framework

Approach-avoidance motivation is a trait-based, dual-framework of motivation that captures the extent to which individuals desire to generate positive outcomes and gain of resources as well as avoid negative outcomes and loss of resources (Elliot, 2006). These two forms of motivation are not exclusive to one another and are generally considered to map onto separate continuums, where a person may simultaneously be high, low, balanced, or hold other varying combinations of approach and avoidance tendencies (Diefendorff & Mehta, 2007). Byron and colleagues (Byron et al., 2018) describe approach and avoidance orientations, and their distinctions. They depict an individual 's approach orientation as encompassing the extent to which they are motivated by the attainment of resources, which may include physical objects, such as money, less tangential ones, such as time, and situations or events, such as a job promotion. In contrast, avoidance orientations are characterized by a motivation to avoid undesirable outcomes resulting in a loss of resources, such as uncertain situations or experiences of unnecessary strain. This paradigm model of motivation is generally considered to be synonymous with other dual-frameworks, such as regulatory focus theory′s promotion and prevention orientation (Higgins, 1998), along with the aforementioned BIS and BAS orientations of reinforcement sensitivity theory, which is at the theoretical core of the approach-avoidance framework (Gray, 1981; Diefendorff & Mehta, 2007).

Research has demonstrated that measurements of approach and avoidance among individuals show clear differences with regards to emotional and motivational outcomes. A study by Gabriel and colleagues (Gabriel et al., 2017) found that those high in avoidance orientation are more concerned with and sensitive to preventing the loss of resources for the sake of maximizing personal wellbeing, such that highly avoidant employees who engaged in helping behaviours over time transitioned towards being less helpful to prevent fatigue compared to those who are less avoidant. Research by Robinson and colleagues (Robinson et al., 2016) demonstrated the impact of individual differences in approach and avoidance motivation with regards to emotional reactions towards various provocations; their two studies consisted of a computer simulation trial and a daily diary measure assessing reactions to conflict, where approach-based individuals exhibited greater anger reactivity to daily negative events. Yip and colleagues (Yip et al., 2020) conducted a study that found emotional intelligence plays a critical role in interpreting physiological sensation and response, where those higher in emotional intelligence do not misinterpret approach-based physiological signals and are more likely to avoid risk by not engaging their impulsive reactions as readily. Indeed, the extent to which one is geared towards attaining positive outcomes and reducing the occurrence of negative outcomes has implications for both emotional and behavioural experiences.

Theory of action control

Kuhl′s (Kuhl, 1994a) theory of action control describes the extent one has an action or a state orientation, which similarly mirrors the framework presented by Metcalfe and Mischell (Metcalfe & Mischell, 1999). Action and state orientation exist on the same continuum but can differ in dimensions of failure and decision. Action orientation encompasses how driven someone is towards pathways that reduce deficits between current and desired states, thus it is characterized as volitional and is similar to the hot-go system, approach motivation, and BAS. Those with an action orientation tend to exhibit more goal-striving behaviour that is efficient and high performing in their attainment of outcomes (Diefendorff et al., 2000).

In contrast, having a state orientation is characterised by cognitive preoccupation with perceptions of oneself, which ultimately attenuate goal striving and instead allocate cognitive resources to thinking and strategizing, thus resembling the cool-know system, avoidant motivation, and BIS. Kuhl (Kuhl, 1981) described state orientation as cognitive processes focused on one's past, present, or future state of being. This may hinder cognitive activities dedicated towards action and performance as one becomes immersed in pondering why they have not mitigated the discrepancy between current and desired outcomes. The diversion of cognitive resources away from goal-directed behaviour and instead towards preoccupation with one's thoughts and affect reduces the effectiveness of striving for and attaining desired outcomes, thus reducing one's overall volition (Diefendorff et al., 2000). These orientations, which exist on opposite ends of the same continuum, show differences across two dimensions: decision and failure relation.

Decision-related action orientation is the extent that one's action state is able to generate positive affective experiences when goal-striving, especially in facing challenging tasks or obstacles. Decision-related state orientation is the polar opposite and characterized by impairment in generating positive affect. Research has found support for those high on decision-related action orientation as being better equipped to self-motivate in order to achieve outcomes in the face of stressful demands (Baumann et al., 2005). Failure-related action orientation is the extent one's action state is able to mitigate negative affective experiences when goal-striving, which ultimately allows one to disengage from impeding or disruptive thought processes, while failure-related state orientation is characterized as being unable to manage one′s preoccupation with negative affect. Research has found support that individuals high in failure-related action orientation are not as disconcerted by negative experiences or stimuli that may otherwise impede their goal pursuit.

Although some of the associations described with these dimensions as they relate to emotion regulation may appear similar to more popular variables, support has been provided for measurements of action orientation as a distinct construct relative to other affective indicators. Specifically, traditional personality variables like extroversion or neuroticism have accounted for the extent one may generate positive affect or negative affect (Brebner et al., 1995; Diener & Seligman, 2002; Judge & Ilies, 2002). However, research examining the validity of the action-control scale has shown that big-five personality measures account for no more than 28% of the variance in any of the action-control scale subscales (Diefendorff et al., 2000). Clearly, action-state orientation provides an important, unique motivational framework for assessing individual differences in emotion regulation and motivation within goal-driven processes beyond other dispositional characteristics accounting for cognitive, affective, and behavioural regulation like personality.

Work engagement and motivation research

Job engagement is considered one of the most popular and powerful constructs among motivation scholars and practitioners within the realm of industrial-organizational psychology. The pervasiveness of job engagement within both theoretical and applied contexts is only matched by its broadness as a definition, where scholars have lamented that it is an umbrella construct for multiple factors studied within applied motivation at work, such as organizational commitment, job involvement, and job satisfaction (Saks, 2008; Schaufeli, 2013). Despite any perceived conflation with other variables, engagement is generally thought of as a positive motivational state where an individual immerses themselves cognitively, physically, and emotionally in their work (Byrne et al., 2016; Schaufeli, 2013). Indeed, much research has provided support for the importance of job engagement as a distinct, antecedent construct above and beyond traditional predictors of motivation and job performance (Hakanen et al., 2006; Rich et al., 2010; Schaufeli, 2013).

There is nearly universal agreement that job engagement is good for both employees and organizations (Salanova et al., 2011). Specifically, engaged employees tend to exhibit higher positive affect more than disengaged employees. One study sought to examine engagement from a resource-based framework, where support was found for engaged employees expending less cognitive resources than disengaged employees, where less resource expenditure mitigated detrimental impact to positive affect and performance (Kim et al., 2018). Unsurprisingly, measures of job engagement include items that directly tap into experienced positive affect (Rich et al., 2010).

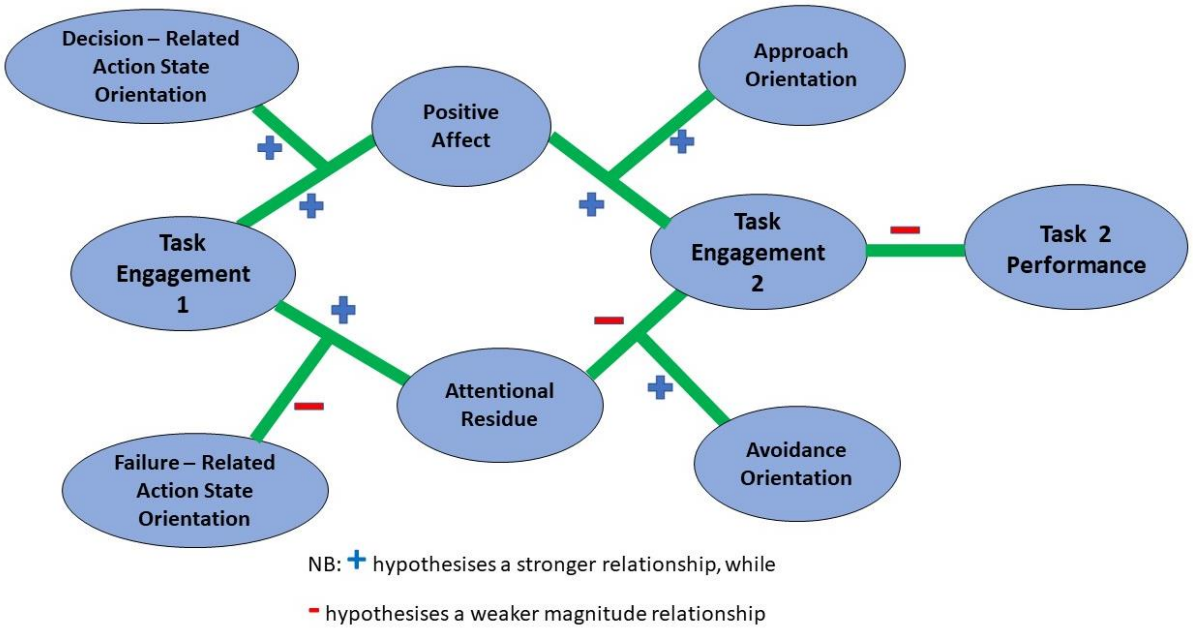
Despite the prevalent literature indicating that engaged employees generally have positive experiences, modern research has found support for costs associated with engagement processes. A recent exploration examined both the beneficial and harmful pathways involved within the spill over of engagement on one task to a subsequent task through separate studies assessing undergraduate students in a laboratory setting and NASA crew members (Newton et al., 2020). Support was found for a positive spill over effect of task engagement on subsequent task engagement via feelings of positive affect, but also a negative toll on subsequent engagement via attention residue, which encompasses the degree one's cognitive and attentional resources are preoccupied with a previous task (Leroy, 2009). In other words, pleasant emotion that is stimulated when engaged on one task spills over to facilitate engagement on a different subsequent task, but the investment and depletion of attentional resources on the initial task simultaneously mitigates or decreases the positive impact of engagement on subsequent tasks.

Using dual-frameworks of motivation for future research examining individual differences in work engagement

Findings such as those of Newton's group (Newton et al., 2020) are important as they shed contrary insight into potentially universal processes of motivation, such as engagement on one task as it relates to engagement on a subsequent task, where it is not entirely beneficial as predominantly posited (Schaufeli, 2013). However, they did not capture varying individual traits that explain who does or does not benefit from positive affect or attention residue during subsequent task engagement, which incites questioning as to the generalisability of the examined spillover processes. Indeed, dual-frameworks of motivation can help account for who will experience the most and least positive and negative effects of consecutive engagement with work tasks.

In the model of Newton and colleagues (Newton et al., 2020), it was found that positive affect and attention residue predicted by the engagement on an initial task impacted engagement on a subsequent task, thus it is important to elaborate on this model by accounting for individual trait-based differences in emotion and motivation regulation, such as one's action orientation, and one's approach and avoidance orientations (Kuhl, 1994a; Diefendorff et al., 2000; Diefendorff & Mehta, 2007). Indeed, scholars have called for integration of theory less explored in job engagement research (Rich et al., 2010; Schaufeli, 2013), such that these dual-frameworks can help to explain differences in the mechanisms of attention residue and positive affect within engagement spill over (Figure 1) (Newton et al., 2020).

Figure 1
Conceptualised model accounting for positive and negative pathways between consecutive engagement experience with work tasks.



Newton and colleagues (Newton et al., 2020) found that engagement on an initial task elicited both beneficial and costly mechanisms towards engagement on a subsequent task. These mechanisms include positive affect, which has been well studied as a feeling of pleasant activation (Russell & Barrett, 1999), and attention residue, which is the extent to which one is preoccupied with a previous task that mitigates engagement on a subsequent task (Leroy & Glomb, 2018). The extent to which engagement on an initial task produces positive affect should vary depending on one's ability to generate positive affective experiences towards subsequent tasks and goals, thus, using Kuhl's (Kuhl, 1994a) framework, decision-related action orientation should moderate the relationship between engagement with an initial task and subsequent positive affect, where that relationship will be strongest when an individual high on decision-related action orientation would be most predisposed towards generating positive emotion during goal striving processes. In replicating and extending Newton and colleagues' (Newton et al., 2020) original work, the enhanced positive affect from decision-related action orientation on initial task engagement should help to increase subsequent task engagement, where task one engagement will have a positive indirect effect on task two engagement and performance through positive affect when decision-related action orientation is high (Baumann et al., 2005).

In contrast to positive affect, attention residue is the costly mechanism that hurts subsequent engagement from the diversion of cognitive resources spent ruminating on initial task engagement. Understandably, given that preoccupation with thoughts is associated with negative affective experiences and that attention residue hinders performance, one's ability to mitigate negative experiences during goal-striving processes and disengage from less relevant tasks should moderate the extent one is cognitively preoccupied with a previous task (Kuppens et al., 2010; Leroy & Glomb, 2018).

Individual differences in approach orientation should account for variations in positive affect resulting from an initial task engagement on subsequent task engagement, such that those who are driven by high stimulation and positive experiences will be more propelled towards states of engagement (Barclay & Keifer, 2014). In other words, positive emotion from initial task engagement should have a positive effect on task two engagement when one is higher in approach orientation given that highly approach-driven individuals thrive off positive stimulation and sensation (Elliot, 2006). Simultaneously, given avoidance orientation's emphasis on mitigating negative affective experiences, it is reasonable to posit that those with a high avoidance orientation are primed to experience lesser engagement on a subsequent task as a result of the undesirable attention residue from a prior task that they are actively motivated to mitigate. Ultimately, attention residue is composed of negative affective cognitive processes, such as rumination and preoccupation with thoughts (Kuppens et al., 2010), thus an individual who is primarily concerned with preventing negative experiences will be ineffective at self-immersion in subsequent task engagement as they are motivated to resolve residual negative emotion from engagement with the initial task.

Socioemotional selectivity theory, time perspectives, and positivity effects

Socioemotional selectivity theory is a metatheory of social motivation that helps to account for the natural shift in social partner selection throughout the human lifespan. The theory rests on the idea that people are autonomously motivated towards achieving multiple social goals for the sake of adaptation (Carstensen et al., 1999). The social goals emphasized within socioemotional selectivity theory can be considered dichotomous, where social goals can primarily be oriented towards either novelty or familiarity (Fredrickson & Carstensen, 1990). People may be motivated towards novel social experience for the sake of knowledge acquisition, diversity in social interaction, and achievement of more instrumental outcomes. Conversely, people may be motivated towards familiar social experiences that are more meaningful given attachments that have accumulated over time (Carstensen et al., 1999).

Research on socioemotional selectivity theory has demonstrated that throughout life there is a fundamental shift in motivation from the social goals that are more novel and expansive of one's network towards goals that are more familiar and subsequently reduce one's network (Fredrickson & Carstensen, 1990; Charles & Carstensen, 2008). Underlying this shift is a key psychological construct regarding perceptions of time, which has come to be known as one's future time perspective. The future time perspective captures the extent to which an individual perceives themselves as having an abundance of time or a limited amount of time in their life (Grühn et al., 2016). Research has found strong support for the impact having a limited versus non-limited future time perspective has regarding how individuals are socially motivated, which has been experimentally manipulated to have differing results after controlling for age (Barber et al., 2016). Those who perceive themselves as having an abundance of time are going to be more motivated towards new social experiences that are pragmatic, exciting, and informative, where the risk of negative consequence is

not as much of a deterrent, because of the opportunity for development and growth (Lang & Carstensen, 2002). Conversely, experimental manipulations in time perspective have found that those who perceive themselves as having a limited amount of time are not going to prioritize new opportunities and risk their resources on potential negative outcomes, where instead they will be oriented towards the familiar in order to maximize their return on investment in time as a resource towards positive experiences (Fung & Carstensen, 2003; Charles & Carstensen, 2008).

One of the most enduring emotional phenomena that has come to light through studies on socioemotional selectivity and future-time perspectives is the well documented positivity effect (Isaacowitz & Blanchard-Fields, 2012; Spencer et al., 2016). The positivity effect is an emotional regulatory pattern documented among older adults, which describes the transition from experiencing balanced positive and negative affective arousal in young adulthood towards muted occurrences of negative affect with maintained, if not heightened, experiences of positive affect in older adulthood, thus capturing how older adults have emotional experiences that tend to be dominated by cognitive mechanisms enhancing positive emotion. The socioemotional selectivity framework suggests that as younger adults move from an open-future time perspective towards a more limited viewpoint in older adulthood, they become primarily motivated towards familiar social experiences as opposed to novel ones. Positive affect is maximized by mitigating the potential adverse experiences that may come with uncertain or risky social experiences that one is more likely to be motivated towards as a younger adult. Instead, older persons prioritize relationships and events that serve as primary sources of positive experience, such as those with family and loved ones, thus facilitating an overall change in cognitive affective stimulation that is lessened in negative affect (Fredrickson & Carstensen, 1990; Carstensen et al., 1999; Riediger et al., 2011; Ford et al., 2018; Kennedy et al., 2019). Beyond socioemotional conceptualisations of this developmental regulatory trend, there is research rooted in neuroscience that reflects the phenomenon of reduced negative affective experiences creating sharper contrasts of positive affective states over time, which is based on models of the aging-brain that illustrate physiological changes in mechanisms responsible for emotional processing, such as the amygdala (Caciopo et al., 2011; Smit et al., 2019).

A study conducted by Barber & colleagues (Barber et al., 2916) supports how the induction of a limited future time perspective subsequently impacts functioning in recall of positive and negative stimuli. Older adults' memory demonstrated a sharply contrasting preference towards recall of positive stimuli as opposed to negative, but this difference between age groups was mitigated with the induction of a limited future time perspective in younger adults. Indeed, as an individual′s mind orients itself towards a limited perspective on time, there seems to be a bias away from negative affective processing, which magnifies attentional experiences towards positive affect. However, there were no trait-based individual differences measured that may account for variability in positive versus negative recall.

Recent meta-analyses have accounted for contextual manifestation of a positivity effect but have not taken the time to consider predictive or moderating effects stemming from trait-based differences. Reed and colleagues (Reed et al., 2014) conducted a meta-analysis examining moderators of the positivity effect, where they found that study designs assessing the positivity effect with constrained cognitive experimental processes had smaller effect sizes to unrestrained ones, especially as the age gap in the tested samples widened, thus exhibiting contextual differences in research design, but they did not account for any individual difference moderators across the 100 studies examined. Hayes and colleagues (Hayes et al., 2020) also conducted a meta-analysis examining 102 studies, where they found how task characteristics of research design impacted the manifestation of a positivity effect, such that emotional expression recognition tasks using photographs revealed a greater positivity bias for older adults as opposed to the use of videos. Despite the importance of these meta-analytic findings that reliably support the existence of a positivity effect with age, it is almost shocking that there was no examination for who is most vulnerable to experiencing a positivity effect based on individual differences, thus illustrating the clear need to further discern factors that impact the manifestation of a positivity effect.

Using dual-frameworks of motivation for future research examining individual differences in socioemotional development and manifestation of positivity effects

There is much evidence supporting the age-related positivity effect, which suggests a reduction in arousal to negatively valenced stimuli and experiences as one progresses towards a limited future time perspective in older adulthood. Positivity is attained by focusing on meaningful emotional experiences and those experiences are enhanced by the contrast of reduced negative information processing (Carstensen et al., 1999; Barber et al., 2016). However, the theory and its effects are not without flaws. Researchers and scholars within this domain of aging and development have highlighted the lack of individual differences accounting for the positivity effect, where little is known beyond contextual characteristics of research

design about trait-based psychological factors that impact the manifestation of stronger or weaker experiences of a positivity effect (Isaacowitz & Blanchard-Fields, 2012; Luong & Charles, 2014). Theory and research examining individual differences based on dual-frameworks of motivation and emotion regulation, such as approach and avoidance orientations, provide an intuitive lens for examining different levels of experienced positivity effects across people (Gray, 1981; Higgins, 1998; Diefendorff et al., 2000; Koopman et al., 2016; Gabriel et al., 2017).

There is likely a conditional effect of approach motivation on age predicting partner selection, such that the relationship between age and selection of familiar partners will be weakened with higher approach motivation. This is based on the notion that approach-based or BAS sensitive individuals are thought to be chronically bored and under-stimulated, thus highly approach-driven older adults should be more likely to select novel, exciting social partners as a means of self-stimulation compared to older adults with lower approach motivation (Diefendorff et al., 2000). Furthermore, there is likely a conditional effect of avoidant motivation on age predicting partner selection, such that the relationship between age and selection of familiar partners will be strengthened with higher avoidance motivation. The logic behind this hypothesis is that avoidant individuals are prone to mitigate risk, where less familiar social partners may be perceived as uncertain, anxiety provoking, and risking increased likelihood for negative experiences compared to social partners with whom individuals are more familiar and to whom they are more attached (Carstensen et al., 1999; Nash et al., 2011).

Studies and experiments surrounding socioemotional selectivity theory and positivity effects have been conducted in lab settings through memory recall tasks, where participants of varying ages are asked to recall negative and positive aspects of information from photos or video footage (Fung & Carstensen, 2003; Barber et al., 2016). Accounting for approach and avoidance motivation in such studies can help answer the call-to-action accounting for individual differences in manifestation of a positivity effect. It is likely that age will have an indirect negative effect on the recall of negative information through approach motivation, such that as individuals age and are desensitized to negative stimuli that they are more motivated towards positive aspects or features, where approach motivation orients an individual to such stimuli. Conversely, age likely has an indirect positive effect on the recall of positive information through avoidance motivation, where as adults get older they become more motivated to reduce negative emotional experiences, which is in line with socioemotional selectivity theory, thus avoidance motivation becomes more activated in the presence of negative stimuli for older adults who are motivated to negate such stimuli.

CONCLUSION

Dual-frameworks of motivation are critical to accounting for individual differences among people based on variations in universal systems regulating emotion, thought, and action Although these different frameworks are unique in their own ways, such as Metcalfe and Mischel's (Metcalfe & Mischel, 1999) hot-go and cool-know framework embodying a primitive versus a sophisticated neuropsychological motivational system, while the approach-avoidance framework encompassing systems dedicated to achieving positive outcomes versus mitigating negative outcomes, the primary theme among these frameworks are systems of generativity and reduction (Elliot, 2006). Indeed, considering how people are different in the extent to which their motivational systems drive them towards both activation and attenuation, which are not necessarily always on the same continuum and may vary simultaneously, is important for scientists and practitioners alike for understanding and contextualizing antecedents and outcomes surrounding human information processing and behaviour. However, that is not to say that all of the aforementioned frameworks are equally interchangeable with one another, thus it is critical that researchers consider the theory, antecedents, and outcomes associated with each framework in terms of selecting which is most appropriate for answering the questions that their studies are asking.

A major aim of this review is to inspire future researchers in considering the utilization of such frameworks based on the psychological and behavioural effects that they account for. Individuals clearly differ in their sensitivity and ability to cope with stimuli in their environment based on their behavioural inhibition and activation systems, thus researchers studying stress and anxiety reactions may want to consider implementing such measures to greater account for variance in outcomes among people and better contextualizing their findings (Ferris et al., 2019). Research seeking to examine how people differ in their utilization of resources may want to consider approach-avoidance measures given that study results have found more avoidant individuals tend to be more conservative with their energy expenditure over time (Gabriel et al., 2017). Integrating such measures into neuroscientific and psychological research is convenient and inexpensive as they can be assessed using short-form Likert-scale questionnaires and self-report surveys even prior to experimentation.

Finally, this study offers directions for future research using such frameworks of motivation. Researchers should seek to build from the theory and ideas presented here by testing how engagement between job tasks may change depending on dual-motivational tendencies that can account for individual differences in the effect of simultaneously beneficial and costly mechanisms between tasks (Kuhl, 1994a; Baumann et al., 2005; Newton et al., 2020). Furthermore, socioemotional selectivity theory and its documented positivity effect provides a ripe area for incorporating the aforementioned regulatory systems based on the call-to-action by researchers for examination of individual differences, such that older adults with higher avoidance motivation may potentially exhibit a more pronounced positivity effect by their greater disposition towards reducing negative stimuli; the reduction in negative information processing over time is thought to be an underlying mechanism facilitating the effect, thus avoidance motivation may magnify such mechanisms (Reed et al., 2014; Luong & Charles, 2014; Byrne et al., 2016; Kennedy et al., 2019). Readers are encouraged to take the ideas presented here and build upon them in their own research for the purposes of better understanding individual motivation and regulation across disciplines.

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