

## **Age Differences in Experience and Regulation of Affect**



# Age Differences in Experience and Regulation of Affect

Pär Bjälkebring



UNIVERSITY OF GOTHENBURG  
DEPT OF PSYCHOLOGY

Doctoral Dissertation in Psychology  
Department of Psychology  
University of Gothenburg  
May 2014

© Pär Bjälkebring  
Cover layout: Pär Bjälkebring  
Design: Hermann Rorschach  
Printing: Ineko AB, Sweden, 2014  
ISBN: 978-91-628-9019-3  
ISSN: 1101-718X Avhandling/Göteborgs universitet, Psykologiska institutionen  
ISRN: GU/PSYK/AVH--297--SE  
<http://hdl.handle.net/2077/35603>

*Growing old is mandatory; growing up is optional.*  
- Charles Theodore Davis



## ABSTRACT

---

Bjälkebring, P. (2014). *Age Differences in Experience and Regulation of Affect*. Department of Psychology, University of Gothenburg, Sweden

The overall aim of the thesis is to investigate differences in how younger and older adults view and control affect. Study I and Study II investigate how participants view their happiness and what factors influence their perception of happiness. In Study I we found weak negative association between age and happiness. In addition, we found a negative association between age and both positive and negative affect. Younger adults anticipated higher levels of happiness in older age compared to their current happiness, while older adults rated their past happiness as higher than their current happiness. The results indicate that people are likely to believe that happiness changes over the lifespan. In Study II an experiment was conducted to elaborate on the finding that younger adults have a more positive view of the future compared with older adults. The analyses show that a difference in wording influenced ratings of happiness differently for older and younger adults. The results suggest that older adults prefer low arousal happiness to high, which is preferred in younger ages. In Study III we investigated the occurrence of regret, as well as regret regulation in the context of everyday life decision-making. Using a web-based diary method, daily life decisions were sampled over eight days. Younger adults reported more experienced and anticipated regret than older adults. Although regret regulation strategies were used by all age groups, older adults more often used strategies to reduce the intensity of experienced as well as anticipated regret. The results suggest that lower levels of regret in older adults, can be accounted for, at least in part, by regret prevention and other regulation strategies. In Study IV we investigated the influence of charitable giving in two experiments. We found support for an age-related positivity bias in monetary donations. This is true for the motivation to make a future donation, as well as affective thinking about a previous donation. We concluded that older adults draw more positive affect from both the planning and outcome of monetary donations and hence benefit more from engaging in monetary charity than their younger counterparts.

Together, these studies show that there are systematic differences in how younger and older adults perceive and regulate affect due to various uses of motivation and active emotion regulation strategies. Older adults seem to compensate for an age related decline in deliberate processes, which makes it possible to maintain well-being at old age.

Keywords: *age, decision making, emotion, emotion regulation*





## Swedish Summary

---

Medelåldern i västvärlden har de senaste hundra åren ökat konstant. Detta har skapat en situation där det idag lever fler personer över 65 år än tidigare, men också att andelen av befolkningen över 65 år är större än någonsin. Eftersom vi fortsätter att utvecklas hela livet så vet vi att när åldern ökar så ökar också eventuella skillnader gentemot de som är yngre. Äldre personer skiljer sig från yngre personer vad gäller hur de hanterar och upplever känslor. Det är inget konstigt att förvänta sig att någon som är 15 år gammal kommer att hantera negativa och positiva känslor annorlunda än någon som är 65 år. Samhället förutsätter att människor genomgår en emotionell mognad. Men även andra förändringar förutsätts, till exempel förväntar vi oss att en 15-åring och en 65-åring ska känna olika vad gäller en "fredagsnatt på stan", hoppa bungyjump eller att spela bingo. Vissa av dessa förväntningar bygger på stereotyper av äldre och yngre vuxna, andra är grundade i verkliga skillnader. Dessa skillnader mellan åldersgrupper består av naturliga förändringar som är kopplade till åldrande men även skillnader som har sin grund i olika levnadsmiljö, eller för olika generationer som inte direkt kan sättas i förbindelse till åldrande, så kallade kohorteffekter. Förändringar som kommer med åldrande är ett komplext samspel av naturliga neurologiska förändringar och en psykologisk och beteendemässig anpassning av beteendet efter dessa förändringar, samt psykologiska förändringar kopplade till mognad och vishet. Till exempel kan man tänka sig att äldre personer har haft mer tid att lära sig vilka tillvägagångssätt som fungerar och vilka som inte fungerar. Detta leder till att tankemässiga resonemang och problemhantering förändras när personer åldras, samtidigt som man ser olika på specifika känslor och hur dessa kan hanteras.

I de fyra studier som presenteras i denna avhandling går det inte att särskilja effekter av åldrande och kohorteffekter. För att kunna avgöra vad som är rena effekter av åldrande krävs att man följer olika kohorter över lång tid. Det bör dock nämnas att de skillnader som faktiskt existerar, oavsett om de är på grund av åldrande eller kohort, påverkar hur yngre och äldre upplever beslutssituationer. Detta blir extra problematiskt när de beslutssituationer äldre placeras i är skapade av personer som ofta är mycket yngre än de själva. Ett annat problem är att många yngre idag ställs inför val som påverkar dem mycket längre fram i livet. En medvetenhet om skillnader mellan äldre och yngre känslöhantering skulle kunna leda till beslutssituationer som är bättre anpassade de åldersgrupper de är riktade mot.

Väldigt länge behandlades beslutsfattande som om det endast rörde rationella överväganden. Idag är de flesta forskare överens om att beslutsfattande även drivs och påverkas av känslor, trots att det finns många olika teorier om hur

mycket och hur det går till när besluts formas. Vi vet att känslor kan påverka beslut på flera olika sätt. För det första kan känslor påverka själva beslutsprocessen, om du känner dig väldigt glad kan de bli så att den positiva känslan smittar av sig på det beslut du ställts inför och du blir överoptimistisk och missar att uppmärksamma risker du annars hade sett. Motsatsen är också möjlig där du på grund av dåligt humör avstår från något som egentligen är fördelaktigt. Känslor kan även vara motivation till att göra på ett speciellt sätt. Du kanske är på dåligt humör och vill må bättre och därför väljer att gå på bio med en vän, ett sätt att uppmuntra dig själv. Att förändra den negativa känslan är i det här fallet, det som motiverar dig att gå på bio. Utöver detta kan känslor även fungera som ett sätt att jämföra ”äpplen och päron”. När man ska köpa glass är det omöjligt att rent rationellt komma fram till om chokladglass eller vaniljglass är godast. I detta fall är det en bättre strategi att helt enkelt känna efter om man är mest sugen på vaniljglass eller chokladglass just för stunden, och låta den känslan vägleda beslutet om vilken glass man ska köpa. De flesta beslut är dock varken en produkt av endast rationella processer eller av endast känslomässiga processer. Dessa två processer påverkar beslut samtidigt och människor tar hänsyn till både rationella och emotionella överväganden vid ett och samma tillfälle. Dessa processer är så integrerade att det är svårt att skilja dem åt. Exempelvis har forskning visat att människor spenderar mycket tid till att på ett rationellt och metodiskt sätt planera för hur de ska göra för att senare inte uppleva ånger. Om detta planerande är primärt emotionellt eller primärt rationellt är omöjligt att avgöra. Det är dock i första hand de mer känslodrivna processerna inom beslutsfattande som denna avhandling behandlar om.

Forskning har visat att det finns skillnader i hur äldre och yngre ser på känslor men också hur de hanterar sina känslor. Denna avhandling behandlar några av dessa skillnader i fyra olika studier. Studie I och Studie II handlar om hur människor i olika åldrar ser på känslor och vad som påverkar denna syn. Studie III handlar om skillnader mellan yngre och äldre i vad gäller hur vi hanterar ånger inför ett beslut. Studie IV handlar om åldersskillnader relaterade till hur man känner när man gjort något ”snällt”, som exempelvis att ge pengar till ett barn i nöd.

Studie I handlar om hur personer i olika åldrar ser på lycka och hur lycka förändras över en människas livstid. Genom att låta ett representativt urval av den svenska befolkningen skatta sin lycka för varje tioårsperiod mellan 20 år och 80 år, kartlades hur varje åldersgrupp ser på lyckan över större delen av sitt liv. Genom att titta på hur personerna upplevde lycka i stunden blev det tydligt att lyckan var relativt stabil över hela livsloppet, yngre var inte lyckligare än äldre eller tvärt om. Vad gäller hur försökspersonerna upplevde att lyckan hade förändrats sen tidigare perioder i deras liv eller hur den skulle förändras i framtiden var skillnaderna däremot tydliga mellan yngre och äldre. Yngre personer trodde att livet bara skulle bli bättre och bättre desto

äldre de blev medan äldre personer verkade tro att livet hade varit mycket mer fyllt av lycka när de var yngre och att livet nu bara skulle bli olyckligare. Genom att titta på alla åldersgrupper individuellt blev det tydligt att alla grupper skattade sin nuvarande ålder som den med minst lycka och att de systematiskt överskattade lyckan i framtiden och bakåt i tiden. Förutom att det kan tyckas vara sorgligt att personerna i vår undersökning trodde att deras nuvarande situation var den mest olyckliga i hela deras liv finns det andra orsaker. Exempelvis att ha orealistiska förväntningar på framtiden eller det förflutna kan ha effekter på hur vi väljer att agera i nuet. Därför är en vetenskap om dessa fenomen viktig och kan hjälpa folk att fatta bättre och mer välgrundade beslut. Forskning har även visat att en negativ syn på framtiden påverkar vår hälsa negativt.

Studie II fokuserar på hur små förändringar i hur man frågar om lycka, påverkar skattningen av lycka. Ettthundranittiotre personer mellan 22 år och 93 år svarade på hur lyckliga de var för 10 år sedan, för ett år sedan, igår, nu, imorgon, om två veckor, om två månader om ett år och om 10 år. Deltagarna var uppdelade i tre grupper beroende på hur vi ställde frågan om lycka. Den första gruppen fick en inledande text ”Här får du ta ställning till lycka vid olika tidpunkter i ditt liv, både hur du har känt dig tidigare i livet och hur du tror att du kommer att känna dig i framtiden”. Den andra gruppen fick en inledande text som skulle göra att de såg lycka som en känsla med hög aktivering. ”Att vara lycklig är att kortvarigt vara exalterad och uppfylld av positiva känslor. Här får du ta ställning till lycka vid olika tidpunkter i ditt liv, både hur du har känt dig tidigare i livet och hur du tror att du kommer att känna dig i framtiden.” den tredje gruppen fick en inledande text som definierade lycka som en känsla med låg aktivering ” Att vara lycklig är att vara helt tillfreds med sitt liv, att ha ett liv fyllt med glädje. Här får du ta ställning till lycka vid olika tidpunkter i ditt liv, både hur du har känt dig tidigare i livet och hur du tror att du kommer att känna dig i framtiden.” Sedan fick alla grupperna svara på samma frågor om hur lyckliga de varit vid olika tillfällen av sitt liv, ”Med alla aspekter av ditt liv inräknade, hur lycklig är du just nu?”. Precis som i Studie 1 såg vi att yngre personer hade en mer positiv syn på sin framtid än äldre personer. Vi såg också att äldre personer blev mer påverkade av manipulationen (ändringen i den inledande texten) medan de yngre deltagarna inte blev det. Äldre personer sa att de var lyckligare när lyckan var beskriven med ord som ”tillfreds” och hade lägre nivåer av lycka när lycka beskrevs som ”exalterad”. Beroende på om manipulation såg det ut som att äldre var lyckligare än yngre (vid låg aktivering) eller som att äldre var mindre lyckliga än yngre (vid hög aktivering). Detta betyder att äldre deltagare är mer känsliga för dessa typer av förändringar i aktivering.

Studie III handlar om hur äldre och yngre upplever samt försöker motverka ånger i sitt dagliga liv. Vi lät 108 personer mellan 19 år och 89 år varje dag under en vecka svara på frågor om beslut det tagit under dagen eller planerat

att ta, samt den ånger de upplevt kopplat till detta. De skattade även i vilken utsträckning de använt strategier för att motverka ånger för de beslut de redan tagit för att förhindra att ånger uppstod för beslut de planerade att ta i framtiden. Det blev tydligt att yngre personer kände mer ånger och även förväntade sig att känna mer ånger för de beslut som skulle tas i framtiden. Vidare visade resultaten att äldre personer, trots att de både kände (för beslut de redan fattat) och anteciperade (för framtida beslut) mindre ånger använde mer strategier för att motverka ånger både i nuet och ånger i framtiden. Att äldre personer använder mer strategier för att motverka och förhindra ånger samtidigt som de upplever och anteciperar mindre ånger tyder på att äldre personer i större utsträckning än yngre använder strategier som på ett effektivt sätt kan motverka ånger i deras dagliga liv. Detta tyder på att äldre använder de strategier de vet fungerar för att motverka ånger medan yngre personer inte har den kunskapen.

Studie IV handlar om att donera pengar till välgörenhet. I två experiment undersökte vi motivationen till att ge pengar, men också de emotionella konsekvenserna av att ge pengar. Forskning har visat att prosocialt agerande, alltså att hjälpa andra i sin omgivning, leder till positiva konsekvenser, inte bara för mottagaren, utan också för givaren. Vår hypotes var att äldre fokuserar mer på det positiva av givandet jämfört med yngre. Vi lät först 353 personer mellan 20-74 år skatta hur de kände inför ett barn i nöd, vi frågade sedan hur mycket de skulle vilja donera till detta barn. Vi såg att äldre kände mer sympati och medkänsla för barnet och att deras vilja att donera berodde mer på de positiva känslorna inför barnet medan yngre deltagares vilja att donera pengar berodde på både positiva men också negativa känslor som ”Jag känner mig ledsen när jag tänker på barnet”. I vårt nästa experiment så gav vi 108 försöksdeltagare möjligheten att ge bort den belöning de fått för att delta i ett försök, till ett barn i nöd. Därefter undersökte vi hur de några dagar senare kände sig när de fick se en bild av barnet de kunde donerat pengar till. Vi såg att de som donerat pengar hade mer positiva känslor än de som inte donerat pengar. Vi såg också att äldre deltagare kände mer positiva känslor när de donerat pengar jämfört med de yngre. Slutsatsen är att äldre personer har förmågan att tillvarata positiv information samtidigt som de undviker negativ information i situationer kopplade till välgörenhet. Det innebär att äldre personer har mer att vinna än yngre personer på att ägna sig åt välgörenhet.

Sammantaget visar dessa fyra studier att äldre och yngre skiljer sig åt vad gäller att uppfatta känslor vid olika tidpunkter i sitt liv men också mer generellt att människor verkar skatta nuvarande känslor lägre än känslor de säger sig haft i tidigare perioder av livet samt känslor de tror sig få i framtiden. Vidare visar våra resultat att äldre personer och yngre personer skiljer sig i hur de uppskattar aktivering, alltså att vara nöjd eller att vara exalterad, och att små förändringar hur man ställer en fråga kan få stora konsekvenser för hur personer svarar. Vi finner även stöd för att äldre personer fokuserar mer

på positiv information och undviker negativ information. Det leder till att de kan dra mer positiva känslor ur situationer med blandande känslor. Dessutom så kan skillnader i hur människor uppfattar känslor vara en konsekvens av de strategier vi använder för att hantera och förändra de känslor som människor upplever eller anteciperar. Det verkar även finnas systematiska förändringar i vilken utsträckning äldre vuxna jämfört med yngre vuxna använder olika strategier för att reglera exempelvis ånger.

I avhandlingen dras från dessa fynd en viktig slutsats, det verkar som att det finns emotionella processer som kan kompensera för den nedgång i kognitiva processer som kommer med ålder. Trots att äldre personer har mindre kognitiva resurser verkar det som att äldre genom att använda strategier kan hålla med de resurser som finns och på så sätt behålla en hög nivå av välbefinnande.



# Acknowledgements

---

This thesis would not be possible without the more than thousand research participants participating in my studies, some of whom I had long conversations with others I have never even met I especially want to thank the participants who came all the way to the psychology department in spite of mobility constraints, and participated in hours of testing without complaint I wish you the best of luck, wherever you are.

In addition, I want to thank everyone who helped me and the contributed in the form of motivation, comments, and ideas, as well as with data collection, statistics, and proofreading. I know you know who you are, but some of you I am going to mention by name.

First, I would like to thank my two supervisors, Daniel Västfjäll and Boo Johansson for their support. Daniel thank you for your creative ideas, which gave me the excitement to keep going and Boo thank you for being calm and providing me with structure, which gave me the ability to finish. Your combined help has been the foundation of my work. I hope to have years of future collaboration and great research with both of you.

In addition to my advisors, I would like to thank Ellen Peters and Martin Tusler for showing me Ohio, giving me a place to live and a space to work. Your friendly advice has not only made this thesis better but also made

me a better person and researcher. I am very much looking forward to seeing you again.

I also want to thank the rest of my coworkers and friends at the University of Gothenburg as well as Ohio State University. I especially want to thank my fellow PhD students; Marie for making me not feel alone my first years at the department, Leif for being so smart, and Sandra for being smarter. I also want to thank the faculty, especially Niklas, Karl, Sara and Leif for being the cool kids and helping me laugh.

Furthermore, I would like to thank my friends and family for always supporting me. Even though most of the time, I think, you had no idea what I was talking about when I tried to explain what I was doing for a living. Mom, dad, and little sister, I love you so much and I hope you know that. Jaan, Tor, and Yohanna, thank you for being my best friends. I hope I have deserved you. I also want thank the Legion of Doom for taking me in and showing me the best of times.

I especially want to thank Reghan Borer for being my best friend and my partner, and for all your help and support. You are probably one of the few people that have read my entire thesis, even though you did not have too.

Finally, I would like to thank the funders of this research, VR and FAS, as well as the Universities, GU and OSU, that made it possible.



# Contents

---

<b>INTRODUCTION .....</b>	<b>1</b>
Life-Long Development.....	2
Selective Optimization with Compensation.....	4
Socioemotional Selectivity Theory.....	7
Age-related Differences in Affect .....	8
Positivity Bias .....	10
Emotional Influence on Decisions .....	12
Affective Forecasting.....	14
Counterfactual thinking .....	16
Controlling Emotions .....	19
Emotion Regulating Strategies .....	21
Age Differences in Emotion Regulation.....	24
Aim of the Thesis.....	26
<b>SUMMARY OF THE STUDIES.....</b>	<b>27</b>
Study I.....	28
Discussion of the Results from Study I.....	30
Study II.....	33
Discussion of the Results from Study II .....	35
Study III .....	37
Discussion of the Results from Study III.....	41
Study IV .....	46
Discussion of the Results from Study IV.....	49
<b>MAIN DISCUSSION .....</b>	<b>51</b>
Do We Understand Ourselves? .....	52
Growing Older is Not Only Decline .....	55
Conclusion .....	58
There are Always Alternatives.....	69
Further Directions .....	61
Limitations .....	63
<b>REFERENCES.....</b>	<b>65</b>



## Preface

---

This thesis is based on the following four studies which will be referred to by their Roman numerals:

- I. Bjälkebring, P., & Västfjäll, D. (2014). *I will be happier in the future: Investigating factors that influence the view of future and past happiness*. Manuscript submitted for publication
- II. Bjälkebring, P., Västfjäll, D., & Johansson, B. (2014). *Happiness and Arousal Avoidance: How you ask about happiness influences older and younger adults differently*. Manuscript submitted for publication
- III. Bjälkebring, P., Västfjäll, D., & Johansson, B. (2013). Regulation of experienced and anticipated regret for daily decisions in younger and older adults in a Swedish one-week diary study. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*, 26, 233-241. doi: 10.1024/1662-9647/a000102
- IV. Bjälkebring, P., Västfjäll, D., Dickert, S., & Slovic, P. (2014). *Greater emotional gain from giving in older adults: Age-related positivity bias in charitable giving*. Manuscript submitted for publication



# INTRODUCTION

---

The life-span in the western world has increased considerably during the last century (Kirkwood, 1999). This has created a situation in which never before in history have so many, nor such a big percentage of the population, been over 60 years of age. Therefore, there is a great need to consider the entire life-span in order understand differences between older and younger people, as well as research specific developmental and aging processes. Living longer has many benefits but can also create problems. For example, longer life-expectancy means a wider range of chronological age in adults, which increases age-related differences between younger adults and older adults. Additionally, a longer expected life-span means that an increasing number of younger adults needs to make decisions that will affect them far into the future. At the same time, older adults are asked to make an increasing number of decisions that previous generations never needed to make. One example of this is the change in the medical system that demands patients and future patients to be more active in making decisions about their healthcare (Finucane et al., 2002). To facilitate a positive feeling about the decision-making process, as well as the actual decision made, a better understanding is needed of the age related physical and psychological changes that may impact decision-making. It is also important to consider that people born 70

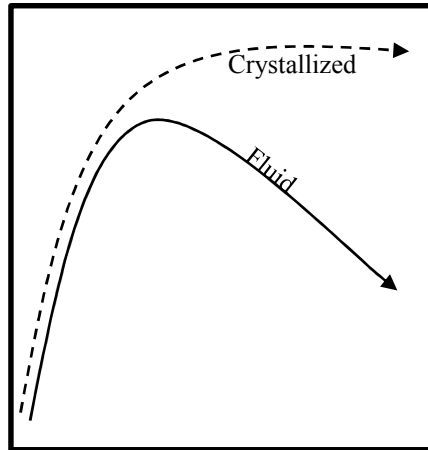
years ago will have much different experiences influencing decisions than people born today. That is, experiences of today's older generations, such as the deregulation and privatization of Swedish telecommunications, as well as the Swedish bank and real-estate crisis of 1990, may have influenced their view of how to make good decisions.

The four studies presented in this thesis investigate affective differences between people of different age groups. Identifying factors that may differentially influence the decisions of younger and older adults is an important task that will help in understanding how age differences influence decisions and how they can contribute to successful aging (Peters, Hess, Västfjäll, & Auman, 2007).

## **Life-Long Development**

One of the first developmental theories that included the whole life-span, as opposed to earlier theories such as those by Freud and Piaget (see Freud, 1964 and Piaget, 1959), which only considered development in the first decades of life, is Psychologist Erik Erikson's (1963, 1982) developmental theory based on psychoanalysis. The core concept in Erikson's theory is that all humans progress through eight psychological stages of life, each of which involves a developmental crisis. Erikson proposed that as life progresses people become increasingly aware of death, which leads to a crisis

between ego integrity and despair. Those who overcome this crisis experience ego integrity, finding coherence and meaning in their lives and accepting death. However, before reaching this final stage, humans in their middle adulthood grapple with the notion that their lives are finite. During this time, people undergo a midlife crisis between generativity and stagnation, either contributing to the next generation or ceasing to be a productive member of society. People who prevail over this crisis become generative by performing socially valuable work and mentoring members of younger generations. This shift from seeing development as something terminating at a certain age, to seeing life-long development, is the basis for the current life-span research. Research on age-related changes in cognition shows that cognitive abilities such as rapid information processing, novel problem-solving, and reasoning (“fluid intelligence”) generally decline with age (Baltes, Staudinger, & Lindenberger, 1999; Salthouse, 2012). In contrast, knowledge that is acquired through experience (“crystallized intelligence”) tends to be relatively stable or even increase with age. However, even though age-related differences in memory are the most commonly used example of age-related change, there are actually more psychological changes that occur during the life-span. I will briefly outline two theories used in this thesis to explain psychological development during the life-span.



**Life Span**

Figure 1. Development of crystalized and fluid intelligence during the life-span (adapted from Baltes, 1999)

### **Selective Optimization with Compensation**

One of the most well-known life-span theories is the “Selective Optimization with Compensation” (SOC) theory, which states that people compensate for age-related losses by focusing on remaining abilities. This theory has been used to examine decline in memory, but also for more physical functions such as decline in hearing or eyesight. SOC describes the relationship between age-related changes within individuals and changes in behavioral and cognitive styles (Baltes, 1987). Baltes suggests that throughout the life-span, our “biological potential” declines at the same time as our need for culture increases (Figure 2., from Baltes, 1987; Baltes, Staudinger, & Lindenberger, 1999). SOC suggests that as individuals progress through life, they are progressively confronted by the age-related decline in their “biologi-



cal potential”, which places restrictions on their cognitive and behavioral resources. In order to manage the restrictions placed on certain domains of one’s life, people will begin to devote mental resources to particular styles and behaviors that are able to compensate for these restrictions. This specialization will increase the ability to succeed with the styles and behaviors that resources are devoted to. However, specialization takes time, effort, and motivation, requiring people to disregard other behavior and cognitive styles. The result of this spiraling process is an age-related increase in specialized styles and behaviors in order to improve efficiency and performance, while a reduction occurs in styles seen as not beneficial. In response to this reduction, individuals will utilize specialized capacities as a compensatory mechanism as a way to manage gaps in capacities created by the specialization process (Baltes & Baltes, 1990). To give a crude example, as strength and mobility is likely to decrease with age, one can compensate by replacing the use of a heavy iron skillet to a light-weight aluminum pan, which will make it easier to move the cookware from the cabinet to the stovetop on a daily basis. However, this will also reduce the amount of resistance exercise for the muscles in the arms, leading to further loss of muscle and a decreased ability to move other heavy items in the home, which will eventually also need to be replaced with light-weight alternatives.

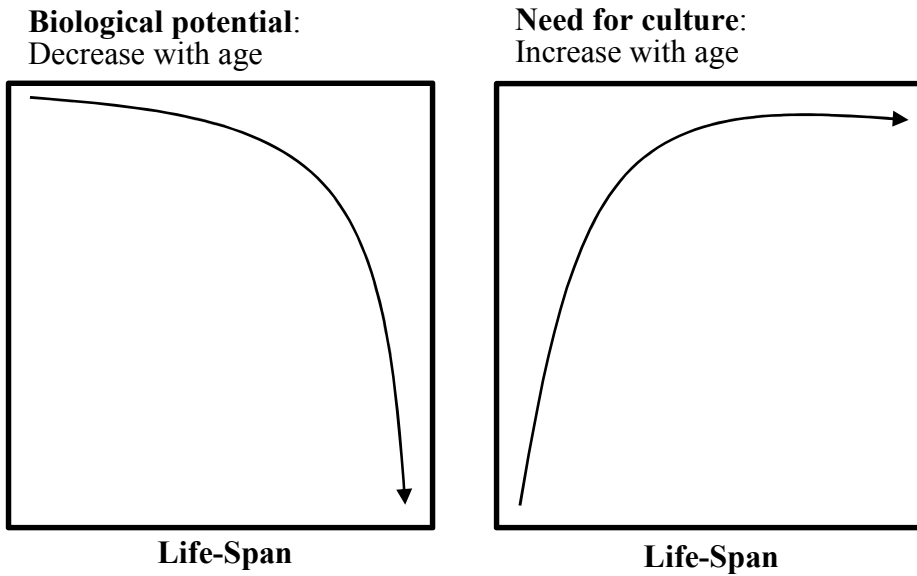


Figure 2. Schematic representation of the average dynamics between biology and culture across the life-span, proposed by Baltes (1987). By culture, Baltes meant all the psychological, social, material, and symbolic (knowledge-based) resources that humans have produced over the millennia.

## **Socioemotional Selectivity Theory**

SOC explains age-related changes in all domain of one's life, but when looking at psychology more specifically, one of the more prominent theories is the Socioemotional Selectivity Theory (STT). However, Baltes and Carstensen (1996) proposed that SST offers only a theoretical illustration of the SOC model and therefore SST should not be seen as a competitor to SOC, but rather an extension. According to SST, the temporal frames that people hold, which vary somewhat consistently with chronological age (Carstensen, Isaacowitz, & Charles, 1999), influence people's goals. This means that as we grow older, we realize that we have less time left to live and we will therefore change our goals. SST proposes that the emotion system is inherent in all goal directed behaviors, whether goals involve seeking novel information or meaning in life (Carstensen, 2006). SST focuses on two main classes of psychological goals. (1) Expansive goals, such as acquiring knowledge or making new social contacts. (2) Feeling-related goals, such as balancing emotional states or sensing that one is needed by others. Younger adults typically have an expansive time perspective and future orientation, and strive for expansive goals related to information-gathering and preparation for future challenges, while older adults typically perceive more limited time horizons, and strive for feeling-related goals that promote an emphasis on emotional meaningfulness and close personal relationships. In addition,

older adults tend to focus on the present, favor positive information, and strive for emotional equilibrium to a higher degree when compared to younger adults.

One fundamental thing to remember when talking about developmental theories, aging, and age differences, is that chronological age (i.e. years from birth) is just an indirect measure for psychological and physical changes that are likely to occur at different times in one's life. Therefore it is important to be aware of problems of causality when discussing how age influences cognition, emotion, and behaviors. There is a large heterogeneity within people of the same age, and chronological age is a proxy for other underlying processes that directly influence our cognition, emotion, and behavior.

### **Age-related Differences in Affect**

Mroczek (2001) showed that older adults tend to be in more positive and less negative mood states compared to younger adults. Costa et al. (1987) found lower levels of positive, as well as negative, affect in older adults. However, they found no significant age, birth cohort, or time effects on well-being. Other studies, using both cross-sectional designs (Baltes & Smith, 1997; Diener & Eunkook Suh, 1997), as well as longitudinal designs (Charles, Reynolds, & Gatz, 2001; Stacey & Gatz, 1991), have found that

positive affect decreases in older age. In a study by Blanchflower and Oswald, (2008) they found that well-being was U-shaped across the life-span, with higher ratings in the youngest and the oldest adults. These findings suggest that there are affective differences between younger and older adults, but do not suggest that younger adults are happier or better off emotionally than older adults, or vice versa.

When looking at how age changes the way people process emotions, research on age-related motivational shifts suggests that emotional memory among older adults is relatively intact, but that positive emotional memories are given disproportionate weight compared to negative memories (Kennedy, Mather, & Carstensen, 2004). Thus, the same event occurring some time earlier may be remembered differently by older and younger adults. Therefore, it is more likely that older adults will have “come to terms with” emotion-inducing events, meaning that older adults retained the positive aspects of an event or reinterpreted it more positively (Kryla-Lighthall & Mather, 2009). In line with these results, Kennedy et al. (2004) found that older adults showed a tendency to remember events from the same time period in the past more positively than did younger adults. This suggests that there is a connection between where in their life people perceive themselves to be and the way they process emotions. Additionally, changes in time perspective result in emotional goals becoming increasingly important as time feels scarcer. This results in greater monitoring of emotional information (Carstensen, 2006). As

a consequence, older age should be associated with an increased importance of emotional goals, and increased attention to emotional content overall, especially positive emotional content that could be used to create positive emotional experiences (Peters et al., 2007). Supporting this, Mather et al. (2004) found that older adults (compared to younger adults) had disproportionately greater activation in the amygdala in response to positive versus negative information, suggesting an age-related shift in processing styles of positive stimuli (i.e. a “positivity bias”, see also Mather & Carstensen, 2003). In addition, findings show that older adults avoid negative and prioritize positive information to a larger extent than younger adults (Magai, 2008).

### **Positivity Bias**

A possible explanation of these findings may lie in how older adults derive affective feelings from behaviors. Research suggests that older adults engage in behaviors that promote positive emotional experiences (Carstensen, 1995). The positivity bias may arise in two different ways. First, it may result from positivity enhancements (i.e., greater facilitation in cognitive processing of positive than negative or neutral information in older, compared to younger adults). Second, it may result from negativity reductions, (i.e., decreased cognitive processing of negative compared to positive or neutral material, in older relative to younger adults; Tomaszczyk & Fernandes, 2013). Positivity effects (both positivity enhancements and negativity reduc-

tions) have been shown using a variety of tasks in different areas of psychology. Here, older adults have been shown to avoid negative memories and prefer positive memories (Charles, Mather, & Carstensen, 2003; Kennedy, Mather, & Carstensen, 2004; Tomaszczyk, Fernandes, & MacLeod, 2008). It has also been shown that older adults pay more attention to positive information and pay less attention to negative information (Isaacowitz, Wadlinger, Goren, & Wilson, 2006a; Knight et al., 2007; Orgeta, 2011). Additionally, when making decisions, older adults avoid alternatives that are associated with negative affect and prefer those associated with positive affect (Kim, Healey, Goldstein, Hasher, & Wiprzycka, 2008; Löckenhoff & Carstensen, 2007; Mather & Johnson, 2000). The positivity effect among older adults is consistent with SOC Theory (Baltes & Baltes, 1990), which stresses the purposeful narrowing of one's life space and the attainment of expertise as a means of coping with age-related losses in function. It is also in line with SST, as the goals to attain positive information increase when people perceive they have less time left to live (Carstensen, Isaacowitz, & Charles, 1999).

## Emotional Influence on Decisions

As seen from the last section, there is a difference in how older adults and younger adults see and process emotions. As emotions have many consequences for one's day-to-day life, and attaining positive emotions has been argued to be the goal of life, age-related differences in emotions can have a big impact on one's everyday life. The idea that attaining positive emotions and avoiding negative emotions is the goal for most decisions is not new; in 1789 Bentham proposed that optimal decision-making is guided by the "hedonic calculus" (Bentham, 1996). In this "hedonic calculus", the pleasures and pains of each possible action are evaluated with respect to *intensity*, *duration*, *certainty*, *propinquity* (the remoteness of any pleasure or pain), *fecundity* (the chance that a pleasure is followed by further pleasures and pains followed by further pains), *purity* (the chance that pleasure is followed by pains and vice versa), and *extent* (the number of people affected). Based on the hedonic calculus, the course of action with the highest pleasure (and least pain) is chosen. Until the early-90's emotions mainly had a place in decision-making as a potential goal, and the research focus was on the rational, deliberative, and reason-based "cold" processes used when making decisions (Shafir, Simonson, & Tversky, 1993). Before this change, affect in decision-making was mainly seen as the opposite of reason, and decision-making based on "hot processes" was seen as irrational and biased (Peters, Västfjäll,



Gärling, & Slovic, 2006). Today, decision-making processes are viewed as much more dynamic, not only based on rationality but as a combination of affect and reason. This dynamic has created a new way of thinking and new theories about decision-making, such as the dual process theory presented by Kahneman and Frederick (2002). Today, researchers do not focus only on affect, nor only on rationality, but rather on “affective rationality” (Slovic, Finucane, Peters, & MacGregor, 2004). An ample amount of research has investigated how affect can influence decision-making, and we now know that it can influence these processes in many different ways. Peters (2006) divided the ways in which affect can influence judgments and decision-making into four categories (see also Peters, Lipkus, & Diefenbach, 2006). First, affect functions as a motivator. People strive to attain positive mood states, and in this way affect directs behavior toward things that we think will make us feel better (Isen, 2000). Affect also functions as a motivator in a less direct way by influencing the decision-making processes. Thinking and processing information, what we remember, and how much time we spend viewing information, are all influenced by affect (Forgas, 2001). Second, affect can function as a way of comparing different decision options that may be difficult, impossible, or meaningless to distinguish in a rational way. Affect gives us the ability to compare “apples and oranges”, so to speak (Cabanac, 1992). Third, affect can act as information in a broader sense, as asking yourself how you feel about a certain option gives you information that you use to

guide your judgment or decision process (Schwarz & Clore, 1983, 2003). This feeling can be based on prior experiences and thoughts that are relevant to the option you are thinking about (Damasio, 1994). However, it can also be based on your current mood or other, less relevant affect (Forgas & Bower, 1987; Schwarz & Clore, 1983). Finally, affect can work as a spotlight in information processing. When information is presented at the same time as affective stimuli, the affect seems to highlight the information. Then later, when recalled, the affective stimuli are forgotten but the information is remembered better and valued more (Nabi, 2003). In sum, affect can influence day-to-day decision-making by influencing the information processing and other cognitive processes, but also more directly as the goal of decision-making (i.e. I want to eat ice-cream to feel better).

### **Affective Forecasting**

In order to function as a motivator of behaviour, emotions exist in the future as goals for one's behaviours. When it comes to decision-making, emotions are not only felt in the present, they are also remembered and simulated, as well as felt for both past and future occurrences (Wilson & Gilbert, 2005). Using cognitive resources to simulate how you might feel in the future is one of the most important parts of judgement and decision-making (Gilbert, 2006). More generally, happiness has been said to be the goal of most behavior (Diener, Sandvik, & Pavot, 2009). Veenhoven (1995) defined

happiness, or life satisfaction, as the degree to which one judges the quality of one's life favorably. Happiness is perceived as important in our society and surveys have found that people think about happiness at least once each day on average (Freedman, 1978; Lyubomirsky & Ross, 1997). The most straightforward method of measuring happiness is simply to ask people "How happy are you?". Research has suggested that this method has high validity, however, more elaborated multi-item scales to measure happiness have also been proposed (see Layard, 2011). According to Lyubomirsky and Lepper (1999), one of the most widely used happiness measures is Bradburn's (1969) Affect Balance Scale, which assesses the balance of positive and negative affect experienced during the preceding four weeks. Another widely used scale to examine one's emotional well-being is the subjective well-being measured by the Satisfaction With Life Scale (SWLS), which measures people's cognitive and affective evaluations of their lives (Diener, Emmons, Larsen, & Griffin, 1985).

Prediction of future feelings is a tremendously useful ability, and one could imagine that because most people can look into the future and predict how they are going to feel, almost everyone should be happy. However, it has been shown that people are often incorrect in their predictions (Gilbert, 2006). Loewenstein and Schkade (1999) offered three explanations for why people inaccurately predict their future feelings. First, people may have "wrong" intuitive theories about hedonics. For instance, failure to predict

adaptation to negative events may stem from a person's lack of awareness of their “psychological immune system” which “protect” people from negative affect (Gilbert & Wilson, 2000). Second, people weigh events to which their attention is directed more highly than peripheral events. For instance, participants in Schkade and Kahneman's (1998) classical study may have exaggerated the impact of climate (California vs. Midwest) on well-being. Finally, Loewenstein (1996) suggested the idea of the “the hot/cold empathy gap”. When people are in a “cold” state they will have difficulty imagining or predicting how it would be to be in “hot” state and vice versa. For example, hungry people have difficulty predicting what and how much they will eat when they are not hungry. Similarly, people in a good mood incorrectly predict how it will feel to be in a bad mood.

### **Counterfactual thinking**

There are also other ways in which cognition is closely connected to emotions in decision-making. For example, whether or not the outcome was compared with alternative outcomes is a powerful determinant of emotional reactions to the outcome of a decision (Boninger, Gleicher, & Strathman, 1994; Gleicher, 1990; Gleicher et al., 1990; Kahneman & Miller, 1986). This counterfactual thinking refers to the mental simulation of comparing the present state with other possible, but unattained states (Roese, 1997). Counterfactual thoughts are common in everyday experience and may exert a sub-

stantial influence on both emotion and decision-making (McMullen, 1997). Research on outcome evaluation has shown that participants feel more strongly about an alternative if counterfactual alternatives are salient (Gleicher et al., 1990). Landman (1993) makes an additional distinction between counterfactuals that improve reality (i.e. thinking about how things could have been better), and counterfactuals that worsen reality (i.e. thinking about how things could have been worse). Regret is formed by the counterfactuals that improve reality, as regret is a negative emotion experienced when the present is compared to a better counterfactual reality (Roese, 1997; Van Dijk & Zeelenberg, 2005). Regret, like other counterfactual emotions, thus relies on mentally simulating various alternative outcomes. Such cognitive activities also require deliberative capacity, and in this sense, regret can be seen as a higher-order cognitive emotion (Russell, 2003).

Avoiding regret is a strong motivational factor for decision-making (Zeelenberg, 1999a). Regret is a decision-related emotion that arises when a chosen outcome is, or is believed to be, worse than the outcome of a non-chosen alternative (Connolly & Zeelenberg, 2002). The experience and anticipation of regret has been linked to important real-life decisions such as health behaviors (medical screening, condom use) and financial decisions (Zeelenberg, 1999b). The behavioural consequences of regret include risk aversion, risk taking, decision avoidance, and non-optimal decision-making (Anderson, 2003; Zeelenberg & Pieters, 2007). Moreover, enduring negative

emotions such as regret may have a negative impact on psychological and physical health (Fredrickson, 2001).

A recent definition by Zeelenberg and Pieters (2007) states that regret is "...an aversive, cognitive emotion that people are motivated to regulate in order to maximize outcomes in the short term and learn maximizing them in the long run". Regret, like other emotions, has several different functions (Peters, Västfjäll, et al., 2006). For example, providing crucial information about the state of our interactions with the world (Clore, 1994), or speeding up our responses in life-threatening situations (Frijda, 1987). However, we frequently experience strong emotions that need to be managed if we are to function optimally. Much research has investigated the determinants of experienced and anticipated regret among younger adults (for an overview see Zeelenberg (1999a). In contrast, very little research has thus far addressed the prevention and management of regret (here, called regret regulation) in decision-making and, especially, age differences in such regulation. There are good reasons to expect that older and younger adults may differ in their experience, anticipation, and regulation of regret given that, among other things (see Figure 3), the opportunities to overcome regret decline with age (Västfjäll, Peters, & Bjälkebring, 2010). Wrosch and Heckhausen (2002) investigated how older adults and younger adults differed in their perception of regret. In their study, participants were asked to report activities that they regretted not having pursued during their lives and to indicate the amount of

personal control they had in the situation at the time. Both the experience and regulation of regret differed between younger and older adults. When younger adults reported that they had personal control (internal control) over the regretted activity, it was associated with active attempts to change the regrettable behavior, and hence lower regret and reduced rumination. In contrast, for older adults, internal attributions were instead associated with more intense regrets. As a consequence, they actively attributed control to an external agent in a self-protective manner, thereby attenuating their regrets (Wrosch, Bauer, & Scheier, 2005). These findings suggest that regret experience and regulation may be systematically linked to aging. Not only does increasing age decrease time to undo the consequences of a decision, age-related changes also take place in both emotional and cognitive processes that are potentially relevant to the experience, anticipation and regulation of regret (Västfjäll et al., 2010).

## **Controlling Emotions**

Emotions are not only felt, we also think about them and plan to avoid or attain certain emotions. Controlling emotions is important, and being able to reduce the influence of negative emotions is essential for healthy human functioning (Davidson, Putnam, & Larson, 2000). Recent studies have correspondingly shown that attaining positive emotions speeds physiological recovery from negative emotions (Fredrickson & Levenson, 1998). Mood re-

repair is a motivational principle, suggesting that individuals in a negative mood state are motivated to change, or repair, their current mood (Larsen, 2000). In their 2001 study, Neumann, Seibt, and Strack showed that people used positive stimuli to reduce negative affect. When the participants in their study were made aware that their bad mood depended on a previous induction (listening to sad music), they used a positive stimuli (a comic strip) to repair their bad mood. Another example of mood regulation is that sad people tend to be more helpful than others, but if they are made to believe that their current emotion is impossible to change, they cease to be helpful (Manucia, Baumann, & Cialdini, 1984). Similarly, Josephson (1996) showed, in an experiment, that participants used positive memories to repair their induced sad mood. However, this effect was only shown in participants that scored low on a depression measure, as participants with higher depression scores failed to repair their sad mood. This suggests that depression and emotion regulation are connected. Baumeister, Vohs, DeWall, and Zhang (2007) suggested that most mood repair is driven by the pursuit to feel better. Further, they note that it is the anticipated (positive) emotion related to affect regulation, rather than the current (negative) emotion (which is the reason for affect regulation) that influences behavior.



## **Emotion Regulating Strategies**

For the most part, people can control virtually every aspect of emotional processing using different processes and strategies (Gross, 2003). These processes and strategies whereby people manage their own emotions are commonly referred to as emotion regulation (Koole, 2009). When looking at decision-making, regret regulation is one of the most important parts of emotion regulation (Zeelenberg, 1999b). Regret regulation does, in many ways, shape how we choose between different alternatives, but it also influences our behavior after the decision is made (Zeelenberg, 1999a). There is also evidence that suggests that there are systematic differences in how younger and older adults regulate regret (Wrosch et al., 2005; Västfjäll et al., 2010). Among younger adults, the consequences of experienced regret and the possibility of future regrets are managed by a number of systematic strategies. Zeelenberg and Pieters (2007) summarized these strategies into three categories: decision-focused, alternative-focused and feeling-focused prevention and management strategies (Table 1).

---

**I. Prevent future regret**

1. *Decision-focused prevention strategies*
  - a. Increase decision quality
  - b. Increase decision justifiability
  - c. Transfer decision responsibility
  - d. Delay or avoid decision
2. *Alternative-focused prevention strategies*
  - a. Ensure decision reversibility
  - b. Avoid feedback about forgone alternatives
3. *Feeling-focused prevention strategies*
  - a. Anticipate regret

**II. Manage current regret**

1. *Decision-focused management strategies*
    - a. Undo decision
    - b. Justify decision
    - c. Deny responsibility for the decision
  2. *Alternative-focused management strategies*
    - a. Reverse decision (switch to alternative)
    - b. Re-appraise quality of alternative
  3. *Feeling-focused management strategies*
    - a. Psychological repair work
    - b. Suppress or deny regret
- 

Table 1. Strategies for regulating regret among younger adults (from Zeelenberg & Pieters, 2007)

Examples of strategies to prevent future regret involve avoiding feedback about non-chosen outcomes, deliberately anticipating regret, and delaying the decision. Strategies to mitigate experienced regret include justification, reversal of the decision and emotion regulation or suppression. Zeelenberg and Pieters (2007) noted that these strategies are used and imple-

mented (among younger adults) based on “their accessibility and their instrumentality to the current overarching goal”.

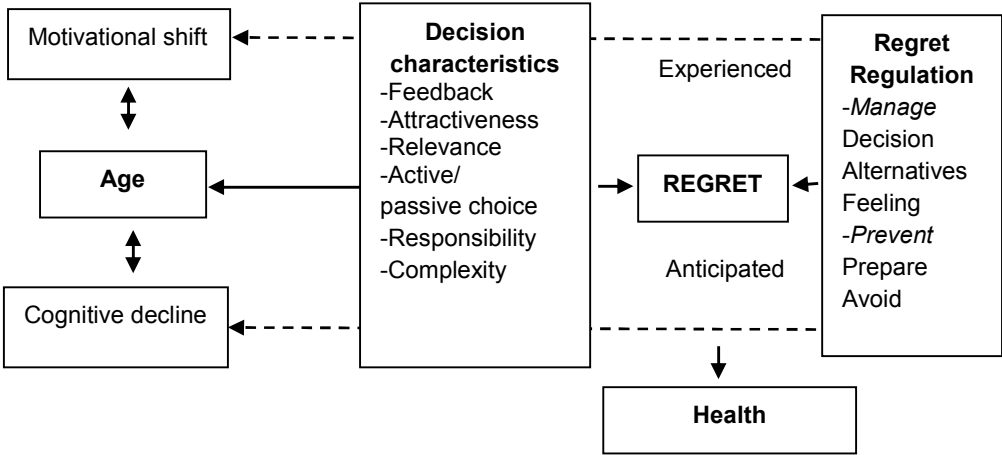


Figure 3. Framework from (Västfjäll et al., 2010)

While it is believed that regret is a frequently experienced emotion in everyday life, no studies to my knowledge have adequately sampled everyday regret experiences in an experience-sampling method. Studies of decision experiences among younger adults have been performed, but these have not measured regret (Hogarth, Portell, & Cuxart, 2007; Hogarth, Portell, Cuxart, & Kolev, 2011). Similarly, studies of emotional experiences with older adults exist, but they have not measured regret or examined decisions (Carstensen, Pasupathi, Mayr, & Nesselrode, 2000). Studies of everyday regret exist, however they ask participants to think about something they do regret and therefore do not answer the question of frequency. Summerville (2011) investigated natural regrets in a longitudinal study and showed that regret de-

creased proportionally over time, but less so if it concerned attainable ongoing goals. A missing link in the literature is whether these strategies can be applicable and work outside of a laboratory or experimental setting. As an exception, Stoeber and Janssen (2011) showed that positive reframing (reappraisal), as well as acceptance and humor, were successful strategies to cope with daily failures in a real-life setting.

### **Age Differences in Emotion Regulation**

Several lines of research suggest age-related declines in the controlled processes of the deliberative system, such as decreased speed of processing (Salthouse, 1996), and deficits in explicit memory and learning (Cohen, 1996). These changes are evident at a neural system level, where the prefrontal cortex (related to working memory and executive functions such as the control and regulation of cognition) deteriorates with normal aging (MacPherson, Phillips, & Della Sala, 2002). Since regret is a cognitive emotion which relies on comparison (Zeelenberg & Pieters, 2007) that involves orbitofrontal and prefrontal activation of the cortex (Camille et al., 2004; Coricelli et al., 2005), this line of research suggests that the experience of regret should decline with age and co-vary with age-related declines in deliberative capabilities. This is also consistent with research by Hess (2000, 2006), who has hypothesized that aging is associated with increased selectivity in task engagement because of actual or perceived declines in

cognitive resources. Anticipation of regret has not, so far, been extensively studied across the adult life-span. However, given that anticipation is defined as “primarily cognitive expectations about future emotions, without actually experiencing them in the present“ (Loewenstein, Weber, Hsee, & Welch, 2001), it may be expected that cognitive decline would lead to decreased anticipation of regret. Similarly, emotion regulation is cognitively and physically demanding (Gross, 2008), so a purely cognitive perspective on emotion regulation suggests that it should be less often employed and be less successful among older adults. However, recent research has shown that emotion regulation in fact increases with age, and that older adults are often very skilled in regulating emotion (Charles & Carstensen, 2007; Gross, 2008; Magai, 2008). This suggests that older adults know what strategies are functioning and focus their cognitive resources on the strategies that they know work, which is in line with the expectations of SOC.

## **Aim of the Thesis**

The present research examines whether or not older adults (compared to younger adults) differ in their experience of affect and regulation of affect. In line with motivational life-span theories, I expected that older adults would experience more positive affect, as they value goals related to attaining positive affect to a higher extent than younger adults (Kennedy, Mather, & Carstensen, 2004; Mather & Carstensen, 2005; Tomaszczyk, Fernandes, & MacLeod, 2008). Further, in line with the positivity bias, I expected that older adults would be motivated more by positive information than negative information, when compared to younger adults (Isaacowitz, Wadlinger, Goren, & Wilson, 2006; Orgeta, 2011). Finally, I expected that older adults would be more efficient in their regulation of affect, as they have more experience with emotion regulating strategies (Charles & Carstensen, 2007; Gross, 2008; Magai, 2008).

# SUMMARY OF THE STUDIES

---

The four studies in this thesis investigate age-related differences in affect and regulation of affect. However, they use different sampling methods, as well as different ways to examine different forms of affect. Study I uses a survey sent to a national representative sample, which makes it possible to generalize to a bigger part of the population. Study II has an experimental design directed toward investigating the difference in influence of three randomly assigned manipulations. Study III is a repeated measure (one week) web-based diary survey, in which participants' daily activities are reported, making it possible to understand the relationship between regulation of regret to decision-making in daily life. Study IV consists of two experiments, the first aim to investigate the motivations to charitable giving, the second aim to investigate the outcomes of charitable giving. Together they provide a more complex view of age-related differences in how people view affect, regulate negative affect, and attain positive affect.

## Study I

**Aim.** The aim of Study I was to investigate differences in how people view their current, future, and remembered happiness and how age and other individual differences are linked to ratings of current, future and past happiness.

**Method.** Questionnaires were mailed to 2,197 respondents drawn from a random sample (67 did not reach the recipient). The questionnaire contained a cover letter explaining the purpose of the study, as well as a postage-paid, pre-addressed envelope for returning the completed questionnaire. A thank you letter and reminder were sent to all participants after one week. Another reminder was sent to participants who had not yet responded after two weeks. A total of 825 questionnaires were returned by mail directly to the authors, for a response rate of 39%. The questionnaire contained questions about chronological age, current, future, and past happiness, divided into seven different decenniums between 20-80 years. The questions about happiness were asked on a five-point scale (1="Not happy at all" to 5 = "Very Happy"). The questionnaire contained three scales measuring individual differences. (1) Future Time Perspective (FTP): A measure describing how people conceptualize their future and how far away they feel to their death, as opposed to chronological age, which measures distance from birth (Carstensen & Lang, 1996). (2) Positive Affect Negative Affect Schedule



(PANAS): A measure of to what extent the participants had felt 10 positive affects (PA) and 10 negative affects (NA) throughout the preceding 4 weeks (Watson, Clark, & Tellegen, 1988). (3) The Satisfaction with Life Scale (SWLS): A short 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life (Diener et al., 1985).

**Results.** Ratings of current happiness were slightly lower for older participants than for younger participants. In addition, ratings of affect were lower for older adults than for younger adults. When looking at PA and NA separately, NA decreased more than PA at higher age. These findings indicate that older participants feel less affect overall than younger participants. Ratings on the FTP scale showed that older participants scored lower than younger participants, indicating that older participants feel like they have less opportunity to change their future, and a feeling of being closer to their death. In contrast to the other measures, SWLS had a positive correlation with age, indicating a higher level of subjective well-being in older participants. When comparing current happiness to future and past happiness, it became apparent that current happiness was rated lower. We could also conclude that older participants rated their younger years as the happiest, while younger participants anticipated the highest level of happiness in old age. Distant episodes were overall rated as happier both in anticipation and memories of happiness. We also concluded that the current level of NA influenced both future and

past happiness, while PA only affected memories of happiness, and FTP affected anticipated happiness.

### **Discussion of the Results from Study I**

The focus of this study was to investigate how a random sample from the Swedish population perceived their happiness throughout their adult lifespan. We also aimed to capture some of the factors that would influence the participant's view of past and future happiness. To investigate this we examined the natural variation of the explaining variables within different age groups. We found that older participants had lower levels of positive affect and of negative affect, measured by the PANAS. Cacioppo, Berntson, Bechara, Tranel, and Hawkley (2011) suggest that age related changes in the brain lead to a reduced level of activation in the amygdala, which is responsible for controlling how we process emotions. This fits our observation of lower levels of both positive and negative affect in older adults. Longitudinal studies have also found that age is negatively correlated to positive affect and negative affect (Charles et al., 2001). The affective items included in the PANAS (e.g. active and afraid) are high in arousal, so our finding of lower levels of both positive and negative affect measured by the PANAS in older adults may be a product of avoiding emotions with high arousal (Pinquart, 2001). The level of happiness was slightly lower in older adults, however the level of SWLS did not differ between older and younger

adults. According to socioemotional selectivity theory (SST), the temporal frames that people hold change with age, which corresponds to our finding that older adults had lower levels of FTP (Carstensen, Isaacowitz, & Charles, 1999). In light of these findings, we cannot determine whether older or younger participants in our study are emotionally “better off” than the other. We can only conclude that there seem to be affective differences between older and younger adults. As previous studies suggest, the affective differences in our study are centered at high arousal emotions such as the PANAS. The age related difference in happiness seen in our study may be associated with the arousal level, as happiness can be seen as both high and low in arousal.

On average, participants in this study had a positive view of past and future happiness. This indicates that people do not think that their happiness will be constant or has been constant, but rather see happiness as changing over their lifespan. Further, we find support that a person’s age, level of NA, SWLS, and PA are associated with the person’s current happiness. In addition, age, NA, and FTP are associated with predictions of future happiness, while age, NA, and PA are associated with memories of past happiness. The participants with the lowest level of current happiness predicted that their happiness would increase faster, and reported that their past was relatively happier than those with higher levels of happiness.

The findings in Study I show that people seem to think things will get better (or have been better) than their current emotional state. Younger participants had a positive view of happiness in older age and older participants had a positive view of happiness in younger age. In addition, participants who had a lower level of current happiness believed that their far future would improve more than those that were already happy. These findings suggest that ratings more distant in time are more abstract (Trope & Liberman, 2003), and hence more susceptible to motivational thinking (Hsee, 1995). Therefore, emotion regulation processes motivate ratings of distant future and distant past happiness.

## Study II

**Aim.** The aim of Study II was to investigate whether or not arousal level influences ratings of one's happiness at nine different time points, and if the influence of the arousal manipulation interacts with age (i.e. if older adults are influenced more by the manipulation).

**Method.** A total of 193 participants (77% of the contacted sample) participated in this study. Ages ranged from 22 to 92 years (mean age 56 years), with 37% men. The relatively high mean age is an effect of a higher response rate in older participants compared to younger participants.

As a part of a larger survey about well-being, we included ratings of happiness at different time periods. Participants were asked "All things considered, how happy are you right now?" In addition, we asked how happy they had been 10 years ago, 1 year ago, and yesterday, as well as how happy they thought they would be tomorrow, in two weeks, in two months, in one year, and in ten years. Happiness was rated on a five-point scale (1 = not at all happy, 5 = very happy).

Critical to our experiment, we randomly assigned participants to one of three arousal manipulations that participants read before performing the happiness ratings. (1) Control manipulation, "rate your happiness". (2) Low arousal manipulation: "happiness is to be satisfied, to have a life filled with

positive emotions”. (3) High arousal manipulation: “happiness is to be ecstatic, to be bursting with positive emotions”.

**Results.** Our primary analysis concerns the hypothesis that the arousal manipulation would influence the rating of happiness. Secondly, if the manipulation was successful, does it interact with age? We employed a Multi Level Model (MLM) in R-statistics 3.0.2 using the LmerTest package for our analyses (data and R syntaxes used are available). The dependent variable is the happiness rated for a specific time, as all participants rated their happiness at nine time points (the nine time points representing happiness ten years ago, one year ago, yesterday, now, tomorrow, in two weeks, in two months, in one year, or in ten years), and a repeated measures method is used. The time variable is included as a predictor and the participants have random slopes and intercepts on this variable. In addition, age (*z*-scored) and the arousal manipulation conditions (control = 0, low -1, and high 1) are included in the model as fixed predictors. This means that the model is centered at a participant of mean age, rating happiness ten years ago, receiving the control condition.

The model showed that the arousal manipulation influenced the ratings of happiness significantly ( $B=-.22$ ,  $p=.002$ ), meaning that overall the high arousal manipulation had lower ratings of happiness. In addition, age interacted with the arousal manipulation ( $B=-.15$ ,  $p=.013$ ), so that older adults

were more influenced by the manipulation. The overall view of happiness was that happiness would increase from ten years ago to ten years in the future ( $B=.03$ ,  $p=.001$ ). However, the interaction between time and age showed that younger adults had a more positive view of future happiness when compared to older adults ( $B=-.09$ ,  $p<.001$ ).

## **Discussion of the Results from Study II**

We showed that older adults rate happiness higher when primed as a low arousal emotion, and rate happiness lower when primed as a high arousal emotion, while younger adults remained uninfluenced by the happiness manipulation. These results have several important implications:

First, our results are consistent with the literature suggesting that older adults avoid high arousal emotions, regardless of valence (Pinquart, 2001). Previous research on the positivity bias has sometimes compared negatively-valenced emotions (relatively higher in arousal) with positively-valenced emotions (relatively lower in arousal; Mather & Carstensen, 2003). While plenty of research supports an age-related positivity bias for positively-valenced emotions (Carstensen & Mikels, 2005; Kennedy, Mather, & Carstensen, 2004; Tomaszczyk, Fernandes, & MacLeod, 2008), our results suggest that arousal avoidance may be a part of the positivity bias. Research has suggested that affective and emotional processing differences are related to cognitive functioning (Mather & Carstensen, 2005; Mather & Knight,

2005), and that distraction of cognitive abilities can reverse the positivity bias in older adults (Knight et al., 2007). This suggests that the preference for positive information and avoidance of negative information in older adults is an active process that may require cognitive resources. Further analysis is needed to explain why older adults avoid high arousal happiness.

Second, the fact that subtle manipulations of how happiness was described (low or high arousal) systematically changed happiness ratings of past, current, and future happiness is important for both research and applications. Our relatively small arousal priming created age differences in happiness ratings, which could be interpreted as older adults are happier (compared to younger adults) in the low arousal manipulation, as well as that older adults are less happy (compared to younger adults) in the high arousal manipulation. Today, measures of well-being and happiness are used as indicators of the health of nations (Diener, 2010). Our results show that the wording of these instruments can dramatically influence responses. Further, these results are important to research on age-related differences in emotions that rely on self-reported emotions (Scheibe & Carstensen, 2010). This experiment shows that a small change in priming may create or accentuate differences between older and younger adults. It also shows that both valence and arousal are determinants of preference for affect (Russell, 2003), and that older adults systematically prefer low arousal happiness and avoid high arousal happiness.



## Study III

**Aim.** The aim of study III was to investigate differences in how younger and older adults regulate their current regret in a real life setting.

**Method.** To sample daily decisions, a one week web-based survey was administered through email. In total, participants of this study were asked to complete ten web-based surveys: one background survey, eight daily surveys, and one follow-up survey. The eight daily surveys were identical and participants rated current mood, regret, regret regulation strategies toward one decision made during the day, as well as anticipated regret and regret prevention strategies toward one decision not yet made. Participants were also asked to categorize the decision, as well as describe it in a short sentence. The background test asked about age, income, and gender, as well as PANAS. From the Gothenburg University (Sweden) participant pool, we identified 200 individuals who each received an e-mail inviting them to participate in this study. The final sample consisted of 108 participants, ranging from 19 to 89 years, with a mean age of 47 years (33% male 64% female, and 3 % unknown). On the first day of the study, participants received an e-mail with a link to the background survey. In the eight following days, they received one e-mail per day with a link to a web survey focusing on that particular day. In the daily surveys, participants rated positive mood and negative mood, and were then asked to report one decision made that day and to

categorize the decision by selecting one domain (Economy, Work, Family, Leisure, Consumption, Other), as well as describe the decision with one short sentence. Then they reported to what extent they used seven regret regulatory strategies, selected from Zeelenberg and Pieters' (2007), when making this specific decision. (1) "I avoid additional information about the decision." By minimizing the chance to get information that triggers regret (i.e. to see that the TV you bought went on sale the following week), regret can be avoided. (2) "I try to redo the decision." Restarting the decision process from the beginning and trying to find another outcome that is perceived as better and therefore elicits less regret. (3) "I try to motivate that the decision was right." Finding reasons that the decision was right can mitigate experienced regret. (4) "The outcome is not my fault." Trying to blame an external factor or other blame could lessen regret. (5) "I will try to change to another alternative." Realizing that one of the other alternatives was better than the one that was chosen leads to regret. Changing to the alternative that is perceived as better can, in these cases, lessen regret. (6) "I try to reevaluate decision." Seeing a regretted decision in a new light can help lessen regret. This strategy is one of the most researched regret regulation strategies. (7) "I try not to think about it." Not thinking about the decision is called suppression. This can prevent rumination and negative feelings that are activated when thinking about the decision.

Thereafter participants rated to what extent they regretted the decision. In the third part, participants listed a future decision they had thought about during the preceding 24 hours, but had not yet made, and categorized it in one domain (Economy, Work, Family, Leisure, Consumption, Other). They were asked to what extent they used six regret prevention strategies towards this specific future decision, selected from Zeelenberg & Pieters, (2007). (1) "I try to get additional information." Getting more information before the decision is made makes it more likely that you have information you can use to make a better decision and therefore be less likely to regret the decision. (2) "I try to be totally sure about the decision." Being totally sure about the decision means that you feel ready to make the decision. (3) "I try to get support from someone else." Asking someone else for advice gives social support and information that can improve the decision. (4) "I will try to delay the decision." Delaying the decision gives additional time to get more information and time to think things through. (5) "I will try to make sure I can change to another alternative." Having a backup plan, in the event that the chosen alternative turns out to be not as good as expected, can help with negative feelings. (6) "I expect to feel regret." Expecting or preparing to feel regret can help in dealing with negative feelings before making a decision. Saying "I know I'm going to regret this, but ok only this time" is a way of acknowledging and lessening the negative part of a decision.

Finally, participants evaluated to what extent they anticipated to regret the decision. All variables were rated on a five-point scale (from 1="not at all" to 5="regret very much").

**Results.** Younger participants experienced regret more often than the older adults, when dividing participants by age. Looking at group level, younger participants reported experiencing regret of some intensity in 45% of the decisions that they made, while older participants only reported experiencing regret in 20% of the decisions that they made. These figures suggest that older adults feel daily regret less often than younger adults. Further, looking at anticipated regret for the daily decisions that our participants thought about, but had not yet made, the level of anticipated regret was higher than the actual experienced regret (Gilbert, 2006). When examining the age groups separately, younger participants reported that they anticipated experiencing regret of some intensity in roughly 90% of future decisions, while older adults anticipated feeling regret in 60% of their future decisions. These findings suggest that older adults experience and anticipate regret less often than younger adults.

We found that four of our regret regulation strategies, "Chance to change decision", "Change to another alternative", "I try not to think about it", and "I try to reevaluate the decision", reduced experienced regret. One of these strategies, "I try to reevaluate the decision", was used significantly more often by older adults. A mediation analysis showed that reevaluation

was a significant mediator on the influence of age on experienced regret. When looking at anticipated regret, the three strategies that reduced anticipated regret were “I will be totally sure on the decision”, “I will try to delay the decision” and “I expect to feel regret”. Two of these strategies, “I will try to delay the decision” and “I expect to feel regret”, were used more often by older adults. Mediation analyses showed that delaying the decision and expecting to feel regret were significant mediators on the influence of age on anticipated regret.

### **Discussion of the Results from Study III**

Four of seven strategies were found to reduce experienced regret, and two of these, “I try to get a chance to change decision” and “I try to change to another alternative”, are focused on changing or redoing the decision. It is not surprising that a good way of reducing regret is to redo or change the decision that caused the regret. Reversibility of the decision as a working strategy is consistent with regret intensity theory (Beike, Markman, & Karadogan, 2009), and recent findings on the opportunity to undo or redo the consequences of a choice (Summerville, 2011). However, research has also shown that reversibility of a decision makes the chosen alternative less enjoyable (Gilbert & Ebert, 2002).

The third strategy “I try not to think about it” is focused on avoiding thinking about the cause of the negative emotion (suppression). However,

suppression is often a maladaptive strategy because it does not “solve the problem” causing regret (Gross, 2003; Gross & John, 2003). In addition to suppression, reappraisal (“I try to reevaluate the decision”) was also related to less regret. Reappraisal was used significantly more by older adults in our study, and was a significant mediator of the influence of age on regret. This strategy has been shown to be an efficient strategy in regulating regret (Goldin, McRae, Ramel, & Gross, 2008). This suggests both that regret regulation strategies reduce experienced regret, and that older adults use specific working regret regulation strategies to a higher extent than younger adults.

Anticipated emotions are important factors in the decision-making process (Gilbert, Gill, & Wilson, 2002; Mellers & McGraw, 2001), and research has suggested that anticipated regret influences the decision-making process (Zeelenberg, 1999a). We found that three of six regret prevention strategies were effective in reducing anticipated regret. First, “I expect to feel regret”. Expecting a bad outcome with the intention of not becoming disappointed is a strategy that many people believe can reduce future regret. However, research has shown that it does not work as well as we hope (Golub, Gilbert, & Wilson, 2009). This strategy was used significantly more often by older adults than younger adults, and was shown to be a mediator of the influence of age on regret. Second, “I try to be totally sure about the decision”. Corresponding with this, uncertainty has been shown to influence mood adversely and intensify the negative impact of aversive stimuli (Grupe &

Nitschke, 2011). Critchley, Mathias, and Dolan (2001) also found that uncertainty is associated with arousal at a neurophysiological level. Finally, “I try to delay the decision” was also a successful strategy to reduce anticipated regret. Delaying the decision gives the decision-maker more time, meaning more opportunity to get information and think about the decision. However, this study only measured the effect of delaying the decision on anticipated regret, and its effect on experienced regret after the decision was not investigated. Delaying the decision prolongs the period of anticipating a negative outcome, and research has shown that those who often delay decisions for longer periods of time have higher levels of negative affect (Anderson, 2003). Delaying the decision was also one of the strategies used more often by older adults, and was a significant mediator on the influence of age on anticipated regret.

In addition to the regret prevention strategies that reduced regret in our model, older adults used two strategies that did not reduce anticipated regret. “I will get support from someone else” was used more often by older adults, corresponding with the SST, which claims that older adults value social bonds more than younger adults (Carstensen, 1995). Older adults also used “I will make sure I can change to another alternative” more often than younger adults did. This strategy did not reduce anticipated regret. However, redoing the decision was one of the strategies that reduced experienced regret.

In sum, older participants used more regret regulation strategies, even though they anticipated and experienced less regret than younger adults did. Mediation analyses showed that regret regulation and regret prevention strategies mediated the influence of age on experienced and anticipated regret. This suggests that the lower level of regret in older adults is a consequence of a more frequent or more effective use of regret regulation strategies (Shiota & Levenson, 2009). However, these strategies cannot fully account for the age differences in regret. In addition to using regret regulation strategies, there are several other explanations that could explain why older adults anticipate less regret. One explanation is a simple projection of current feelings into the future. If older adults experience less regret, they would likely forecast experiencing less regret as well. Another possibility is that older adults can draw on their experience (i.e. “wisdom”) to a larger extent and therefore make more realistic predictions about future regret. In support of this interpretation, Nielsen, Knutson, and Carstensen (2008) found that older adults were more correct in their affective forecasts than younger adults. A third possibility is related to the belief that normal aging is associated with a decline in fluid intelligence, which is an important factor in affective forecasting. Older adults may form less clear mental representations of future emotions and therefore be more correct in their affective forecasting, due to the inability to create intense emotional mental imagery of the future (Hoerger, Quirk, Lucas, & Carr, 2010). More research is needed to answer these ques-



tions. However, this study suggests that the lower level of regret in older adults compared to younger adults is in part explained by the use of regret regulation strategies.

## Study IV

**Aim.** The aim of Study IV was to investigate age-related positivity bias in charitable giving in two experiments. In Experiment 1 we examined motivational factors in monetary donations, while Experiment 2 focused on the emotional effect of actual monetary donations.

**Method.** In Experiment 1, participants ( $n=353$ , age range 20-74 years) were asked to rate their affect toward a person in need and then state how much money they would be willing to donate to help this person. Participants were instructed, “This child is in need of aid. The child is facing starvation and is in immediate need of food. Suppose you are now given the opportunity to donate money to a trusted aid organization to help this child. We will ask you to think about ‘warm glow’, a positive feeling that you may experience when you do something good for someone.” They were then asked to rate their feelings toward this child and also to rate whether or not they wanted to give money to this child. In Experiment 2, participants ( $n=108$ , age range 19-89) were asked to rate their affect towards a donation made a few days prior. After completing a study at the university, participants were told that they could get 90 SEK (Swedish Kronor; equivalent to \$15) as compensation. They were also told that if they preferred, they could give away a part or all of this money to a charity. We presented them with a picture of a child in need and told participants “This child is in need of aid. The child is facing

starvation and is in immediate need of food.” The participants then decided if they wanted donated a part or all of their compensation to charity and ended their participation in this part of the study. A few days later, the participants were sent a letter asking them about their donation. We again presented them with the picture of the child and stated the sum donated to the child, and then asked about how they felt when thinking about their decision to donate or not.

**Results.** In Experiment 1, we found that older adults felt more sympathy and compassion toward the child presented, and were less motivated by negative affect when compared to younger adults, who were motivated by both negative and positive affect. In two separate regression analyses, we investigated whether the motivational influence of positive emotions, as well as negative emotions, differed between younger and older adults. This can be seen in the non-significant interaction ( $B = -.026, p < .73$ ) between age and positive emotion. Positive emotions were an equally good predictor for donation in younger and older adults ( $R^2 = .31, F(3,348) = 53.0, p < .01$ ). However, the interaction between age and negative emotions ( $B = -.13, p = .04$ ) showed that negative emotions had a different influence on older and younger adults donations ( $R^2 = .28, F(3,348) = 45.6, p < .01$ ). Negative emotions were a good predictor for younger adults, as higher levels of negative emotions corresponded to higher amounts of giving, and lower levels of negative emotion correspond to lower amounts of giving. While, for older adults, higher levels

of negative emotion did not predict higher amounts donated, and lower levels of negative emotion did not predict lower amounts donated to the same extent.

In Experiment 2, we found that the level of positive emotional reaction from monetary donations was higher in older participants compared to younger participants. To investigate the feelings elicited when donating money to charity, we asked participants to think about their choice of donating, and to rate the feelings (happy, sad, and “warm glow”) elicited while doing so on a five-point scale (1=“not at all” to 5=“very much”). The analysis showed, in line with positivity bias, that older participants, whether they donated money or not, felt more happy ( $r(70) = .21, p = .04$ , one tailed) and more “warm glow” ( $r(70) = .263, p = .01$ , one tailed) when thinking about their choice, however, age had no impact on sadness ( $r(70) = -.14, p = .12$ , one tailed). We wanted to investigate if older adults differed from younger adults in the emotions elicited from donating money to charity. We expected that older adults who donated money would benefit more from this donation than younger adults, due to the positivity bias. To investigate this we divided the participants into two groups: participants that donated less than half of their reward and participants that donated more than half of their reward. In a regression analysis we investigated whether or not age and donating money interacted with happiness, sadness and “warm glow”. Our first regression analysis ( $R^2 = .12, F(3,68) = 3.19, p = .03$ ) revealed a significant interaction,

suggesting that older adults who donated felt happier ( $B = .75, SE = .34, p = .01$ , one tailed). Our second regression analysis ( $R^2 = .14, F(3,68) = 3.59, p = .02$ ) also revealed a significant interaction, suggesting that older adults who donated felt more “warm glow” ( $B = .61, SE = .37, p = .05$ , one tailed). This demonstrated that older adults had a stronger positive reaction to donating money to charity compared to younger adults.

### **Discussion of Results from Study IV**

The two experiments in Study IV show that older adults (compared to younger adults) derive more positive affect from charitable giving, and that the positive affective consequences of charitable giving are the main determinant of charitable giving. More broadly, these findings are consistent with research showing lower levels of negative affect, and higher levels of positive affect, in older adults (Carstensen, 2000). The results of this study suggest that some of the emotional differences between older and younger adults can be attributed to the emotional benefits derived from various everyday behaviors, such as acting prosocially. An important finding in the study was that monetary donations in older adults were less motivated by negative emotions when compared to younger adults.

Previous research demonstrating a relationship between monetary donations and overall happiness has shown that ‘doing good’ is associated with ‘feeling good’ (Dunn et al., 2008). It is therefore likely that the differ-

ences in emotional responses to prosocial behavior, similar to what has been shown in the present research, have implications for overall well-being. Doing good, and frequent volunteering in particular, has also been shown to have direct effects on health (Kim & Ferraro, 2013).

To conclude, helping others is typically associated with both negative and positive emotions. However, Study IV suggests that age-related changes in emotional processing may protect one from the negative consequences, and increase the positive consequences, of helping others. Older adults showed both increased willingness to give, as well as increased benefit from giving. Consequently, older adults would benefit from encouragement to help others and opportunities to do so to, which would increase well-being in the second half of the life-span.

# MAIN DISCUSSION

---

This thesis investigated whether or not older adults (compared to younger adults) differ in their experience of affect. In line with motivational lifespan theories, which suggest that older adults value goals related to attaining positive affect to a higher extent than younger adults, I found that older adults experienced more positive affect (Kennedy, Mather, & Carstensen, 2004; Mather & Carstensen, 2005; Tomaszczyk, Fernandes, & MacLeod, 2008). Further, in line with the positivity bias, I found that older adults were more motivated by positive information than negative information when compared to younger adults (Isaacowitz, Wadlinger, Goren, & Wilson, 2006; Orgeta, 2011). Finally, I found that older adults were more efficient in their regulation of affect, which may be due to older adults having more experience with emotion regulating strategies (Charles & Carstensen, 2007; Gross, 2008; Magai, 2008).

## **Do We Understand Ourselves?**

In these studies (Study I, Study II and Study III), anticipated emotions were shown to be more intense than experienced emotions. Projecting oneself into the future has been argued to be one of the most useful abilities imaginable, because by imagining an event we can feel the emotions from the event before it occurs. However, these studies show that accurate anticipation of emotions is difficult, and previous research has shown that people make systematic errors when they do affective forecasting (Wheeler, Stuss, & Tulving, 1997). Errors can, for example, stem from the hot-cold empathy gap, which makes it hard to predict how one will feel when in an opposite psychological state (e.g. hungry vs. full). The research presented in this thesis suggests that this might be transferable not only to emotional states but also to age: “younger” and “older”. Both younger and older adults overestimate their future and past happiness, respectively. Some research suggests that younger adults dread growing old (Lacey, Smith, & Ubel, 2006). However, this could not be replicated in this thesis, and in both Study I and Study II, older adults predicted stable or declining happiness in their future, while younger adults anticipated that they would have higher levels of happiness as they got older. When looking at the emotional life of older adults, my studies, as well as current research, does not support the idea that there is anything to dread in older age (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). The



differences in experienced emotions are much smaller than the difference between what people forecast and what they remember (Gilbert, Gill, & Wilson, 2002). This suggests that while current positive affect stays more or less constant, the way people perceive emotions in the past and the future changes greatly with age.

In Study I, older adults had the same or a slightly lower level of positive affect, but a substantially lower level of negative affect when asked about the emotions they felt in the preceding 4 weeks, when compared to younger adults. In study III, older adults had a lower level of regret of decisions in their daily life than younger adults. This is in line with research showing that well-being stays stable, but negative affect declines in older age (Blanchard-Fields & Coats, 2008; Blanchard-Fields, Stein, & Watson, 2004; D'Argembeau & Van der Linden, 2006; Mroczek, 2001; Silvers et al., 2012). The lower level of negative emotions suggests that older adults have strategies that give them more control of their emotional life than younger adults. In this thesis, I found support for this when looking at regret. However, there are strategies to reduce other kinds of negative emotion (Gross, 2003, 2008; Gross & John, 2003), and it seems likely that other negative emotions function in a similar way. Older people have more emotion regulation experience and it is not strange that they seem better at regulating their emotions. With age comes wisdom (Blanchard-Fields et al., 2004; Charles & Carstensen, 2007). Failure to regulate once negative emotions can lead to depression (Jo-

sephson, 1996) or violence (Davidson et al., 2000). Understanding how emotions and emotion regulation change naturally during the lifespan, and how these function in a real life setting, can help those having trouble regulating their emotions. One reason that could explain people's poor affective forecasting skill is that they fail to acknowledge the "psychological immune system" (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). If people want to understand their future selves, they must also understand that the way they regulate emotions develops with age, as their regulatory processes protect them against some of the negative consequences of growing older.

Viewed as a whole, this research points to some differences in younger and older adults affective responses, as well as in the way affect is regulated. Are the differences between younger and older adults so big that the age, or time, 'bridge' is impossible to overcome? Can we actually understand what it means to make decisions for our future selves when it seems so far away? Moreover, is it a good idea to let one group of people make decisions for another group of people who are substantially older or younger than they are? In addition to the real differences that exist, older adults are stereotyped in a negative way and a lot of prejudices against older adults are prevalent (Nelson, 2005). Research can help bridge this gap; knowledge about real differences between how older and younger adults process information and make judgments and decisions not only helps both younger and older adults, but can also be an aid for policymakers and politicians.

## **Growing Older is Not Only Decline**

The roman philosopher Cicero (106-43 B.C.) argued that old age is not a phase of decline and loss, but rather that old age brings opportunities of productive functioning, and that we should not confuse old age with sickness (Cicero, 1909). Today we know that Cicero was right in some instances, and that old age is not only connected to decline and loss (Baltes & Baltes, 1993). The argument that old age is not only a phase of decline is reinforced by the studies in my thesis. Study I showed that older adults had similar levels of happiness as younger adults, and Study II replicated this finding. Study III showed that older adults had less regret than younger adults, and Study IV show that older adults feel more positive consequences of doing nice things. This thesis is just one example of what a huge proportion of the research on the emotional life of older adults has shown. Taken together, older adults seem to have equal levels of well-being compared to younger adults. However, there seem to be differences in how older and younger adults process their emotions. Study II showed that older adults react more than younger adults to differences in arousal. Our main finding in Study II was that older adults' perceive happiness to be more in line with their perception of happiness when described as low in arousal, compared to happiness described as high in arousal, and therefore older adults rate their happiness higher when described as a low arousal state (compared to a high arousal state). The

younger participants remained uninfluenced by the happiness priming manipulation. These results are in line with the literature suggesting that older adults tend to avoid high arousal emotions, regardless of valence (Pinquart, 2001). This indicates that the preference for arousal differs between older and younger adults. Russell and Mehrabian (1978) suggested that all emotions are created by valence and arousal, and if there is an age-related difference in preference for arousal, this would influence preference for all emotions. Previous research on the positivity bias has sometimes compared negatively-valenced emotions (relatively higher in arousal) with positively-valenced emotions (relatively lower in arousal; Mather & Carstensen, 2003). Study IV, showed that older adults felt more positive emotions from charitable giving. This finding is in line with previous research on age-related positivity bias that has shown older adults draw more positive affect from stimuli material compared to younger adults (Kennedy, Mather, & Carstensen, 2004; Mather & Carstensen, 2005; Tomaszczyk, Fernandes, & MacLeod, 2008). However, no differences were shown in how much negative affect was drawn from the person in need, and younger and older adults felt as sad, upset, and worried when presented with a picture of the person in need. Therefore, our results support the notion of a positivity enhancement, and that older adults seem to maximize positive affect, rather than minimizing negative emotions. While Study IV is in line with previous research on age-related positivity bias for positive-valenced emotions (Kennedy, Mather, & Carstensen, 2004;

Tomaszczyk, Fernandes, & MacLeod, 2008), the results from Study II suggest that arousal avoidance may in fact contribute to the positivity bias, as negative emotions are higher in arousal. However, both the positivity bias and arousal avoidance are in line with the SST, and as goals change, the preference for low arousal positive emotions should increase (Carstensen, 1992). Overall, I find support that older adults have less negative emotions but also a life full of positive emotions that might be of a different kind than the positive emotions found in younger. However, I replicate the finding that the level of well-being stays constant as we age (Costa et al., 1987).

As a parallel to this we can look at health. We know that there is a decline in executive functioning when growing older that will have consequences for one's daily life (Salthouse, 1991; Salthouse, 1996). In the same way, there is a decline in other bodily functions and health, for example the likelihood of getting sick increases with age and the ability to move freely declines (Kirkwood, 1999). It has long been argued that external factors cannot influence levels of happiness (Brickman & Campbell, 1971). Studies have also shown that external sources thought to influence a person's happiness are not the only predictor of how we feel about the world (Brickman, Coates, & Janoff-Bulman, 1978). This view has been challenged, and we know that happiness can change, however research has shown that things people believe will change their happiness (such as winning one million dollars or losing mobility) might not influence happiness to any higher extent

(Diener, Lucas, & Scollon, 2006). A consequence of this is that the age-related losses in cognitive ability, as well as mobility, which younger people believe will influence their happiness greatly, might not at all have the impact they imagine. As people adapt to changes, and the “psychological immune system” helps people handle age-related decline, it seems like growing old is much more than just decline, it is also change and development.

## **Conclusion**

In conclusion, I propose that the intensity, accessibility, and instrumentality related to affect may differ between younger and older adults as an effect of three processes. First, the positivity bias: older adults avoid negative and prioritize positive information to a larger extent than younger adults (Carstensen, 1995; Gross et al., 1997; Tomaszczyk, Fernandes, & MacLeod, 2008). Second, preference for arousal: older adults seem to avoid high arousal happiness, which is in line with motivational shifts in older age (Carstensen, 1992). Further, differences in emotion regulatory strategies makes older adults better suited to handle negative emotions (Blanchard-Fields & Coats, 2008; John & Gross, 2004). In sum, the findings in this thesis suggest that experienced and anticipated affective consequences of decisions interact in their contribution to decision-making among both younger and older adults. However, there are age differences that need to be taken into account.

## **There are Always Alternatives**

This thesis builds on a view that we as humans develop during our whole life-span. But, more specifically, the studies in this thesis are based on the foundation Baltes (1987, 1990) has made with SOC, with the extension of Carstensen's (1992, 1995, 1999) work with the STT. Both of these theories have given grounds for age-related psychological research, and their influence on the field is not to be understated. Baltes and Baltes (1990) used SOC to explain age-related processes as compensating for age-related losses by focusing on remaining abilities. As SST is an extension of SOC, findings that fit into one should also fit into the other (Baltes & Carstensen, 1996). Both of these theories, especially when viewed together, can explain the positivity bias and therefore the results found in this thesis. However, so far the processes of how both SST and SOC actually work are relatively unknown, and the studies investigating these specific processes are few compared to the extent of which these theories are used (Scheibe & Carstensen, 2010). Many articles refer to a change in goals as we grow older, however, few (including those presented in this thesis) actually measure these goals and how they change. However, Fung and Carstensen (2004) actually measured the change in goals and showed that these created consequences for how people acted in different scenarios. Conversely, there are also alternative explanations for the findings in my thesis. Based on what we know about humans as biological

creatures, age comes with other naturally occurring biological changes, including changes in the brain. Brain structures change as we grow older, which leads to a decline in executive functioning. There is also evidence for age-related changes in structures connected to emotional processing, such as in the amygdala (Mather et al., 2004). This can explain why older adults, compared to younger adults, feel less affect, as a change in the brain could lead to overall less affective response. However, this would not explain why older adults say that they use more regret regulation strategies, as seen in Study III, or why they feel more positive affect after giving, as seen in Study IV.

Another explanation for the stability of well-being over the life-span could be the hedonic treadmill (Brickman & Campbell, 1971; Brickman, Coates, & Janoff-Bulman, 1978). This theory sees well-being as a consequence of stable personality traits rather than anything else. Therefore, the changes that come with age should not influence the level of well-being. However, the difference in preference for arousal seen in Study II cannot be explained by this theory. In addition, it is hard to fit the positivity bias into the hedonic treadmill theory, as are the findings in Study IV, in which older participants benefited more from charitable giving.

There are of course more alternative explanations to the findings in this thesis. Overall, the findings correspond with SOC and SST, however,



this thesis is based in a research tradition in which these theories are the most prominent.

## **Further Directions**

If I would have started with my thesis today there are some things that I would have done differently. Looking back however, I realize that at that time my knowledge in the field and methodology was limited, and even with the limitations in this thesis I firmly believe that this has been a process that has made me much more prepared for future research. In addition, finishing this thesis has made me realize how little I know, and that there are still so many questions that need answers. I hope that I, together with the network of researchers I have been working with these past years, will be able to answer some of them.

First of all I want to raise some thoughts about theory and missing pieces in life-span theory. There is an evident need to capture the processes underlying age-related change: the change in goals suggested from the STT, as well as the specialization suggested in SOC. Only when these differences are investigated in relation to changes in emotional processes over time can we prove that these underlying theories can explain the differences between older and younger adults shown in this thesis. In addition to measuring these underlying processes, we need to investigate how they relate to cognitive decline. As we know that emotion regulation requires cognitive ability, and

emotion regulation seems to be more efficient in older adults, the relationship between the two must be more complex than previously believed (Knight et al., 2007).

On a more practical note, understanding how decision-making functions outside of the lab is important for the validity of the judgment and decision-making field. When looking at differences between older and younger adults, this need for real-life studies becomes more pressing. Most of the current research uses younger participants, such as college students in a lab, which makes it difficult to know if the findings can be generalized to the broader public, and whether or not they can be applied to the real world. There are many situations in which the need for a better understanding of decision-making processes is essential to creating a setting that can help foster successful decisions. One good example is medicinal decision-making, in which the patient is in a particularly vulnerable situation. This is especially true for older adults in medicinal decision-making (Finucane et al., 2002). When it comes to things such as choosing between health-plan options, it is hard to correctly simulate this in an experimental setting. However, it is impossible, and unethical, to manipulate these decisions in real life. To manipulate how many kinds of strawberry jam are placed in a real life grocery store is both a smart way of investigating consumer behavior and ethical. To do a similar thing to patients when deciding what treatment to choose when it comes to their health is, of course, unacceptable. However, this type of re-

search is not impossible. Investigating how changes in the health care system influence decision-making and affect toward decisions is one way of capturing these processes in a real-life setting. Given that, the decision environment looks different in different places. Comparing different hospitals, states, or countries is another way of investigating differences in medicinal decision-making in a real life setting. More understanding of these decision-making processes can help create settings that maximize positive outcomes for groups that need to make decisions which will influence their quality of life in a very real way.

## **Limitations**

The conclusions drawn in this thesis should be viewed in light of its limitations. The main limitation is that the differences in these four studies can only be on the level of cohort differences. Further research on longitudinal samples will determine if these differences exists beyond the cohort level. The procedure employed for data collection in Study I was a pen and pencil survey completed at home, and for Study III and Study IV it was a computer based study, also completed at home. This means there was no control over the surrounding setting and no way of knowing whether or not different surroundings were associated with certain answers or patterns. Additionally, causality should be seen as a product of previous studies and theories. There

is room for alternative explanations, as well as underlying, unmeasured variables, which could explain associations seen in this thesis.

## References

- Anderson, C. J. (2003). The psychology of doing nothing: Forms of decision avoidance result from reason and emotion. *Psychol Bull*, *129*(1), 139. doi:10.1037/0033-2909.129.1.139
- Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental psychology*, *23*(5), 611 doi: 10.1037/0012-1649.23.5.611.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. *Successful aging: Perspectives from the behavioral sciences*, *1*, 1-34. doi: 10.1017/CBO9780511665684.003
- Baltes, P. B., & Baltes, M. M. (1993). *Successful aging: Perspectives from the behavioral sciences* (Vol. 4): Cambridge University Press.
- Baltes, P. B., & Smith, J. (1997). A systemic-wholistic view of psychological functioning in very old age: Introduction to a collection of articles from the Berlin Aging Study. *Psychology and aging*, *12*(3), 395. doi:10.1037/0882-7974.12.3.395
- Baltes, P. B., Staudinger, U. M., & Lindenberger, U. (1999). Lifespan psychology: Theory and application to intellectual functioning.

*Annual review of psychology*, 50(1), 471-507. doi:  
10.1146/annurev.psych.50.1.471

Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review*, 11(2), 167-203. doi:10.1177/1088868307301033

Beike, D. R., Markman, K. D., & Karadogan, F. (2009). What we regret most are lost opportunities: A theory of regret intensity. *Personality and Social Psychology Bulletin*, 35(3), 385-397. doi:10.1177/0146167208328329

Bentham, J. (1996). *An Introduction to the Principles of Morals and Legislation (Collected Works of Jeremy Bentham)*: Clarendon Press.

Blanchard-Fields, F., & Coats, A. H. (2008). The experience of anger and sadness in everyday problems impacts age differences in emotion regulation. *Developmental psychology*, 44(6), 1547. doi:10.1037/a0013915

Blanchard-Fields, F., Stein, R., & Watson, T. L. (2004). Age differences in emotion-regulation strategies in handling everyday problems. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 59(6), P261-P269. doi:10.1093/geronb/59.6.P261

- Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, *66*(8), 1733-1749. doi:10.1016/j.socscimed.2008.01.030
- Boninger, D. S., Gleicher, F., & Strathman, A. (1994). Counterfactual thinking: From what might have been to what may be. *Journal of personality and social psychology*, *67*(2), 297. doi:10.1037/0022-3514.67.2.297
- Bradburn, N. M. (1969). The structure of psychological well-being.
- Brickman, P., & Campbell, D. T. (1971). Hedonic relativism and planning the good society. In H. Apley (Ed.), *Adaptation-level theory* (pp. 287-305). New York: Academic Press.
- Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: is happiness relative? *J Pers Soc Psychol*, *36*(8), 917-927. doi: 10.1037/0022-3514.36.8.917
- Cabanac, M. (1992). Pleasure: the common currency. *Journal of theoretical Biology*, *155*(2), 173-200. doi:10.1016/S0022-5193(05)80594-6
- Camille, N., Coricelli, G., Sallet, J., Pradat-Diehl, P., Duhamel, J. R., & Sirigu, A. (2004). The involvement of the orbitofrontal cortex in the experience of regret. *Science*, *304*(5674), 1167-1170. doi:10.1126/science.1094550

- Carstensen, L. L. (1995). Evidence for a life-span theory of socioemotional selectivity. *Current Directions in Psychological Science*, 4(5), 151-156. doi:10.1111/1467-8721.ep11512261
- Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science*, 312(5782), 1913-1915. doi:10.1126/science.1127488
- Carstensen, L. L., & Lang, F. R. (1996). Future time perspective scale. *Unpublished manuscript, Stanford University*.
- Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of personality and social psychology*, 79(4), 644. doi:10.1037/0022-3514.79.4.644
- Charles, S. T., & Carstensen, L. L. (2007). Emotion regulation and aging. *Handbook of emotion regulation*, 307-327.
- Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of personality and social psychology*, 80(1), 136. doi:10.1037/0022-3514.80.1.136
- Cicero. (1909). *On old age* (Vol. Vol. 9). New York: Collier & Son.
- Clore, G. (1994). *Why emotions are felt*. New York: Oxford University Press.
- Cohen, G. (1996). Memory and learning in normal aging. *Handbook of the clinical psychology of aging*. England: John Wiley & Sons.



- Connolly, T., & Zeelenberg, M. (2002). Regret in decision making. *Current Directions in Psychological Science*, 11(6), 212-216. doi:10.1111/1467-8721.00203
- Coricelli, G., Critchley, H. D., Joffily, M., O'Doherty, J. P., Sirigu, A., & Dolan, R. J. (2005). Regret and its avoidance: a neuroimaging study of choice behavior. *Nature neuroscience*, 8(9), 1255-1262. doi:10.1038/nn1514
- Costa, P. T., Zonderman, A. B., McCrae, R. R., Huntley, J. C., Locke, B. Z., & Barbano, H. E. (1987). Longitudinal analyses of psychological well-being in a national sample: Stability of mean levels. *Journal of Gerontology*, 42(1), 50-55. doi:10.1093/geronj/42.1.50
- Critchley, H. D., Mathias, C. J., & Dolan, R. J. (2001). Neural activity in the human brain relating to uncertainty and arousal during anticipation. *Neuron*, 29(2), 537. doi:10.1016/S0896-6273(01)00225-2
- D'Argembeau, A., & Van der Linden, M. (2006). Individual differences in the phenomenology of mental time travel: The effect of vivid visual imagery and emotion regulation strategies. *Consciousness and Cognition*, 15(2), 342-350. doi: 10.1016/j.concog.2005.09.001
- Damasio, A. R. (1994). *Descartes' error*: Putnam New York.
- Davidson, R. J., Putnam, K. M., & Larson, C. L. (2000). Dysfunction in the neural circuitry of emotion regulation--a possible prelude to violence. *Science*, 289(5479), 591-594. doi:10.1126/science.289.5479.591

- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, *49*(1), 71-75. doi:10.1207/s15327752jpa4901\_13
- Diener, E., & Eunkook Suh, M. (1997). Subjective well-being and age: An international analysis. *Annual review of gerontology and geriatrics*, *17*, 304-324.
- Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: revising the adaptation theory of well-being. *American Psychologist*, *61*(4), 305. doi: 10.1037/0003-066X.61.4.305
- Diener, E., Sandvik, E., & Pavot, W. (2009). Happiness is the frequency, not the intensity, of positive versus negative affect. *Assessing well-being*, 213-231. doi:10.1007/978-90-481-2354-4\_10
- Finucane, M. L., Slovic, P., Hibbard, J. H., Peters, E., Mertz, C. K., & MacGregor, D. G. (2002). Aging and decision-making competence: an analysis of comprehension and consistency skills in older versus younger adults considering health-plan options. *Journal of Behavioral Decision Making*, *15*(2), 141-164. doi: 10.1002/bdm.407
- Forgas, J. P. (2001). *Feeling and thinking: The role of affect in social cognition*. Cambridge University Press.
- Forgas, J. P., & Bower, G. H. (1987). Mood effects on person-perception judgments. *Journal of personality and social psychology*, *53*(1), 53. doi:10.1037/0022-3514.53.1.53

- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218. doi:10.1037/0003-066X.56.3.218
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition & Emotion*, *12*(2), 191-220. doi:10.1080/026999398379718
- Freedman, J. L. (1978). *Happy people: What happiness is, who has it, and why*: Harcourt Brace Jovanovich New York.
- Frijda, N. H. (1987). *The emotions*: Cambridge University Press.
- Freud, S. (1964). *The standard edition of the complete psychological works of Sigmund Freud*. Oxford: Macmillan.
- Fung, H. H., & Carstensen, L. L. (2004). Motivational changes in response to blocked goals and foreshortened time: testing alternatives to socioemotional selectivity theory. *Psychology and Aging; Psychology and Aging*, *19*(1), 68. doi:10.1037/0882-7974.19.1.68
- Gilbert, D. T. (2006). *Stumbling on happiness*: Knopf.
- Gilbert, D. T., & Ebert, J. E. J. (2002). Decisions and revisions: the affective forecasting of changeable outcomes. *Journal of personality and social psychology*, *82*(4), 503. doi:10.1037/0022-3514.82.4.503
- Gilbert, D. T., Gill, M. J., & Wilson, T. D. (2002). The future is now: Temporal correction in affective forecasting. *Organizational*

*behavior and human decision processes*, 88(1), 430-444.

doi:10.1006/obhd.2001.2982

Gleicher, F. (1990). ACTIONS VERSUS INACTIONS. *Personality and Social Psychology Bulletin*, 16(2), 284-295.

doi:10.1006/obhd.2001.2982

Gleicher, F., Kost, K., Baker, S., Strathman, A., Richman, S., & Sherman, S. (1990). The role of counterfactual thinking in judgments of affect.

*Personality and Social Psychology Bulletin*, 16, 284-295.

doi:10.1177/0146167290162009

Goldin, P. R., McRae, K., Ramel, W., & Gross, J. J. (2008). The neural bases of emotion regulation: reappraisal and suppression of negative emotion. *Biol Psychiatry*, 63(6), 577.

doi:10.1016/j.biopsych.2007.05.031

Golub, S. A., Gilbert, D. T., & Wilson, T. D. (2009). Anticipating one's troubles: the costs and benefits of negative expectations. *Emotion*,

9(2), 277. doi:10.1037/a0014716

Gross, J. J. (2003). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, 39(3), 281-291.

doi:10.1017/S0048577201393198

Gross, J. J. (2008). Emotion regulation. In M. Lewis, J. M. Haviland-Jones & L. F. Barrett (Eds.), *Handbook of emotions* (3 ed., pp. 497-512). New York: Guilford Press.

- Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Götestam Skorpen, C., & Hsu, A. Y. C. (1997). Emotion and aging: experience, expression, and control. *Psychology and Aging; Psychology and Aging*, *12*(4), 590. doi:10.1037/0882-7974.12.4.590
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of personality and social psychology*, *85*(2), 348. doi:10.1037/0022-3514.85.2.348
- Grupe, D. W., & Nitschke, J. B. (2011). Uncertainty is associated with biased expectancies and heightened responses to aversion. *Emotion*, *11*(2), 413. doi:10.1037/a0022583
- Hess, T. M. (2000). Aging-related constraints and adaptations in social information processing. *Generative mental processes and cognitive resources: Integrative research on adaptation and control*, 129-155. doi:10.1007/978-94-011-4373-8\_5
- Hess, T. M. (2006). Adaptive aspects of social cognitive functioning in adulthood: age-related goal and knowledge influences. *Social Cognition*, *24*(3), 279-309. doi:10.1521/soco.2006.24.3.279
- Hoerger, M., Quirk, S. W., Lucas, R. E., & Carr, T. H. (2010). Cognitive determinants of affective forecasting errors. *Judgment and Decision Making*, *5*(5), 365.

- Hogarth, R. M., Portell, M., & Cuxart, A. (2007). What risks do people perceive in everyday life? A perspective gained from the experience sampling method (ESM). *Risk analysis*, 27(6), 1427-1439. doi:10.1111/j.1539-6924.2007.00978.x
- Hogarth, R. M., Portell, M., Cuxart, A., & Kolev, G. I. (2011). Emotion and reason in everyday risk perception. *Journal of Behavioral Decision Making*, 24(2), 202-222. doi:10.1002/bdm.689
- Hsee, C. K. (1995). Elastic justification: How tempting but task-irrelevant factors influence decisions. *Organizational behavior and human decision processes*, 62(3), 330-337. doi:10.1006/obhd.1995.1054
- Isen, A. M. (2000). Some perspectives on positive affect and self-regulation. *Psychological Inquiry*, 11(3), 184-187.
- John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of personality*, 72(6), 1301-1334. doi:10.1111/j.1467-6494.2004.00298.x
- Josephson, B. R. (1996). Mood regulation and memory: Repairing sad moods with happy memories. *Cognition & Emotion*, 10(4), 437-444. doi:10.1080/026999396380222
- Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. *Heuristics and biases:*

*The psychology of intuitive judgment*, 49-81.

doi:10.1017/CBO9780511808098.004

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological review*, 93(2), 136. doi:10.1037/0033-295X.93.2.136

Kennedy, Q., Mather, M., & Carstensen, L. L. (2004). The role of motivation in the age-related positivity effect in autobiographical memory. *Psychol Sci*, 15(3), 208-214. doi:10.1111/j.0956-7976.2004.01503011.x

Kirkwood, T. (1999). Time of our lives: why ageing is neither inevitable nor necessary. *Londres: Phoenix*.

Kirkwood, T. (2010). Global aging and the brain. *Nutrition reviews*, 68, S65-S69. doi:10.1111/j.1753-4887.2010.00343.x

Koole, S. L. (2009). The psychology of emotion regulation: An integrative review. *Cognition and Emotion*, 23(1), 4-41. doi:10.1080/02699930802619031

Kryla-Lighthall, N., & Mather, M. (2009). The role of cognitive control in older adults' emotional well-being.

Kunda, Z. (1990). The case for motivated reasoning. *Psychol Bull*, 108(3), 480. doi:10.1037/0033-2909.108.3.480

- Lacey, H. P., Smith, D. M., & Ubel, P. A. (2006). Hope I die before I get old: Mispredicting happiness across the adult lifespan. *Journal of Happiness Studies*, 7(2), 167-182. doi:10.1007/s10902-005-2748-7
- Landman, J. (1993). *Regret*: Oxford University Press.
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry*, 11(3), 129-141. doi:10.1207/S15327965PLI1103\_01
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267. doi:10.1037/0033-2909.127.2.267
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, 46(2), 137-155. doi:10.1023/A:1006824100041
- Lyubomirsky, S., & Ross, L. (1997). Hedonic consequences of social comparison: a contrast of happy and unhappy people. *Journal of personality and social psychology*, 73(6), 1141. doi:10.1037/0022-3514.73.6.1141
- MacPherson, S. E., Phillips, L. H., & Della Sala, S. (2002). Age, executive function and social decision making: A dorsolateral prefrontal theory of cognitive aging. *Psychology and Aging; Psychology and Aging*, 17(4), 598. doi:10.1037/0882-7974.17.4.598
- Magai, C. (2008). Long-lived emotions. *Handbook of emotions*, 376-388.



- Manucia, G. K., Baumann, D. J., & Cialdini, R. B. (1984). Mood influences on helping: Direct effects or side effects? *Journal of personality and social psychology*, 46(2), 357. doi:10.1037/0022-3514.46.2.357
- Mather, M., Canli, T., English, T., Whitfield, S., Wais, P., Ochsner, K., . . . Carstensen, L. L. (2004). Amygdala responses to emotionally valenced stimuli in older and younger adults. *Psychol Sci*, 15(4), 259-263. doi:10.1111/j.0956-7976.2004.00662.x
- Mather, M., & Carstensen, L. L. (2003). Aging and attentional biases for emotional faces. *Psychological Science*, 14(5), 409-415. doi:10.1111/1467-9280.01455
- McMullen, M. N. (1997). Affective contrast and assimilation in counterfactual thinking. *Journal of Experimental Social Psychology*, 33(1), 77-100. doi:10.1006/jesp.1996.1313
- Mellers, B. A., & McGraw, A. P. (2001). Anticipated emotions as guides to choice. *Current Directions in Psychological Science*, 10(6), 210-214. doi:10.1111/1467-8721.00151
- Mroczek, D. K. (2001). Age and emotion in adulthood. *Current Directions in Psychological Science*, 10(3), 87-90. doi:10.1111/1467-8721.00122
- Nabi, R. L. (2003). Exploring the Framing Effects of Emotion Do Discrete Emotions Differentially Influence Information Accessibility, Information Seeking, and Policy Preference? *Communication Research*, 30(2), 224-247. doi:10.1177/0093650202250881

- Nelson, T. D. (2005). Ageism: Prejudice against our feared future self. *Journal of Social Issues, 61*(2), 207-221. doi:10.1111/j.1540-4560.2005.00402.x
- Neumann, R., Seibt, B., & Strack, F. (2001). The influence of mood on the intensity of emotional responses: Disentangling feeling and knowing. *Cognition & Emotion, 15*(6), 725-747. doi:10.1080/02699930143000266
- Nielsen, L., Knutson, B., & Carstensen, L. L. (2008). Affect dynamics, affective forecasting, and aging. *Emotion, 8*(3), 318. doi:10.1037/1528-3542.8.3.318
- Peters, E. (2006). The functions of affect in the construction of preferences. *The construction of preference, 454-463*. doi:10.1017/CBO9780511618031.025
- Peters, E., Hess, T. M., Västfjäll, D., & Auman, C. (2007). Adult age differences in dual information processes: Implications for the role of affective and deliberative processes in older adults' decision making. *Perspectives on Psychological Science, 2*(1), 1-23. doi:10.1111/j.1745-6916.2007.00025.x
- Peters, E., Lipkus, I., & Diefenbach, M. A. (2006). The functions of affect in health communications and in the construction of health preferences. *Journal of Communication, 56*(s1), S140-S162. doi:10.1111/j.1460-2466.2006.00287.x

- Peters, E., Västfjäll, D., Gärling, T., & Slovic, P. (2006). Affect and decision making: A “hot” topic. *Journal of Behavioral Decision Making*, *19*(2), 79-85. doi:10.1002/bdm.528
- Piaget, J. (1959). *The language and thought of the child* (Vol. 5). London: Routledge.
- Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin*; *Psychological Bulletin*, *121*(1), 133. doi:10.1037/0033-2909.121.1.133
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological review*, *110*(1), 145. doi:10.1037/0033-295X.110.1.145
- Salthouse, T. A. (1996). The processing-speed theory of adult age differences in cognition. *Psychological review*, *103*(3), 403. doi:10.1037/0033-295X.103.3.403
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of personality and social psychology*, *45*(3), 513. doi:10.1037/0022-3514.45.3.513
- Schwarz, N., & Clore, G. L. (2003). Mood as information: 20 years later. *Psychological Inquiry*, *14*(3-4), 296-303. doi:10.1080/1047840X.2003.9682896

- Shafir, E., Simonson, I., & Tversky, A. (1993). Reason-based choice. *Cognition*, *49*(1), 11-36. doi:10.1016/0010-0277(93)90034-S
- Shiota, M. N., & Levenson, R. W. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging*, *24*(4), 890. doi:10.1037/a0017896
- Silvers, J. A., McRae, K., Gabrieli, J. D. E., Gross, J. J., Remy, K. A., & Ochsner, K. N. (2012). Age-Related Differences in Emotional Reactivity, Regulation, and Rejection Sensitivity in Adolescence.
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis*, *24*(2), 311-322. doi:10.1111/j.0272-4332.2004.00433.x
- Stacey, C. A., & Gatz, M. (1991). Cross-sectional age differences and longitudinal change on the Bradburn Affect Balance Scale. *Journal of Gerontology*, *46*(2), P76-P78. doi:10.1093/geronj/46.2.P76
- Stoeber, J., & Janssen, D. P. (2011). Perfectionism and coping with daily failures: positive reframing helps achieve satisfaction at the end of the day. *Anxiety Stress Coping*, *24*(5), 477-497. doi:10.1080/10615806.2011.562977

- Summerville, A. (2011). The Rush of Regret A Longitudinal Analysis of Naturalistic Regrets. *Social Psychological and Personality Science*, 2(6), 627-634. doi:10.1177/1948550611405072
- Tomaszczyk, J. C., Fernandes, M. A., & MacLeod, C. M. (2008). Personal relevance modulates the positivity bias in recall of emotional pictures in older adults. *Psychonomic Bulletin & Review*, 15(1), 191-196. doi:10.3758/PBR.15.1.191
- Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review*, 110(3), 403. doi:10.1037/0033-295X.110.3.403
- Van Dijk, E., & Zeelenberg, M. (2005). On the psychology of 'if only': Regret and the comparison between factual and counterfactual outcomes. *Organizational Behavior and Human Decision Processes*, 97(2), 152-160. doi:10.1016/j.obhdp.2005.04.001
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063. doi:10.1037/0022-3514.54.6.1063
- Veenhoven, R. (1995). World database of happiness. *Social Indicators Research*, 34(3), 299-313. doi:10.1007/BF01078689
- Wheeler, M. A., Stuss, D. T., & Tulving, E. (1997). Toward a theory of episodic memory: the frontal lobes and autonoetic consciousness. *Psychol Bull*, 121(3), 331. doi:10.1037/0033-2909.121.3.331

- Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting knowing what to want. *Current Directions in Psychological Science*, *14*(3), 131-134. doi:10.1111/j.0963-7214.2005.00355.x
- Wrosch, C., Bauer, I., & Scheier, M. F. (2005). Regret and quality of life across the adult life span: the influence of disengagement and available future goals. *Psychology and Aging*, *20*(4), 657. doi:10.1037/0882-7974.20.4.657
- Wrosch, C., & Heckhausen, J. (2002). Perceived control of life regrets: Good for young and bad for old adults. *Psychology and Aging*, *17*(2), 340. doi:10.1037/0882-7974.17.2.340
- Västfjäll, D., Peters, E., & Bjälkebring, P. (2010). The Experience and Regulation of Regret Across the Adult Life Span *Emotion Regulation and Well-Being* (pp. 165). New York: Springer.
- Zeelenberg, M. (1999a). Anticipated regret, expected feedback and behavioral decision making. *Journal of Behavioral Decision Making*, *12*(2), 93-106. doi:10.1002/(SICI)1099-0771(199906)12:2<93::AID-BDM311>3.0.CO;2-S
- Zeelenberg, M. (1999b). The use of crying over spilled milk: A note on the rationality and functionality of regret. doi:10.1080/095150899105800
- Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology*, *17*(1), 3. doi:10.1207/s15327663jcp17