Competence, Styles, and Quality in Everyday Decision Making

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Sweden 2015

Printed in Sweden
Ale Tryckteam, Bohus 2015
ISSN: 1101-718X
ISBN: 978-91-628-9589-1
ISRN: GU/PSYK/AVH--321—SE
http://hdl.handle.net/2077/40516

DOCTORAL DISSERTATION IN PSYCHOLOGY

ABSTRACT

Geisler, M. (2015). *Competence, styles, and quality in real-life decision making*.
Department of Psychology, University of Gothenburg, Sweden

This thesis had three aims. First, it explored the benefits of expanding the existing cognitively-oriented definition of individual differences in decision-making competence (i.e., measured by performance on traditional decision-making tasks) by including decision-related aspects of social skills and time-approach. Second, it investigated how an objective and normatively defined indicator for real-life decision-making outcome(s) relate to other, subjective indicators. Third, it examined if decision-making styles relate to individual characteristics in terms of social skills and time-approach.

Study 1 used questionnaires and included three sub-studies. Study 1.1 targeted a community sample, and Study 1.2 and Study 1.3 examined two samples of professionals (Study 1.2 – police investigators; Study 1.3 – social workers). Study 1.1 explored how an objective and normative indicator for decision-making outcome (the *Decision Outcome Inventory*: DOI) relates to subjective indicators (measured by *satisfaction with life* and *experiences of daily hassles*). Study 1.2 and Study 1.3 explored how decision-making competence measured by cognitively-oriented skills (the *Decision-Making Competence scale*: DMC), social skills/competence (*self-monitoring ability* and *trait emotional intelligence*), and time-approach (*time-styles* and *procrastination behavior*) respectively predict subjective and objective indicators of outcomes. The results showed that objective and subjective outcome indicators were related. Furthermore, DMC performance did not predict the variance in outcomes. However, competence in terms of social skills and time-approach were significant predictors for the variance in outcomes.

Study 2 further explored the predictive validity of the three competence factors in Study 1 by investigating if individual differences in these skills explain decision-making outcome indicated in terms of *perceived stress*. Study 2 included two sub-studies. Study 2.1 used a university student sample and Study 2.2 used the same sample of police investigators as in Study 1.2. Except for the different outcome measure used, the materials and procedure of Study 2 were largely the same as in Study 1. Results confirmed the findings of Study 1 by demonstrating that DMC performance did not predict levels of perceived stress, but social skills/competence and time-approach did.

Study 3 used the same samples, materials and procedure as Study 2 but analyzed the relationship between social skills/competence, time-approach and reports of *decision-making styles*. Results show that styles reflecting if and when decisions are made (i.e., the Avoidant and Dependent styles) were related to, and could to some extent be explained by, social skills and time-approach. However, only weak relationships were observed between social skills and time-approach and the styles that reflect how decisions are made (i.e., the Rational, Intuitive and Spontaneous styles).

In total, the results from the three studies demonstrate the importance of attending to social skills and time-approach in order to gain a better understanding of individual differences in decision making. The results demonstrate the benefits of using multi-faceted criteria for evaluating decision quality.

Keywords: Decision making, Decision-making competence, Decision-making styles, Decision quality, Decision outcome, Social skills, Time-approach

ISBN: 978-91-628-9589-1 ISSN 1101-718X ISRN: GU/PSYK/AVH--321—SE

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List of Appended Papers

I. Geisler, M., & Allwood, C. M. (2015). Competence and quality in real-life decision making. *Manuscript submitted for publication*

II. Geisler, M., & Allwood, C. M. (2015). Cognitive decision making, social approach and time-approach associations with perceived stress. *Manuscript submitted for publication*

III. Geisler, M., & Allwood, C. M. (2015). Relating decision-making styles to social orientation and time-approach. *Manuscript submitted for publication*

Sammanfattning på svenska (Swedish summary)

Varje dag ställs människor inför en mängd beslutssituationer. Samtidigt som vissa beslut är av vardaglig karaktär och mindre betydelse, så är andra beslut mycket viktiga och kan ofta medföra långtgående konsekvenser. Många beslut har konsekvenser för beslutsfattaren, så väl som för andra personer som på olika sätt påverkas eller är beroende av dessa (t.ex. familj, kollegor). En persons förmåga att kunna fatta bra beslut är därför en viktig egenskap. Men hur kan denna förmåga eller *beslutskompetens* definieras? Dessutom, vilka utfall av beslutsfattande (indikatorer på beslutskvalitet) kan, och borde, en definition av beslutskompetens kunna förklara? Den här avhandlingen avser att bidra till en förbättrad förståelse av detta.

Ett grundläggande antagande i denna avhandling är att många beslut i personers vardag och yrkesliv fattas i sociala och komplexa sammanhang. I dessa sammanhang kan det antas att en kompetent beslutsfattare oftast behöver anpassa, förankra och få stöd av andra personer för att kunna fatta framgångsrika beslut. Detta innebär att social förmåga/social kompetens utgör en viktig aspekt av beslutskompetens. På liknande sätt behöver en kompetent beslutsfattare ofta påbörja, strukturera och koordinera sitt beslutsfattande på ett lämpligt sätt för att kunna fatta bra beslut. Det innebär att förhållningssätt till tid utgör ytterligare en viktig aspekt av beslutskompetens. Vidare, sett till att beslutsfattande ofta sker i sociala och komplexa sammanhang, så framhåller avhandlingen även betydelsen av att se till personers subjektiva erfarenheter av sitt beslutsfattande för att förstå beslutskvalitet/framgångsrikt beslutsfattande.

I avhandling undersöks tre frågeställningar. Den första frågan är om en existerande, kognitivt orienterad definition av beslutskompetens med fördel kan utvidgas genom att inkludera beslutsrelaterade aspekter av social förmåga och förhållningssätt till tid (Studie 1-2). Den andra frågan är om en objektivt definierad indikator för utfall av personers vardagliga beslutsfattande är relaterad till subjektivt definierade utfall av vardagligt beslutsfattande Studie 1). Den tredje frågan är om skillnader i hur personer vanligtvis, och fördragsvis, hanterar sitt beslutsfattande är relaterade till skillnader i social förmåga och förhållningssätt till tid (Studie 3).

Traditionell beslutsfattandeforskning har visat att personers beslutsfattande kan påverkas av irrelevant information eller av ovidkommande förändringar i sammanhanget. Oftast, men inte alltid, har det visat sig att en sådan påverkan resulterar i en försämrad beslutskvalitet. Forskningen har även visat att individuella skillnader i denna påverkan är relativt stabila. Med denna utgångspunkt sammanställde forskarna Bruine de Bruin, Parker och Fischhoff (2007) olika välstuderade beslutsuppgifter, avsedda att mäta centrala aspekter av förmågan att kunna undvika sådan påverkan, till en sammansatt skala: Beslutskompetensskalan (*Decision Making Competence scale*: DMC). Kortfattat så avser skalan att mäta individers förmåga att kunna fatta korrekta, respektive konsistenta, beslut. Forskning har visat att denna definition av beslutskompetens är en specifik förmåga som i sig bidrar till att förklara i vilken utsträckning personer når framgång i sitt beslutsfattande. Exempelvis så har prestation på

Beslutskompetensskalan visat sig vara relaterat till: att kunna undvika (objektivt definierade) negativa konskevenser av sitt vardagliga beslutsfattande, beslutsförmåga hos ledare, riskbeteende hos ungdomar, skolprestation och ekonomisk planering. Ytterligare en viktig aspekt av de förmågor som Beslutskompetensskalan mäter är att de i viss mån antas kunna gå att förbättra och därigenom kunna bidra till att personer blir bättre beslutsfattare.

Förutom att se till personers förmåga att kunna fatta normativt rationella (dvs. korrekta och konsistenta) beslut så har framgångsrikt beslutsfattande också visat sig kunna förklaras av skillnader i hur personer genomför och förhåller sig till beslutsfattande. Inom beslutsfattandeforskningen studeras detta genom att se till så kallade beslutsstilar. En stor mängd forskning har visat på att skillnader i beslutsstilar påverkar olika typer av beslutsframgång, både objektiva (t.ex. undvika negativa konsekvenser, andra personers bedömningar av beslut) och subjektiva (t.ex. upplevd stress, depression och välbefinnande). Förståelsen för hur individuella skillnader i beslutsstilar kan förklaras är dock till stor del bristfällig. Avhandlingen avser att bidra till denna förståelse genom att undersöka om och hur beslutsstilar är relaterade till personers sociala orientering och förhållningssätt till tid.

Vad som är eller kännetecknar ett bra beslut är en central, men både omdiskuterad och oklar fråga inom beslutsfattandeforskningen. Exempelvis är det oklart om kvalitet ska fokusera på beslutsprocessen eller beslutsutfallet. Det råder också oenighet i frågan om forskningen behöver utvidga sitt traditionella fokus på att utvärdera kvaliteten av eller korrektheten i beslut utifrån normativt formulerade standarder av rationalitet. Forskare som företräder ett utvidgat fokus har bl.a. framfört att den sociala funktionen och de subjektiva konsekvenserna av beslutsfattande är minst lika viktiga att se till. Avhandlingen uppmärksammar dessa bägge fokus och utforskar hur olika indikatorer av detta är relaterade. Då en definition av beslutskompetens kräver lämplig(a) definition(er) av beslutskvalitet, undersöker också Avhandlingen hur olika de ovan nämnda aspekter av beslutskompetens bidrar till att förklara dessa typer av utfall.

Studie 1 bestod av tre studier. I Studie 1.1 fick deltagare i ett befolkningsrepresentativt stickprov besvara olika skalor och mått som indikerade objektiva och subjektiva indikatorer för utfall av beslutsfattande. Deltagarna fick rapportera i vilken utsträckning som de hade upplevt vardagliga bekymmer i olika områden i livet den senaste månaden, i vilken utsträckning de bedömer sig vara tillfreds med livet och anser sig att hittills lyckats nå sina mål i stort, samt besvara frågor om konkreta erfarenheter som de har haft under de senaste tio åren. Vardagliga bekymmer och tillfredsställelse avsågs mäta indikatorer på subjektiva konsekvenser av beslutsfattande och rapportering av konkreta erfarenheter avsågs att ge ett objektivt mått på förmågan att kunna undvika konsekvenser av beslutsfattande. Resultatet visade att personer som lyckats undvika negativa konsekvenser också rapporterade färre vardagliga bekymmer. Personer som rapporterade att ha upplevt fler vardagliga bekymmer uppgav också lägre nivåer av välbefinnande i livet i stort. Däremot återfanns inget signifikant samband mellan nivåer av välbefinnande och erfarenheter av negativa konsekvenser.

Studie 1.2 vände sig till yrkesverksamma personer (polisutredare). Deltagarna fick besvara ett testbatteri med mått och skalor på kognitivt orienterad beslutskompetens (DMC), social förmåga (social medvetenhet/självpresentation och emotionell intelligens), samt förhållningssätt till tid (hur man ser på, hanterar och känner inför tid och tidsrelaterade aktiviteter). Deltagarna rapporterade också i vilken utsträckning de upplevt vardagliga bekymmer och besvara frågor om välbefinnande. Resultaten visade att kognitivt orienterad beslutskompetens inte kunde förklara utfallet av vardagliga bekymmer eller välbefinnande. Däremot visade resultaten att både social och tidsorienterad beslutskompetens kunde förklara utfall av både vardagliga bekymmer och välbefinnande.

I Studie 1.3 bestod deltagarna också av yrkesverksamma personer (socialsekreterare). Studie 1.3 innehöll samma mått och skalor som i Studie 1.2, men här fick deltagarna också besvara i vilken utsträckning man lyckats undvika objektivt definierade, negativa konsekvenser av sitt beslutsfattande. Resultatet av Studie 1.3 bekräftade i stort resultatet från Studie 1.1. I Studie 1.3 erhölls dock ett signifikant samband mellan rapporterat välbefinnande och att ha lyckats undvika negativa konsekvenser av sitt beslutsfattande. Resultatet av Studie 1.3 visade återigen att kognitivt orienterad beslutskompetens inte förklarade utfallet i något av de inkluderade utfallsmåtten. Samtidigt bekräftades resultatet från Studie 1.2 då både socialt och tidsorienterad beslutskompetens förklarade utfallet i samtliga tre utfallsmått.

Studie 2 undersökte om och i vilken utsträckning som de tre aspekterna av beslutskompetens (kognitivt-, socialt-, och tidsorienterad) kunde förklara andra utfall av beslutsfattande än de som studerades i Studie 1. I Studie 2 fungerade mått på upplevd stress som indikation på subjektiva konsekvenser av beslutsfattande. Studie 2 bestod av två studier. Deltagarna i Studie 2.1 var universitetsstudenter och i Studie 2.2 samma yrkesverksamma deltagare (polisutredare) som i Studie 1.2. Utöver att deltagarna fick besvara en skala som mäter upplevd stress så var material och procedur i huvudsak det samma som för Studie 1.2 och 1.3. Resultaten för Studie 2 visade på att kognitivt orienterad beslutskompetens inte bidrog till att förklara utfall av beslutsfattande i termer av upplevd stress. Däremot visade resultatet att både socialt och tidsorienterad beslutskompetens bidrog till att förklara upplevd stress. Dessa övergripande resultat återfanns i både Studie 2.1 och Studie 2.2.

Studie 3 undersökte hur beslutsstilar är relaterade till social förmåga/kompetens och förhållningssätt till tid. Studie 3 bestod av två studier. I Studie 3.1 deltog samma deltagare som i Studie 2.1 (universitetsstudenter) och deltagarna i Studie 2.2 var samma yrkesverksamma deltagare som i Studie 1.2 och 2.2. Analyserna i Studie 3 utgick således från samma mätningar av sociala förmågor och förhållningssätt till tid, men relaterade dessa till deltagarnas rapportering av beslutsstilar. Resultatet visade att skillnader i social förmåga/social karaktär och tidshantering är relaterade till beslutsstilar. Detta var särskilt tydligt för de beslutsstilar som reflektera om och när beslut fattas (Beroende respektive Undvikande beslutsstil). Resultatet gav också ett visst stöd för att skillnader i social förmåga/social karaktär och förhållningssätt till tid kan bidra till att förklara särskiljandet mellan dessa bägge beslutsstilar. Sett över de två studierna så återfanns däremot endast svaga och sporadiska samband mellan social förmåga/kompetens och förhållningssätt till tid i

relation till de stilar som reflekterar hur beslut fattas (Rationell, Intuitiv och Spontan beslutsstil).

Sammantaget visar resultaten från avhandlingens tre studier att beslutsrelaterade aspekter av social förmåga och tidshantering är viktiga att inkludera för att förstå individuella skillnader i beslutsfattande. Mer specifikt visar resultaten från två av avhandlingens studier (Studie 1-2) att den existerande, kognitivt orienterade definitionen av beslutskompetens inte bidrog till att förklara subjektiva konsekvenser av beslutsfattande. Med andra ord, skillnader i förmågan att kunna fatta normativt korrekta och konsistenta beslut verkar inte nödvändigtvis ha betydelse för subjektiva indikatorer av beslutsfattande i form av vardagliga bekymmer, välbefinnande eller upplevd stressnivå. I Studie 1.3 kunde inte heller den tidigare rapporterade relationen mellan kognitivt orienterad beslutskompetens och objektivt definierade utfall av beslutsfattande replikeras. Samtidigt visar resultaten från samma två studier (Studie 1-2) att skillnader i förmågan att kunna anpassa beslutsprocesser utifrån skiftande sociala krav bidrar till att förklara utfall av beslutsfattande. På samma sätt visar resultaten att skillnader i hur personer ser på, hanterar och känner inför tid också bidrar till att förklara utfall av beslutsfattande.

För att återknyta till avhandlingens tre huvudfrågor så visar resultaten av avhandlingens tre studier att en definition av beslutskompetens med fördel bör inkludera beslutsrelaterade aspekter av social förmåga och förhållningssätt till tid. Vidare så visar resultaten på en relation mellan objektivt definierade utfall av beslutsfattande och subjektiva konsekvenser av beslutsfattande. Detta åskådliggör att beslutskvalitet kan, eller bör, utforskas mångfasetterat. Slutligen, aspekter av skillnader i socialt och tidsmässigt förhållningssätt är i viss utsträckning relaterade till skillnader i beslutsstil.

Acknowledgements

My thanks go out to a number of people who have helped and supported me in the work with this thesis. However, I also thank those who, at times, have helped me to displace it completely.

First of all I thank my supervisor Professor Carl Martin Allwood. The importance of your support and guidance during these years is hard to summarize. But I will give it a try. First of all, your positive attitude and curiosity has been an inspiration. It is remarkable that you are so eager and enthusiastic to discuss and/or try to resolve almost every question that comes your way. In combination with your huge knowledge, and ability to see opportunities in adversity, you have encouraged me to move forward. I am truly grateful for having got to know you and received your excellent guidance. Thank you!

However, work is *not* the most important thing in life. To me, what matters the most are you: Charlotte and Herman. Therefore, I would like to take this opportunity to thank you Charlotte. Just the thought of you make my day. I am so very lucky to have you by my side and truly blessed to be chairing my life with you. I love you. But this is not enough, for I have been blessed twice. Herman, my dear son, how fortunate I am to have you in my life. You are my number one, always.

I am also grateful to my parents and my friends. Your love and support mean so very much to me and is reassuring. You know who you are!

That being said, I would also like to thank a number of additional people for their support and/or contribution.

I thank my friends at the Department: Sandra (keep on rockin'), Simon (secret-agent), Erik (nuair a imíonn an leann, imíonn an greann), Olof (advocate for the United religion), Bodil, Niklas, Carl-Christian, Leif, Uta, Annika, David, and Marie-Louise.

In a more past-oriented perspective: I would like to express my gratitude to PhD Jean-Christophe Rohner and Professor Fredrik Björklund at Lunds university's Department of Psychology. When I began my efforts to become a PhD-student, your support and positive attitude really meant a lot to me.

I would also like to extend my thanks to all participants in the studies reported in this thesis and to the contact persons in the different organizations where I have had the privilege to conduct my studies. Without the time and effort of all of you, this research would not have been possible.

Finally, I am grateful to the Swedish Research Council for Health, Well-fare and Working Life (FORTE) for having funded this research.

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Introduction

"*Life is the sum of all your choices*" – Albert Camus

Life consists of an endless number of decisions, from minor decisions like what to have for dinner to major decisions like what career to pursue or where to live. Major or minor, the decisions people make will affect their lives and, ever so often, also the lives of others (e.g., family, colleagues). Hence, being able to make good decisions is essential.

The goal of behavioral decision-making science is to examine what decisions people make, investigate how these decisions are made, and ultimately to provide recommendations in order to reduce gaps between ideal and actual decisions (Baron, 2012; Fischhoff, 2010; Milkman, Chugh & Bazerman, 2009). In the last decade, research has begun to explore the factors and individual difference variables that characterize a successful decision-maker. This research has mainly focused on decision-making *competence* and decision-making *styles*. In brief, research on decision-making competence has found that the skills measured by traditional decision-making tasks seem to comprehend abilities of direct importance for individuals' real-life decision-making outcomes (Bruine de Bruin, Parker & Fischhoff, 2007; Parker & Fischhoff, 2005; see also Bruine de Bruin, Del Missier & Levin, 2012). Furthermore, research on decision-making styles has demonstrated that how people prefer to approach decision making (i.e., style) also holds predictive validity for different indicators of decision-making outcomes and success (e.g., Dewberry, Juanchich & Narendran, 2013a; Parker, Bruine de Bruin & Fischhoff, 2007).

Considering the immense importance of good decision making, these results show great promise for research to specify recommendations and prescriptions aimed at improving people's decision making (Bruine de Bruin, 2013; Wallin, 2013). However, it is relevant to consider to what extent the reported external validity holds true for various indicators of peoples' everyday understanding and experience of decision-making success. Furthermore, due to the complexity of everyday life, it is also relevant to investigate if there are aspects of competence that can provide further explanation of the variances in success.

This thesis is based on the insights from previous research on decision-making competence and decision-making styles and aims to complement and develop these important lines of research. The thesis targets three key issues. First, the thesis takes a somewhat broader

approach to decision-making competence than previous research by acknowledging that decision-making efficiency often depends on social concerns and temporal aspects. Second, in this context, the thesis explores and discusses the issue of adequate criteria for evaluating *decision quality*. Concisely stated, a basic assumption in this research is that when criteria for real-life decision-making outcomes are defined, subjective experiences of decisions and outcomes should not be neglected (Higgins, 2000; Keys & Schwartz, 2007; Wood & Highhouse, 2014). Third, the thesis investigates how attending to personal characteristics in terms of social orientation and time-approach can help to understand why individuals prefer to approach decision making in certain ways.

Demands on everyday decision making

Decision-making demands have increased in recent decades, especially in Western societies (Schwarz, 2004). For example, many decisions are associated with a larger number of decision alternatives (i.e., *choice overload*), a development that in turn may have negative effects on people's satisfaction with their decisions (Inbar, Botti & Hanko, 2011; Roets, Schwartz & Guan, 2012; Schwartz et al., 2002; however, see Scheibehenne, Greifender & Todd, 2010). Similarly, people face a growing need to switch perspectives in their decision making. For example, to shift focus between self-interest and the collective best, a process that has been demonstrated to reduce subjective decision-confidence (Hamilton, Vohs, Sellier & Meyvis, 2011).

A perhaps even more serious concern in everyday decision making is the fact that nearly every decision is potentially subject to evaluations and judgments by others (e.g., family, colleagues, social media, and investigative journalism). Increased work demands and complexity have also been observed in working-life decision making. This is exemplified by the increased lack of control over work, insufficient feedback on performance, high job uncertainty, and cumulative expectations that employees adapt to changing work conditions (Mark & Smith, 2008).

The argument in this thesis is that this increase in demands means decision-makers must be able to make decisions that are sensitive to, and respond to, accountability pressure (Green, Visser & Tetlock, 2000; Keren & Bruine de Bruin, 2003; Lerner & Tetlock, 1999; Tetlock, 1985). Consequently, a fundamental assumption in this thesis is that a valid, comprehensive

and applicable definition of decision-making competence should explain people's ability to respond to these everyday decision-making demands.

The complexity and social nature of everyday decision making

Day-to-day decision making is diverse in nature and importance. Yet an essential feature of many real-life decisions is that they are made in complex social settings in which decision-makers often require information and/or approval from other people in order to be successful (Allwood & Hedelin, 2005; Lerner & Tetlock, 1999). It has also been argued that efficient decision making requires the ability to adapt decision-making processes in accordance with changing demands in the social environment (Frith & Singer, 2008; Rilling & Sanfey, 2011; Sanfey, 2007; Tetlock, 1985, 2002).

In line with this argument, it has been proposed that a competent decision-maker has to think about how others think (i.e., metacognition-others) and be able to process information, update and adapt decision goals accordingly (Smith, Shanteau & Johnson, 2004). Moreover, everyday decision making often requires the integration of different sources of information, of which social cues are one (Averbeck & Duchaine, 2009). One suggestion is that the ability to correctly attend to social cues affects decision-making performance (Ramsøy, Skov, Macoveanu, Siebner & Fosgaard, 2014; Telle, Senior & Butler, 2011).

Furthermore, most decisions relate to time. For instance, some decisions are best made immediately whereas other decisions may benefit from delay. Previous research highlights time as a fundamental dimension in people's decision making (e.g., see Loewenstein, Read & Baumeister, 2003). More specifically, the most crucial factor of time for in individuals' decision making has been proposed to be how time is perceived (e.g., Claessens, van Erde, Rutte & Roe, 2007; Stratham, Gleicher, Boninger & Edwards, 1994; Usunier & Valette-Florence, 2007; Wittman & Paulus, 2007; Zimbardo & Boyd, 1999). In everyday life, decision-making processes often stretches over long time periods. Therefore, having an appropriate perception of time (e.g., an accurate sense of the duration of time) and having a structured disposition towards the management and overall use of time (e.g., to start, plan and execute activities effectively) may likely affect decision quality and decision-making success.

Aim of the Thesis

The main purpose of this thesis is to increase our understanding of the factors and variables that contribute to positive decision-making outcomes in peoples' everyday lives including their work lives. The emerging research field in decision-making science specifically dedicated to *decision-making competence* inspired this thesis (Bruine de Bruin et al., 2012).

Previous research on decision-making competence has specifically explored how individual differences in the skills measured by traditional decision-making tasks (i.e., mostly cognitive skills) relate to people's real-life decisions (Bruine de Bruin et al., 2007). At the same time, it has been suggested that explorations of decision-making competence provide insights into which cognitive and non-cognitive processes contribute to decision-making ability and to positive, real-life decision outcomes (Bruine de Bruin et al., 2012). However, as described in more detail below, it may be argued that the prevailing definitions of decision-making competence and real-life decision-making outcomes are somewhat limited. Decision-making competence has mainly been defined by performance on tasks derived from traditional decision-making research; real-life decision-making outcomes have mainly been defined objectively and by taking a normative approach (Bruine de Bruin et al., 2007; Parker & Fischhoff, 2005).

Recently, however, decision-making competence research has begun to acknowledge explicitly that competence not only depends on cognitive abilities but also on affective skills and experience (Bruine de Bruin, Parker, & Strough, 2014; see also Strough, Parker & Bruine de Bruin, 2015). Thus, in line with these recent developments in research, the aim of the three studies of this thesis is to complement previous research by exploring the benefits of taking a broader approach to decision-making competence. This exploration focuses on the predictive power of factors, other than basic cognitive abilities, that are likely to contribute to the success of people's everyday decision making. Specifically, the claim in this thesis is that decision-related aspects of social skills/competence and time-approach should be included in a broader concept of decision-making competence.

A brief account of decision-making research is presented next, followed by a description of the specific research field dedicated to decision-making competence. Thereafter, a description of an existing measure of decision-making competence is presented. This description is complemented by a brief summary of the research that has reported relationships between this

measure and various outcomes. Then, a selective overview of the research on decision-making styles is given that mainly addresses suggestions of how stylistic differences can be explained as well as reports on the relationships of these differences. In the next section the issue of decision quality is discussed, focusing on the difficulties of establishing criteria for real-life decision making. Thereafter, the theoretical basis and relevance of incorporating social skills and time-approach to the definition of decision-making competence is proposed and argued for. Finally, summaries of the three empirical studies in the thesis are presented and a general discussion follows.

Decision-making Research

Early research on decision making primarily evolved from the assumption that normative models should (and could) be used to evaluate decisions. These normative models were formulated in terms of *expected utility*, assuming that people are able to make rational decisions, whereby they comprehensively consider different decision-alternatives in terms of probabilities (*expectations*) and values (*utilities*), ultimately resulting in optimal outcomes (Loewenstein, 2001; Shafir & LeBoeuf, 2002). However, the basic assumptions of expected utility theory have been questioned and repeatedly refuted by a vast amount of research. For example, research in the heuristic and biases program has persuasively demonstrated that these assumptions are often unfulfilled (Gilovich, Griffin & Kahneman, 2002).

To illustrate, expected utility theory assumes that people have access to all relevant information in order to make rational decisions. The theory also assumes that people's preferences are fixed and clearly defined. Yet research has shown that these assumptions are generally inadequate as preferences are constructed (Bettman, Luce & Payne, 1998), changing (Fischhoff, Slovic & Lichtenstein, 1980), miss predicted (Hsee & Hastie, 2006) or unknown (Kahneman, Wakker & Sarin, 1997).

In brief, numerous studies have demonstrated that decisions frequently deviate from normative standards in various ways because of people's limited capacity to process information or due to a reliance on various inferential shortcuts and other types of cognitive biases (Gilovich et al., 2002; Kahneman & Tversky, 2002). Additionally, in recent decades researchers have demonstrated that affect can have heuristic influence on judgments and decisions in much the same way (Slovic, Finuance, Peters & McGregor, 2002). However, even though it has been demonstrated that both cognitive shortcuts and affective cues often

have problematic effects on people's decision making, it has also been demonstrated that decisions based on such heuristics may sometimes be beneficial, preferable or even essential (Bechara & Damasio, 2005; Gigerenzer & Gaissmaier, 2011; Mikels, Maglio, Reed & Kaplowitz, 2011).

Decision-making Competence

In the complexity of everyday life, people often find themselves in decision situations where they lack prior experience (Smith et al., 2004). When facing such novel decisions, it has been argued that individuals' success depends on a general decision-making ability of being capable to attend to the relevant information, to apply appropriate values in the decision context, and to assimilate information and values with adequate decision-rules (Parker & Fischhoff, 2005). Furthermore, in such situations, it has been proposed and reported that people who are able to make decisions according to normative standards of rationality generally will make better decisions, and consequently achieve more positive outcomes than people who do not follow these standards (Bruine de Bruin, 2012; Bruine de Bruin et al., 2007; Fischhoff, 2010). The question then is: Can individual differences in this ability be measured?

Initially, researchers explored individual performance on various traditional decision-making tasks. The results of these studies revealed internal consistency and inter-correlations. That is, individual differences in the departure from normative standards suggested rather consistent deficiencies in performance on decision-making tasks such as under/overconfidence and hindsight bias (Stanovich & West, 2000). Moreover, the results also showed that individual differences in performance were partly differentiated from general intelligence and cognitive ability. In sum, these results were interpreted as illustrating that individual differences in decision-making ability constitute a "positive manifold" (Stanovich & West, 2000; see also Stanovich & West, 2008). As a consequence, this research helped pave the way for behavioral decision-making research to exit the laboratory and to respond to criticism that questioned the relevance of these individual differences (e.g., Gigerenzer & Goldstein, 1996) by exploring external and predictive validity.

Measuring decision-making competence

Based on a normative approach to decision making, it has been proposed that general decision-making ability depends on four fundamental skills: *consistency in belief assessment* (be able to judge the likelihood of outcomes), *consistency in value assessment* (evaluating outcomes), *information integration* (combining belief and value assessments in decisions) and *metacognition* (knowing the extent of one's abilities) (Bruine de Bruin et al., 2007; Del Missier, Mäntylä & Bruine de Bruin, 2012).

Building on the research on consistent individual performance differences in decision-making tasks (e.g., Stanovich & West, 2000), Parker and Fischhoff (2005) and Bruine de Bruin et al. (2007) developed and validated a measure of individual differences in decision-making competence; *the Decision-Making Competence scale,* abbreviated as *DMC*. The scale uses well-studied tasks from the traditional decision-making literature considered to adhere to different aspects of the decision-making process and to correspond to normative definitions of decision-making skills.

The DMC scale was developed in two studies. In the first study, Parker and Fischhoff (2005) targeted adolescents (all male) within an on-going longitudinal study on adolescents and risk-behavior (the *Youth Decision-Making Competence scale*, *Y-DMC*). They found a correlative relationship between DMC performance and cognitive ability, as well as between DMC performance and indicators of real-life outcomes (i.e., risk-behavior). However, because of limitations in this study (e.g., a restricted and non-randomized sample as well as issues of low reliability scores for some DMC components), Bruine de Bruin et al. (2007) conducted a second study that developed the DMC scale so it could be used with adults (the *Adult Decision-Making Competence scale*; *A-DMC*; henceforth referred to as DMC in this thesis).

The DMC consists of the following six components.1 The component (a) *Resistance to Framing* (RF) measures consistency as observed in two sets of framing tasks: attribute framing tasks and risky-choice framing tasks. Attribute framing tasks consist of positive and negative accounts of seven normatively corresponding events, whereas risky-choice framing

1 The DMC initially included a seventh component – *Path-Independence* – that was intended to measure consistency in choices between gambles. However, this component, which was established as unrelated to the initial six DMC components, did not contribute to the DMC score (Bruine de Bruin et al., 2007). Hence, subsequent research on the DMC has not included this seventh component.

tasks have gain and loss descriptions of decision problems. Both the attribute framing tasks and the risky-choice framing tasks are presented repeatedly by seven descriptions in two frames (positive/negative and sure-thing option/risky-choice option). The component (b) *Applying Decision Rules* (ADR) measures how individuals are able to follow decision rules of various complexities. Participants are asked to apply the preferences of hypothetical consumers by choosing among descriptions of DVD players that differ according to feature ratings. The component (c) *Consistency in Risk Perception* (CRP) measures the ability of assessing probability correctly. Participants assess the probability that ten events will happen to them (no chance 0% - certainty 100%) in two time periods (the next year and the next five years). Correct probability assessments for the next year should not be larger than the probability assessments for the next five years. Additionally, some item pairs nest subsets vs. supersets or compliance probability judgments (e.g., the probability to *get in to a car-accident while driving* and that *your driving will be accident-free*). Responses to these item pairs are scored as correct if their combined probability equals 100%. The component (d) *Under-/Overconfidence* (UOC) measures the ability to recognize the extent of one's knowledge. Participants consecutively judge the correctness (true/false) of 34 statements and, for each statement, evaluate how confident they are of their answer (on a scale from just guessing, 50%, to absolutely certainty, 100%). The component (e) *Resistance to Sunk Costs* (RSC) deals with the ability to ignore prior investments (in terms of costs or efforts). For this component, after reading fictitious scenarios of everyday events, the participants indicate (among two alternatives) how they would deal with the situation. They answer on a scale of 1-6, where 1 represents the sunk cost option and 6 the normatively correct option. The component (f) *Recognizing Social Norms* (RSN) measures the ability to assess social norms. Participants first indicate whether they think "*it is sometimes OK*" to engage in 16 adverse behaviors (e.g., *not returning something that you have borrowed*). Later, participants are asked to estimate how many people ("*out of 100 people your age*") that would approve of each behavior previously assessed. The first assessments, which are converted into a percentage for each behavior (the percentage of participants who approved each behavior), then function as the answer keys for comparisons to subsequent estimations (by rank order correlation).

Bruine de Bruin et al.'s (2007) results demonstrated internal consistency as well as reliability in terms of test-retest (r = .44 -.77, $p < .001$) for individual performance on the DMC

components. They interpreted these results as providing additional support for the assumption that performance on traditional decision-making tasks reflects consistent individual differences. Moreover, and central to the claims in this thesis, the results showed that DMC performance is related to the experiences of real-world decision outcomes (as measured by a self-report scale, the *Decision Outcome Inventory*, DOI; this scale is described and discussed in more detail below). In sum, Bruine de Bruin et al. concluded that the DMC measures specific decision-making skills because DMC performance predicted real-world decision-making outcomes even after controlling for cognitive ability and socio-economic status.

Research on decision-making competence

By expanding the insights provided from the initial research by Parker and Fischhoff (2005) and Bruine de Bruin et al. (2007), subsequent research has demonstrated that individual differences in DMC are related to a number of factors. These include variations in *maximizing* tendencies (Parker, Bruine de Bruin & Fischhoff, 2007), decision-making ability in leaders (Carnevale, Inbar & Lerner, 2011), and cognitive ability, executive functions and numeracy (Del Missier et al., 2012). Furthermore, researchers have found that the DMC has predictive validity for self-reported, real-life behavior in preadolescents (Weller, Levin, Rose & Bossard, 2012; Weller, Moholy, Bossard & Levin, 2014), for domain-specific risk attitudes (Weller, Ceschi & Randolph, 2015), and helps to understand age differences in decision-making ability (Bruine de Bruin, Parker & Fischhoff, 2012; Bruine de Bruin et al., 2014; Strough, Bruine de Bruin & Peters, 2015; Strough et al., 2015). Additionally, research has also reported that decision education can improve decision-making competence (Jacobson et al., 2012). Based on these results, researchers have suggested that DMC research can be the base for recommendations and development of interventions intended to improve people's individuals' decision making (Bruine de Bruin, 2012; Wallin, 2013).

Other tools can also measure aspects of individual decision-making ability (e.g., Cokely, Galesic, Schulz, Ghazal & Garcia-Retamero, 2012; Finucane & Gullion, 2010; Frederick, 2005). However for *general* decision-making ability, a common claim is that the DMC scale has the most promise (e.g., Appelt, Milch, Handgraaf & Weber, 2011; Campitelli & Gobet, 2010).

Decision-Making Styles

In addition to the research on individual differences in decision-making performance (i.e., competence), researchers have also investigated the importance of how people approach decision-making (i.e., variations in decision-making styles) when explaining differences in outcomes and success. Whereas measures of competence (e.g., the DMC) focus on accuracy and consistency in decision-making, measures of style focus on how people usually and preferably approach and handle decision making (based on their self-reports). Decision-making styles are often referred to as a dimension of the more general construct cognitive style (Kozhevnikov, 2007). It has also been noted that the differences between cognitive styles and decision-making styles are not very significant (Riding & Chema, 1994).

In brief, research on decision-making styles is diverse and includes a number of different definitions and measures. Because of these inconsistencies, researchers have called for a more theoretical and systematic understanding of individual differences in styles (Appelt et al., 2011). Heeding this call, researchers have explored the latent structure of decision-making styles (Dewberry, Juanchich & Narendran, 2013b) as well as how styles relates to age and gender (Delaney, Strough, Parker & Bruine de Bruin, 2015). Although such explorations contribute to the understanding of individual differences in styles, more research is needed to fully respond to the needs articulated by Appelt et al.

Measuring decision-making styles

In response to the diversity of definitions and measures related to decision-making styles, Scott and Bruce (1995) developed a measure based on the existing theoretical definitions of decision-making styles: the General Decision-Making Style inventory (GDMS). In developing and assessing their new measure, Scott and Bruce proposed five styles: Rational, Intuitive, Spontaneous, Avoidant and Dependent. These five styles were argued to capture most of the specific characteristics of individual differences in approaching and managing decision making.

People who report a high preference for the *Rational* style rely on extensive information-collection and a pronounced tendency to consider different alternatives when they make decisions. In contrast, people who report a preference for the *Intuitive* style pay attention to specific details, rely on feelings and hunches, and take a trial and error approach in decision making. People who prefer the Spontaneous style tend to make decisions quickly, on the spur

of the moment. More complexity is involved in both the Avoidant and the Dependent styles. People high in the Avoidant style tend to avoid making decisions whereas people high in the Dependent style tend to ask for advice from others and/or even to shift responsibility for decisions to others.

Researchers have frequently used the GDMS and its reliability (Raffaldi, Iannello, Vittani & Antonietti, 2012) as well as validity (Loo, 2000; Curseu & Shruijer, 2012) have been confirmed.

Research on decision-making styles

A vast amount of research reveals that individual differences in decision-making styles affect various aspects of decision success and quality. For example, styles have been related to: decision-making competence **(**Bruine de Bruin et al., 2007); personality (Dewberry et al., 2013a); decision-making success, maximizing tendencies and post-decisional regret (Parker et al., 2007); depression and decisional self-esteem (Leykin & DeRubeis, 2010); stress (Salo & Allwood, 2011; Thunholm, 2008); value orientation (Loo, 2000); real-life decisions (Galotti, 1999); decision conceptualization and goal setting (Galotti, 2006); and evaluations of overall decision quality by self and others (Wood & Highhouse, 2014). In general, the Rational and the Intuitive styles are reported to be the most constructive styles because of their association with more positive outcomes, decision-making efficiency and fewer negative consequences. In contrast, the Avoidant, Dependent, and to some extent also the Spontaneous style, have been reported to be more maladaptive because of their association with adverse behavior and negative outcomes.

Explaining individual differences in decision-making styles

As this summary of the literature shows, it is well-documented that people differ in how they usually and preferably approach decision making. It is also well-documented that these differences affect various aspects of decision-making success and outcome. However, the theoretical understanding of stylistic differences is unclear (e.g., Appelt et al., 2011; Kozhevnikov, 2007). Some researchers argue that stylistic differences can be understood primarily by the amount of information gathered and analyzed (see, e.g., Leonard et al., 1999; Riding, 1997). Other researchers suggest stylistic differences are best understood by attending to analytical (i.e., the Rational style) and intuitive (i.e., the Intuitive style) thinking and

information processing (Pacini & Epstein, 1999). A suggestion related to this dualistic perspective is that stylistic differences can be explained by cognitive preconditions (e.g., working-memory capacity) and preferences by experience (Fletcher, Marks & Hine, 2011).

The GDMS definition of styles is broader. For example, Scott and Bruce (1995) defined decision-making styles as individual differences that cannot be understood simply in terms of analytical thinking (i.e., the Rational style) or of intuitive thinking (i.e., the Intuitive style). Instead, Scott and Bruce acknowledged that people's approach to decision making is more complex (i.e., the Spontaneous, the Avoidant and the Dependent styles are also included).

However, it has been argued that an even more inclusive perspective (see, e.g., Leykin & DeRubeis, 2011; Thunholm, 2004) could (and should) enhance the understanding of individual differences in decision-making styles. In recent research, two approaches for understanding differences in the styles defined by Scott and Bruce (1995) have been presented. Dewberry et al. (2013b) proposed a two-component model of decision-making styles. One component captures cognitive preconditions: *core processes*; (i.e., how information is processed relating to the Rational, Intuitive and Spontaneous styles). The other component captures personality: *regulating processes*: (i.e., when and if decisions are made relating to the Avoidant and Dependent styles). In sum, the model proposed by Dewberry and colleagues suggests that comprehensive definitions and measures of decision-making styles – such as Scott and Bruce's (1995) GDMS – include aspects of decision making that are essentially unrelated. That is, whereas styles that reflect core processes are associated with System 1 or System 2 thinking, styles suggested to attend to regulating processes are associated with fear and anxiety.

Delaney et al. (2015) examined whether styles (analyzed at the item level) form distinct clusters (profiles) and, if so, whether these profiles relate to age and gender. They found that the five styles of the GDMS formed three distinct profiles. The first profile, "affective/experiential", is characterized by reports of making quick and gut-based decisions and a disinclination to seek advice from other people. The second profile, "dependent/interpersonal", is characterized by an inclination to request decisional advice and support from other people. The third profile, "independent/self-controlled", is characterized by a preference for independent and reason-based decisions. Delaney et al. also found that older people were more likely than younger people to be in the independent/self-controlled

profile and less likely than younger people to be in the affective/experiential profile. They observed no relationship between age and the dependent/interpersonal profile. As far as gender differences, they found that women were less likely than men to be in the affective/experiential profile and more likely to be in the dependent/interpersonal profile.

Are decision-making styles related to social orientation and time-approach?

The descriptions of decision-making styles, proposed by Dewberry et al. (2013b) and Delaney et al. (2015), are indeed useful in understanding how people make decisions. However, because decisions are often made in continuous, dynamic and complex social settings (e.g., Frith & Singer, 2008; Rilling & Sanfey, 2011), it is also useful to explore how styles relate to individuals' functioning in everyday life. In line with this, Leykin and DeRubeis (2010), in suggesting that differences in styles can be perceived as adaptive expressions of decision-making deficiencies, recommended that "…the role that individual characteristics play in influencing decision-making styles…" should be investigated (p. 511). Wood and Highhouse (2014) also proposed that research on individual differences in decision-making styles would benefit if more attention were paid to accountability aspects/concerns. In sum, because the literature on how styles relate to individuals' orientation and functioning in everyday life, including work life, is limited, more research in the area is needed.

Some researchers have reported a relationship between decision-making styles and aspects of social orientation (e.g., Di Fabio & Kenny, 2012; Di Fabio & Palazzeschi, 2009) and aspects of time orientation (Carelli, Wiberg & Wiberg, 2011). Nevertheless, this research have either been selective or not had these relationships as its primary concern. Therefore, a more detailed exploration of these relationships is needed. In addition, researchers have not explored how social orientation and time-approach influence decision-making styles inclusively. Research in these areas could improve the theoretical understanding of decision-making styles (Appelt et al., 2011). Study 3 in this thesis addresses these areas.

Decision Quality

It might be expected, given the diversity of decision-making research, that normative standards would have received less attention or at least less estimated importance. But this is not the case. In contrast, normative standards are generally considered essential in decision-making science as a point of reference to account for the quality of decisions (i.e., *normative*

decision analysis) or for the purpose of explaining how decisions are made (i.e., *descriptive decision analysis*). Hence, normative standards are often equated with good decisions (Baron, 2012).

However, the correctness and relevance, of attending to normative standards when evaluating decision quality have not gone unchallenged. For example, researchers question whether it is appropriate to make quality assessments by normative models and whether the standards these models promote (e.g., internal consistency in decision making) really equate with good decision making. This critique derives from the idea that normative standards tend to be overtly focused on the decision outcome, thereby neglecting the fact that decisions are often associated with uncertainty and that positive outcomes can be given by chance. As a result, researchers propose that evaluations of decision quality are more adequately approached by a focus on the decision process (Frisch & Clemen, 1994). To illustrate, a focus on the decision process attends to how people generate options and how they evaluate possible consequences. Such a focus expands the definitions of utility in terms of convenience (Bettman et al., 1998) and/or in terms of appropriateness (March, 1991).

Some researchers even argue that decision-making science focuses too narrowly on how decisions conform to standards of rationality and neglects how decision making best relates to practical rationality (referred to as substantive rationality by Keys and Schwartz, 2007). In making their argument, Keys and Schwartz suggested that the effects of the psychological processes leading to "irrational" decisions (i.e., heuristics and biases) sometimes influence the experience of the decision. Indeed, it has been reported that experiences or evaluations of biases (e.g. framing effects) are difficult to ignore or correct in hindsight (Frisch, 1993). Thus, changes in the description of choice alternatives should not be ignored if they influence decision-makers' experiences.

Consequently, Keys and Schwartz (2007) emphasized that *subjective* consequences should be the standards for evaluating decisions (rather than *objective* consequences). Moreover, Keys and Schwartz proposed that such evaluations can be assessed by exploring how consequences of decisions are experienced as well as by how decision-processes conform with decision-makers' life as a whole. Stanovich (2013), who addressed this idea, argued that people violate the axioms of rational choice because of contextual complexity (e.g., shifting information makes adherence to the consistency-requirement difficult), symbolic complexity (e.g., choices

can have different symbolic value or meaning for different decision-makers or in different social settings), and the so called strong evaluator struggle (e.g., in reflecting on a preference/desire, people may choose a higher-level preference).

Schwartz, Ben-Haim and Dacso (2010) proposed that, due to the fundamental uncertainty in which many real-life decisions are made, the best decision strategy does not aim to maximize utility but rather to maximize satisfaction (or, on average, a strategy most likely to be *satisficing*). The benefit of satisficing compared to maximizing has been observed in different contexts (Jain, Bearden & Filipovic, 2013; Schwartz et al., 2002). It has also been demonstrated that maximizers are generally less happy (less satisfied) with outcomes compared to satisficers because they maximize both positive and negative outcomes (Polman, 2010). Related to this, Sims, Neth, Jacobs and Gray (2013) suggested that melioration (i.e., choosing a local and lesser gain instead of a distant and greater gain) may be an optimal response strategy that maximizes long-term gains in complex and uncertain settings.

The dominant tendency in decision-making science to describe people as *intuitive scientists* (e.g., strive for causal understanding) or as *economists* (e.g., determined to maximize utility) has also been questioned. Tetlock (2002) challenged this description with the claim that it would be advantageous and more useful to shift, or complement, the focus by emphasizing the social functions of decisions. The accountability approach to decision making offers this focus, as well as an alternative assessment of decision quality. Although this approach is described in more detail below, here it is sufficient to remark that the accountability approach claims that good decisions are those that can be accounted for. That is, quality is evaluated by the extent that decisions are considered to be reasonably and acceptably justified by oneself and/or by people in the social context (Lerner & Tetlock, 1999; Tetlock, 1985).

More in general, it has been argued that good decision-making processes often leads to good decisions (Keren & Bruine de Bruin, 2003; Yates, Veinott & Patalano, 2003). However, as some researchers have observed (e.g., Frisch & Clemen, 1994), this relationship is not absolute. The basic assumption is also problematic because good decision-making processes may result in poor decisions (and outcomes), and poor decision-making processes may result in good decisions (and outcomes). Furthermore, in order to evaluate the relationship between good decision-making processes and good decisions (outcomes), independent criteria for the latter must be specified.

It is relevant in this discussion to consider how people actually evaluate decision quality. Some research concludes that people often stress the outcomes and consequences of decisions as the best indicator of quality (Yates et al., 2003). Yet other research reports that people also evaluate how these outcomes and consequences are reached (e.g. Ritov & Baron, 1990). This point of view implies that the process, and not the outcome, may best indicate the quality of a decision (Baron, 1994; Frisch & Clemen, 1994). In addition, research reports that people sometimes evaluate ("unnecessarily") precautious decisions as better than the consequentially right alternative (Dekay, Patiño-Echeverri & Fishbeck, 2009).

In general agreement with Keys and Schwartz (2007) and Schwartz et al. (2010), other researchers propose that the quality of real-life decisions cannot be adequately evaluated without relating these to the decision-maker's personal goals and standards (Weiss & Weiss, 2012). Commenting on personal goals, Higgins (2000) noted that decisions may sometimes be incorrectly evaluated as unsuccessful (e.g., failed to achieve a positive outcome) because objective evaluations may not consider the decision-maker's intention (e.g., motivated to avoid a negative outcome). It is also possible that negative decision outcomes should sometimes be evaluated as successful. For instance, in situations where decision-makers only have the possibility to choose between alternatives associated with negative outcomes, a negative outcome should, generally speaking, be evaluated as successful if it minimizes negativity (Parker, Bruine de Bruin & Fischhoff, 2015). In sum, as this brief and selective review illustrates, the issue of decision quality is neither easily settled, nor a topic in consensus.

Decision quality in everyday life

The relevance and predictive validity of the DMC to real-life decision outcomes is repeatedly referred to within the research-literature on decision-making competence (see, e.g., Bruine de Bruin, 2012; Campitelli & Gobet, 2010; Carnevale et al., 2011; Del Missier et al., 2012; Fischhoff, 2010; Jacobson et al., 2012; Mäntylä, Still, Gullberg & Del Missier, 2012; Weaver & Stewart, 2012; Weller, Levin, Rose & Bossard, 2012; Weller, Moholy, Bossard & Levin, 2014). The position taken in this thesis is that this claim needs to be more adequately defined.

Bruine de Bruin et al. (2007), in addition to developing the DMC, also developed a self-report measure for real-life decision outcomes which was used in order to validate the DMC: the *Decision Outcome Inventory* (DOI). This self-report measure is intended to identify individual

differences in the success/quality of real-life decision making by terms of having been able to avoid negative outcomes. While other measures of decision-making success used in DMC research are more domain specific (e.g., risk-taking or school performance; Parker & Weller, 2015; Weller et al., 2012), the DOI is the foremost measure on which the reference to DMC's predictive validity for overall real-life decision-making success is based. Although the validity of the DOI has been investigated in recent research, for example demonstrating that lower DOI-scores (i.e., more negative outcomes) are more common among younger people and among people of lower socio-economic status (Parker et al., 2015) and may be a relevant measure to consider in relation to clinical depression and suicidal ideation (Bruine de Bruin, Dombrovski, Parker & Szanto, 2015), it is still unclear how high or low DOI scores relate to other indicators of real-life decision-making success (e.g., subjective experiences).

The Decision Outcome Inventory

The DOI mostly consists of a collection of item-pairs in which the first question asks whether or not (in the last ten years, cf. Bruine de Bruin et al., 2015) individuals have made decisions that make subsequent negative outcomes possible. For example, *gone shopping for food or groceries*, followed by, *threw out food or groceries you had bought because they went bad*: *been married* followed by *been divorced*, etc. In total, the DOI consists of 41 decision outcomes with 34 item-pairs (some pairs consist of more than one possible negative outcome) and some single items (i.e., items without a preceding screening questions, such as *declared bankruptcy* and *been diagnosed with Type 2 diabetes*) encompassing different domains of real-life decision making. The domains include economy, health, and indicators of risky (or socially deviant) behavior.

The total DOI score is calculated by weighting each report of a negative decision outcome by the proportion of participants reporting to not have experienced this negative outcome (e.g., *been divorced*), although they had the possibility (e.g., *been married*). Thus, the total DOI-score is based on the assumption that less frequent negative decision outcomes are more severe than the more frequent ones – in the specific group studied (cf. Parker et al., 2015).

The DOI undoubtedly measures some aspects of real-life decision-making success. However, because people's real-life decisions are often made in conditions of uncertainty and complexity, the appropriateness of only attending to objective and normative standards could be questioned. For example, it may be argued that some items of the DOI deal with human

experiences out-of-context. To illustrate, if a person has had a credit card and has had more than $5000 in credit card debt (an item pair/negative outcome in the DOI), it is not necessarily implied that the decision to get into this debt should be regarded as a negative outcome. Context matters. For some people, $5000 may or may not be a large amount for a person, or the debt could have been a good decision as it minimized negativity (e.g., an urgent need for a new roof to one's house) or maximized positivity (e.g., a sudden opportunity for a memorable vacation with loved ones) in other domains of a person's life.

Moreover, certain items on the DOI could be considered to comprehend outcomes that are to some extent given by chance (e.g., *missed a flight*, *had the key to your home replaced because you lost it,* or *broken a bone because you fell, slipped or misstepped*). Perhaps it is such limitations that have resulted in the limited further use of the DOI in research. This limited use is noteworthy, since an adequate measure for real-life decision-making outcome most probably would have been much used within decision-making research. Nevertheless, except for the research described above, the DOI (in a somewhat amended version) has been used only in research that explores the benefits of critical thinking (Butler, 2012; Butler et al., 2012) or as a measure of competence, not outcomes (Dewberry et al., 2013a).

Indicators of subjective decision quality in everyday life

Given the difficulty of measuring decision quality, it may be beneficial to take a multifaceted approach to its analysis. Due to the complexity of the issue, such an approach has been proposed by previous researchers (Yates et al., 2003). Yet other researchers have suggested that, in the context of real-life, approaching and evaluating everyday decision quality is probably most adequately done in terms of accountability (Keren & Bruine de Bruin, 2003). That is, in the social complexity of real-life, being able to make decisions that are supported, approved and positively evaluated by other people, is a useful criterion for evaluating decision quality. Importantly, the accountability approach to decision making does not only assume that decision-makers should be able to justify their decisions to others but also to themselves. Milkman, Chugh and Bazerman (2009) commented on the relevance and importance of decision-makers' personal satisfaction (i.e., accountability) with their decisions and the reasonable assumption that such evaluations are the same whether they concern one's own or other people's decisions.

However, the accountability approach does not provide a specific or direct measure of real-life decision quality. Instead, indicators for such quality must be inferred. The basic assumption of the accountability approach focuses on the social contingency of decision making in terms of the interaction between subjective experiences and social dependencies (i.e., that decision-makers can justify their decisions if held accountable; Tetlock, 1985). Hence, a reasonable approach to measuring decision quality is to examine decision outcomes in variables that are influenced by this interaction. In the next sections such variables are proposed.

Experiencing minor difficulties in life: "daily hassles"

Bruine de Bruin et al. (2007) proposed that experiencing everyday difficulties is one possible consequence for people with lower decision-making capabilities. Consequently, measuring to what extent people experience difficulties in various domains (e.g., social, work-related and/or financial difficulties) of their daily lives (Kohn & McDonald, 1992) can be seen to reflect their ability to make effective decisions. For example, the assumption is that being able to perform good and accountable decision-making processes results in fewer questions and/or less criticism from others (i.e., social difficulties), fewer misunderstandings and/or conflicts with supervisors or colleagues (i.e., work difficulties), and fewer problems in personal economy (i.e., financial difficulties).

Although this measure of people's self-reported everyday difficulties may resemble the design of the DOI, it nevertheless broadens the definition of decision quality because of its emphasis on the successful implementation of everyday decision-making processes. Indeed, the design of the DOI was patterned after life event scales, assessing self-report of life stress in terms of experiences of negative events (Parker et al., 2015). However, and importantly, self-reports of everyday difficulties reflect decision-makers' subjective experiences and thereby differ from the design of the DOI. The Survey of Recent Life Experiences (Kohn & MacDonald, 1992) measures reports of daily hassles in various domains of life and was used in the present thesis (Study 1) as an indicator of real-life decision-making outcomes.

Satisfaction with life

Another measure of real-life decision-making quality is reported satisfaction with life. This offers a potential way to assess how individuals evaluate their general decision-making

success by use of their own subjective criteria. Subjective well-being is based on cognitive assessments in which one's perceived circumstances are compared to personal and self-imposed standards (Pavot & Diener, 1993). Therefore, reports of subjective well-being capture some fundamental aspects of how decisions conform with personal goals and standards (Higgins, 2000; Keys & Schwartz, 2007; Weiss & Weiss, 2012).

Furthermore, beyond the usefulness of adhering to different validation criteria for decision quality, it is also important to include subjective well-being in order to explore if the motive for developing interventions designed to improve peoples' decision-making could be even more strengthen by a relationship between decision-making competence and overall satisfaction and quality of life (see, e.g., Bruine de Bruin et al., 2015; Wallin, 2013). In addition, measures of satisfaction with life specifically ask to what extent their life, at the current stage, is to their satisfaction or whether or not they, in hind-sight, would have done things differently (Diener, Emmons, Larsen & Griffin, 1985). Hence, satisfaction with life reflects subjective evaluations that are largely in inverse relation to the subjective evaluations captured by measures of regret that are frequently used to indicate success and/or quality in decision-making research (e.g., Inbar, Botti & Hanko, 2011; Kirkeboen, Vasaasen & Teigen, 2013; Schwartz et al., 2002).

However, because multiple factors influence subjective well-being and because personal standards of success differ from one person to another, one proposal is that satisfaction should be measured globally (Diener et al., 1985). That is, since the domains of these evaluations are not defined in advance but opens for subjective inference, global measures of satisfaction with life respond to personal evaluations of general goal-fulfillment in life, or the with the extent to which people regret past experiences, etc. For example, Hultell and Gustavsson (2008) proposed that age-differences in reports of satisfaction with life might reflect experiences with critical decisions and subjective reflections on their consequences. In this thesis, Study 1 uses the Satisfaction With Life Scale (Diener et al., 1985) that measures subjective well-being and general satisfaction with life as an indicator of real-life decision-making outcomes.

Stress

Another way to evaluate decision quality is to attend to measures of perceived stress. As the everyday is filled with both numerous and hard decisions, ability to make good decisions can be expected to decrease and protect against stress. The effects of stress on decision making

have been previously investigated. For example, research shows that people who are more sensitive to stress perform more poorly on decision-making tasks (Baradell & Klein, 1993). However, some researchers have highlighted that stress and decision making are intricately related, as stress influences decision making, and many decisions induce stress (Starcke & Brand, 2012). In brief, perceived stress may be used to indicate real-life decision-making outcome.

Yet there is a scarcity of research that explores the reverse relationship (i.e., how decision-making performance affects stress). Nevertheless, supportive of such a reverse relationship, recent research has reported results suggesting that decision-making ability can be a potential coping-resource against stress (Santos-Ruiz et al., 2012). Furthermore, stress is per definition a response that occurs when environmental demands exceed a person's regulatory capacity (see, e.g., Koolhaus et al., 2011). As this thesis emphasizes, making (good) decisions is a requirement in daily life, both personally and professionally. Thus, people's decision-making ability (i.e., competence) may (or perhaps even should) be an important component of their regulatory capacity (see, e.g., Loewenstein, 2001; Weller et al., 2014).

Additionally, stress is not only a fast or immediate response to a specific stressor but can also evolve as a result of complex cognitive evaluations of situations and possible consequences (Ursin & Eriksen, 2010). Consequently, a person's decision-making competence may influence these evaluations. In sum, individual differences in the ability to handle everyday decision making are likely to contribute to psychological stress. In this thesis, Study 2 uses the Perceived Stress Questionnaire (Levenstein et al., 1993) to measure perceived stress as an indicator of real-life decision-making outcomes.

Expanding the criteria of everyday decision quality

Although multiple factors undoubtedly contribute to the variances in the different outcome measures described above, it could still be argued that overall efficient and successful decision-processes provide substantial explanations of these variances. Furthermore, being able to carry out decision processes in accordance with the demands in social settings may increase the chances for (successful) implementation of the decision (Allwood & Hedelin, 2005). Additionally, an advantage of measuring decision quality with the outcome measures described above is that they constitute well-studied constructs. Finally, exploring the predictive validity of decision-making competence with different outcomes measures is

important in order to motivate interventions and recommendations aimed at improving people's decision-making in both personal and professional settings. Therefore, expansion of the criteria used to evaluate real-life decision-making success to include daily hassles, well-being and stress has clear merits.

Expanding the concept of decision-making competence

By investigating the relationship between decision-making competence (i.e., the DMC) and the outcome variables described above, it is possible to further test the external validity of the DMC. Moreover, investigating the relationship between the previous outcome measure (i.e., the DOI) and the outcome variables described above, also offers an opportunity to explore how objective and normative definitions of decision quality relate to subjective experiences (e.g., Keys & Schwartz, 2007).

This thesis assumes that cognitive abilities contribute to, or are necessary for, real-life decision-making success. One example is the ability to attend to and be able to process relevant decision information correctly. These basic cognitive capabilities are measured by the existing definition of decision-making competence (i.e., by the DMC). However, many real-life decisions are made in complex social settings. In these everyday settings, decision-making processes and final decisions often require to be appropriately fitted to the specific context. This implies that basic cognitive capabilities may not suffice. In this thesis it is assumed that, in the everyday and working life, people also require both a broader range of social competence *and* an appropriate approach to time in order to be competent decision-makers.

Although the DMC, to some extent, aspires to encompass the social aspects of decision making, in particular by the component *recognizing social norms*, it does not fully deal with the social dimension of real-life decision making. In fact, research has reported that social dimensions of the decision and individuals' approach to time can affect performance on tasks (i.e., *resistance to sunk costs*) measured by the DMC (Hafenbrack, Kinias & Barsade, 2013; Strough, Schlosnagle, Karns, Lemaster & Pichayayothin, 2014).

This thesis does not claim there is a social/time dimension to *all* everyday decisions. Rather, the claim is there is a social/time dimension to *most* everyday decisions. Hence, the studies reported and discussed in the present thesis are based on the assumption that peoples' overall decision-making competence and approach to decision making depend on decision-related

aspects of social skills/orientation and time-approach. The measures used in the studies of this thesis were selected because they recognize such differences.

Decision making and social skills/competence

Previous research has acknowledged the social nature of real-life decision making (e.g., Sanfey, 2007; Tetlock, 1985, 2002). Research has also observed that everyday decision making sometimes involves a conflict between reason and emotion (Frith & Singer, 2008). This conflict is evident by the fact that many decisions require delay of gratification and/or emotion regulation in order to be successful (Rilling & Sanfey, 2011). In sum, certain aspects of social competence are fundamental if people are to make efficient and successful real-life decisions. Although many aspects of social competence likely contribute to effective everyday decision making, this thesis focus on: self-awareness, social character and emotional intelligence. The next sections explain the reason for selection of these aspects.

Self-awareness

One aspect that can be expected to aid decision making in social settings is the ability to recognize social cues and be able to adapt ones' behavior and self-presentation accordingly. The social psychological phenomenon *self-monitoring* targets these abilities (Gangestad & Snyder, 2000; Lennox & Wolfe, 1984; Snyder, 1974). Numerous studies have demonstrated the general benefits associated with self-monitoring. For example, self-monitoring has been related to individual differences in job performance and promotions (Day, Schleicher, Unckless & Hiller, 2002) and how and if a person can accurately, profitably and strategically recognize and handle social-exchange relations (Flynn, Reagan, Amantullah & Ames, 2006). These reports suggest that the aspects of social orientation comprehended by self-monitoring, help people to perform successful decision-making processes in social settings for example by acknowledging and responding to accountability demands. Therefore, it seems reasonable to include individual differences in self-monitoring when studying what factors contribute to real-life decision-making success.

Social character

Another aspect relevant to consider in real-life decision making is social character. For example, the extent to which one trust and is sincere towards others and the extent to which one ruthlessly strives for status and is ready to stray from moral standards in order to achieve

personal benefits Individual differences in these propensities are comprehended by *Machiavellian Personality* (Christie & Geis, 1970; Dahling, Whitaker & Levy, 2009). Research has demonstrated that the manipulative and amoral tendencies associated with Machiavellianism relate to counterproductive work behavior, poorer task performance and more egoistic decision making. Campbell, Hoffman, Campbell and Marchisio (2011) also demonstrated that the antagonistic behavior captured by Machiavellianism negatively affects the health and well-being of people (colleagues) in their work environments. Additionally, it has been reported that the Machiavellian personality construct is related to such adverse traits of narcissism, and sub-clinical psychopathy – together constituting the so called dark triad of personality (Paulhaus & Williams, 2002).

Given this research, it is reasonable to assume, at least in the long run, that higher degrees of Machiavellianism personality are associated with reduced efficiency and less success in socially complex, everyday decision making. However, it should be noted that other research argues that a certain degree of Machiavellianism can be beneficial (e.g., distrust of others may prevent naïve credulity; Whiten & Byrne, 1997).

Emotional intelligence

As made evident by previous research (Bechara & Damasio, 2005; Slovic et al., 2002), emotions influence decision making. Yet, the role of emotion as beneficial or problematic has been debated (e.g., Peters, Västfjäll, Gärling & Slovic, 2006). Additionally, because emotions (affect) can be defined in terms of state or trait, the measurement of individual differences in emotion-influence on decision making might seem problematic. However, one way to approach this can be by investigating individual differences in emotional intelligence (Petrides & Furnham, 2001).

The research on emotional intelligence [EI] is diverse with numerous measures used to explore individual differences by self-reports (*trait*-EI) or by maximum-performance (*ability*-EI). Measures of trait-EI cover the subjective nature of emotions in terms of experiences, dispositions and self-perceptions. By contrast, measures of ability-EI covers knowledge about emotions and is more strongly related to cognitive ability (Perez, Petrides & Furnham, 2005). Evidently, the usefulness of trait-EI and/or ability-EI depends on what component of EI that is of interest. However, it has been noted that self-report measures of trait-EI that combine direct questions (e.g., self-rated emotion-regulation ability) with indirect questions (e.g.,

relationships with others/success in dealing with others) are beneficial and reasonably capture core aspects of EI (Spector & Johnson, 2006). Furthermore, as the benefits of trait-EI for social decision-making seems to be given by enhanced processing of emotional information in System 1 (Telle et al., 2011), trait-EI may relate to emotion regulation in terms of reappraisal (Gross, 2002).

Furthermore, researchers have related trait-EI to peer-rated social competence (Mavroveli, Petrides, Rieffe & Bakker, 2007), coping with stress (Mikolajczak & Luminet, 2008), decision-making styles (Di Fabio & Kenny, 2012), and decision-making success in social contexts (Mikolajczak, Balon, Ruosi & Kotsou, 2012; Telle et al., 2011). It has also been suggested that trait-EI is particularly appropriate for the measurement of general aspects of decision-related emotional disposition and emotion regulation (Sevdalis, Petrides & Harvey, 2007).

Time and decision making

Time is an important dimension in the study of people's decision making (Loewenstein et al., 2003). For example, Wittmann and Paulus (2007) showed that the way in which time is perceived and approached affects how individuals make decisions and evaluate their outcomes.

The impact of time on people's decisions has often been examined in terms of the delay of gratification (i.e., sacrificing short-term happiness in favor of long-term well-being; Stratham et al., 1994). Explorations and explanations of people's preference for immediate utility over delayed utility are central in the research on inter-temporal discounting (Frederick, Loewenstein & O'Donoghue, 2002). For obvious reasons, these preferences relate to self-control (Baumeister, Schmeichel & Vohs, 2007; Joireman, Balliet, Sprott, Spangenberg & Schultz, 2008). Individual differences in how time is perceived and approached are, of course, also related to how time is managed. Such differences affect people's temporal focus (i.e., present, past or future), their prioritizing, structuring and planning (i.e., more or less appropriate and effective), and their experience of time duration (i.e., how much time is dedicated to certain tasks; Claessens et al., 2007).

Time-approach

The research literature has demonstrated that people's time-approach influences their decision making (Usunier & Valette-Florence, 2007; Zimbardo & Boyd, 1999). Conclusions in this research are that individual differences in time-approach relate to how people approach decisions (Carelli et al., 2011) and affect consumer-decisions (Usunier & Valette-Florence, 2007). Researchers have defined individual differences in time-approach in various ways: a focus on impulsiveness vs. future considerations (Stratham et al., 1994), a somewhat existential perception (Zimbardo & Boyd, 1999), or a more direct and differentiated conception (Usunier & Valette-Florence, 2007). Although some differences in terminology exist between these approaches, it has been proposed that different definitions are largely interchangeable (Drake, Duncan, Sutherland, Abernethy, & Henry, 2008).

Procrastination

As previous research has concluded, time-approach is an important factor in the study of peoples' real-life decision making. Additionally, a specific aspect of time-approach is the tendency to procrastinate, that is, to postpone the commencement or completion of necessary tasks (Lay, 1986). Procrastination has been explained in numerous ways (Steel, 2007). Although procrastinating behavior is related to short-term benefits, research concludes procrastination leads to lower task-performances and to long-term costs (Tice & Baumeister, 1997). Both time-approach and procrastination are important in personnel selection, as approach to time guides people's judgments and decisions in both personal and professional settings (Gupta, Hershey & Gaur, 2012). Hence, the three studies reported in this thesis examine this conclusion by investigating the effects of time-approach and procrastination behavior.

In sum, research points to a complex relationship between decision making, aspects of social skills/competence and time-approach. This thesis explores this relationship in two ways. First, it investigates if, and to what extent, the existing concept of decision-making competence would be improved by including aspects of social skills/competence and time-approach. Second, it explores if investigating the relations between individual differences in social skills/orientation and time-approach and decision-making styles can advance the understanding for variations in decision-making styles (Study 3).

Summary of the Studies

Study 1

Aim. Study 1 included three sub-studies: Study 1.1, Study 1.2, and Study 1.3, targeting different samples; a community population, police investigators and social workers. The first aim was to explore how an objective, normatively defined, measure of real-life decision-making outcome/success relates to other, subjective defined, indicators of real-life decision-making outcome/success. The second aim was to investigate if the predictive power of the DMC would replicate when other criteria (i.e., subjective indicators) are used. The third aim was to explore if, and to what extent, individual differences in social skills/competence and time-approach add to the statistical explanation of real-life decision-outcomes beyond the explanation provided by the more cognitive capabilities that the DMC measures.

Method. In Study 1.1, 175 participants – generally representative of the Swedish community population – completed a web-based questionnaire managed by an on-line survey company. The questionnaire included the following scales: the *Decision Outcome Inventory* (DOI) that measures individual differences of having been able to avoid negative outcomes associated with real-life decision making in the last ten years; the *Satisfaction With Life Scale* (SWLS) that measures general satisfaction with and overall goal-fulfillment in life; and the *Survey of Recent Life Experiences* (SRLE) that assesses the extent of people's experience with daily hassles in the most recent month.

In Study 1.2, 90 Swedish police investigators (37 % women, mean age = 46 years) completed a questionnaire presented to them in web page format or in paper-and-pen format. These participants were representative of professionals who face complex situations where good decisions are an everyday necessity. The questionnaire included the following scales: the *Adult Decision-Making Competence scale* (DMC) that measures individual differences in performance on traditional decision-making tasks; the *Self-Monitoring Scale* (SMS) that includes both individual differences in the ability to tune into the social environment and in the ability to adapt behavior according to changing demands; the *Trait Emotional Intelligence Questionnaire – Short Form* (TEIQue-SF) that assesses individual differences in the ability to understand one's own and others' emotional reactions as well as aspects of the ability to regulate emotions effectively; the *Time-Style Scale* (TSS) that assesses individual differences of preference in approach to, or tendencies toward, time; the *Procrastination Scale* (PS) that

measures individual differences in the tendency to postpone the commencement and completion of tasks. Additionally, as dependent variables (i.e., measures of real-life decision-making outcomes) the questionnaire also included the following measures: the *Satisfaction With Life Scale* (SWLS) that measures subjective evaluations of general goal-fulfillment in, and satisfaction with, life (at the current stage); and the *Survey of Recent Life Experience* (SRLE) that measures individual differences in experiences of minor difficulties and hassles in everyday contexts (in the most recent three months).

In Study 1.3, 118 social workers (85% women, mean age = 43 years) completed a web questionnaire. Study 1.3 used the same material as Study 1.2 but also included the *Decision Outcome Inventory* (DOI). However, to be suitable for the professional sample, some amendments to the DOI were necessary. Hence, six items/outcomes in the DOI about infidelity, diagnosis of sexually transmitted diseases, unplanned pregnancy, condom use, drunk driving and overnight jail incarceration (for any reason) were excluded.

Results. Study 1.1 showed that scores on the objective measure of real-life decision-making success (i.e., the DOI) were negatively related to the subjective indicator of real-life decision-making outcomes as measured by reports of daily hassles (i.e., the SRLE). However, no significant relationship was observed between the DOI and reports of general goal-fulfillment in, and satisfaction with, life (i.e., SWLS). Furthermore, reports of daily hassles (SRLE) were related to reports of satisfaction with life (SWLS).

Study 1.2 showed that the skills/competence measured by the DMC did not significantly explain the variances in subjective real-life decision-making outcomes (i.e., experiences of *daily hassles* and *satisfaction with life*). However, Study 1.2 provided evidence that decision-related aspects of social skills/competence and time-approach have predictive validity for the targeted criterion variables in addition to the (non-significant) explanation by the DMC. Individual differences in *social skills/competence* explained 32% of the variance for *satisfaction with life*, and 19% of the variance for *daily hassles*. Furthermore, Study 1.2 showed that measures of *time-approach* explained 38% of the variance in satisfaction with life and 16% of the variance in the experiences of daily hassles.

Study 1.3 replicated the main results from Study 1.2 and expanded the insights of Study 1.1. In Study 1.3 a significant positive relation was observed between general goal-fulfillment in, and satisfaction with, life (i.e., the SWLS) and reports of being able to avoid negative

outcomes associated with real-life decision making (i.e., the DOI). Furthermore, the skills measured by the DMC did not significant explain the variance in subjective or objective real-life decision-making outcomes. However, Study 1.3 replicated Study 1.2's predictive validation of decision-making competencies in terms of social skills/competence and time-approach to both subjective and objective real-life decision outcomes. In Study 1.3, *social skills/competence* explained 27% of the variance in *satisfaction with life,* 30% of the variance in *experiencing daily hassles*, and 17% of the variance in *reports of being able to avoid negative outcomes associated with real-life decision making* (i.e., the DOI). Moreover, measures of *time-approach* explained 28% of the variance in *satisfaction with life*, 40% of the variance in *experiencing daily hassles,* and 24% of the variance in *reports of being able to avoid negative outcomes associated with real-life decision making*.

Discussion. The results from the three sub-studies in Study 1 show that an objective, normatively defined, indicator of real-life decision-making success (i.e., the DOI) relates to subjective, experience-based definitions (i.e., as measured by the SRLE and the SWLS). However, more specifically, *experiencing daily hassles* (SRLE) and *reports of being able to avoid negative outcomes associated with real-life decision making* (DOI) showed to be (negatively) related in both the community population sample (Study 1.1) and the professional sample (Study 1.3). In contrast, a (positive) relationship between *general goal-fulfillment in, and satisfaction with life* (SWLS) and *reports of being able to avoid negative decision-making outcomes* (DOI) was only observed in the sample of professionals (Study 1.3), not in the community population sample (Study 1.1). One possible explanation for this difference in observed relationship is that the scores for *reports of being able to avoid negative outcomes associated with real-life decision making* (DOI) are sample-specific. That is, the DOI scores are calculated by weighting reports of having experienced negative outcomes by the proportion of participants - in the studied sample - who report not having experienced this negative outcome (e.g., *been divorced*), although having had the possibility (e.g., *been married*).

Furthermore, the results of Study 1.2 and Study 1.3 show that the skills measured by the DMC did not have predictive validity for subjective indicators of real-life decision-making success/outcomes (i.e., SRLE and SWLS). Considering the observed relationships between the different outcome measures in Study 1.1, these results are somewhat surprising. In

addition, the finding that the predictive validity of the DMC was not replicated in relation to the criterion variable used in previous research (i.e., the DOI) is especially noteworthy.

In general, the results of Study 1.2 and Study 1.3 clearly support the idea that individual differences in decision-making competence would benefit by including aspects of social skills/competence and time-approach. Considering social skills/competence, trait-EI was identified as the predictor that explained most of the variance in all outcomes measures used in Study 1.2 and Study 1.3. The skills/competence measured by trait-EI contributed to positive outcomes consistently. The results are a bit more complex for the measure of self-awareness (i.e., the self-monitoring scale). Higher degrees of self-monitoring in terms of ability to modify one's behavior to shifting demands contributed significantly to the explanation of experiencing daily hassles and reports of having been able to avoid negative outcomes associated with decision making (Study 1.3.). However, the contribution of this ability was negative, that is, related to more/higher reports of daily hassles and to a lower ability to avoid negative decision-making outcomes. Moreover, the other aspect of self-monitoring (i.e., being sensitive to the expressive behavior of others) provided a nearly significant explanation (positive direction, that is, with fewer/lower reports) of experiences of daily hassles (Study 1.2).

Furthermore, the results of Study 1 show that individual differences in time-approach are important for understanding the variance in real-life decision-making success. Overall, the results indicate that it is more important not to have an explicitly negative approach to time (e.g., anxious time-style) than it is favorable to have a positive approach to time (e.g., economic and/or submissive time-style).

Some differences were observed between the samples with regard to the contribution provided by social skills/competence and time-approach. Comparing the professional samples in Study 1.2 and Study 1.3, social skills/competence contributed considerably more to explaining the experience of daily hassles among social workers (Study 1.3.) than among police investigators (Study 1.2.). At the same time, time-approach contributed more to explaining the experience of daily hassles among police investigators than among social workers. These results are reasonable as the social dimension of social workers' decision making may be more pronounced compared to that of police investigators. Also, aspects of time may be more crucial in crime investigations than in social service cases. In sum, the

results of Study 1.2 and Study 1.3 illustrate that individual differences in social skills/competence and time-approach are important aspects of a broader definition of everyday decision-making competence, although this importance can differ depending on the specific sample and decision context targeted.

Study 2

Aim. Study 2 investigated the predictive power of DMC, social skills/competence and time-approach for the outcome measure of *perceived stress*. More specifically, in addition to exploring the contribution of DMC, Study 2 investigated if supplementary aspects of competence in terms of; *social skills/competence* and *time-approach* add to the statistical explanation of experienced levels of *perceived stress*. Study 2 also investigated whether the benefits associated with decision-making competence (i.e., measured by the DMC), as reported in previous research, could transfer to the stress-domain. This investigation of relation was based on recognizing the fact that explorations of how decision-making ability affect levels of stress are largely absent within the decision-making literature (Starcke & Brand, 2012) yet is reasonable and has been suggested (Santos-Ruiz et al., 2012). Specifically, stress is defined as a reaction that occurs when perceived demands exceed the perceived regulating resources (Koolhaus, 2011), and this reaction can be activated by cognitive evaluations of situations and possible consequences (Ursin & Eriksen, 2010). Therefore, decision-making competence could (or even should) be expected to have a stress-preventive/coping function. Additionally, experienced levels of stress reflect one (subjective) aspect of real-life decision-making outcome.

Method. Study 2 included two sub-studies: the sample in study Study 2.1 consisted of university students (N=118), and the sample in Study 2.2 consisted of police investigators (N=90). The professional sample of police investigators was the same as in Study 1.2. Data for Study 2.1 and Study 2.2 were collected using web-based questionnaires (Study 2.1 and Study 2.2); data for Study 2.2 were also collected using a paper-and-pen questionnaire. The questionnaire consisted of scales and self-reports that measures: *cognitively oriented decision-making skills* (i.e., the Adult Decision-Making Competence scale: DMC), *social skills/competence* (Self-Monitoring Scale: SMS – Study 2.1 and Study 2.2; Machiavellian Personality Scale: MPS – Study 2.1; Trait Emotional-Intelligence Questionnaire – Short Form: TEIQue-SF – Study 2.2), and *time-approach* (the Time-Style Scale: TSS, and the

Procrastination Scale: PS). Participants also completed a self-report measure of perceived stress: the *Perceived Stress Questionnaire* (PSQ) that measures subjective levels of experienced stress in life (in the last month).

Results. Study 2.1 did not support the hypothesized beneficial contribution of DMC performance to the stress-domain. That is, performance on the skills measured by traditional, mostly cognitively oriented, decision-making tasks was not significantly related to reported levels of stress in the student sample. The results, however, demonstrated that individual differences in *social skills/competence* explained 13% of the variance in perceived stress. Specifically, the results demonstrated that distrustful social character tendencies relate to more stress, whereas tendencies of an amoral social character relate to less stress. Finally, individual differences in *time-approach* explained 32% of the variance in perceived stress. Specifically, the past-oriented and the anxious time-styles related to more stress.

Study 2.2 largely confirmed the results in Study 2.1. The DMC was not significantly related to reported levels of perceived stress. However, the measure of social skills/competence explained 22% of the variance in perceived stress. Trait emotional-intelligence was the significant predictor, with higher reports of this skill/disposition related to less stress. Moreover, Study 2.2 demonstrated that time-approach explained 31% of the variance in perceived stress. The anxious and the future-oriented time-styles were significantly predictive and related to higher stress levels.

Discussion. Study 2 both rejected and confirmed the hypothesis. In both the student sample and the police investigator sample, the skills measured by the DMC had no predictive validity for levels of perceived stress. However, the results illuminate the social nature of everyday (including the working life) decision making. For example, Study 2.1 demonstrated that individuals who have a distrustful attitude toward others are more likely to experience stress. Distrust of others can make decision-makers to miss opportunities for collaboration (at least in the long run). In Study 2.2, trait emotional-intelligence substantially contributed to the explanation of variance in perceived stress. This result illustrates that the ability to correctly acknowledge emotional reactions in oneself and in other people, as well as recognize that one can regulate and control these reactions, are relevant for understanding the decision making and stress relationship.

Furthermore, considering individual differences in time-approach, reports of a *past-oriented* and/or *anxious* approach to time corresponded to higher levels of stress. In contrast, procrastination was not related to perceived levels of stress in Study 2.1 or in Study 2.2. However, this result is consistent with reports in previous research that, in terms of stress, procrastinators may experience short-term benefits (Tice & Baumeister, 1997). Moreover, in the police investigator sample of Study 2.2, a future-orientated time style related to higher reports of stress. This result can be related to recent research on how variances in time-horizons (e.g., by age) can influence decision making (Bruine de Bruin et al., 2014; Strough et al., 2014).

In sum, Study 2 showed that cognitive decision-making competence (i.e., the DMC) may not target the abilities needed to make decisions that help people decrease and cope with perceived stress. However, when the definition of decision-making competence is broadened to include social skills/competence and time-approach, high associations between the predictor variables and perceived stress were observed. These results were apparent both in the student sample (Study 2.1) and in the police investigators (Study 2.2).

The fact that the skills measured by the DMC did not predict stress may be explained by the nature of the two samples. Both samples were fairly homogenous. If the relation between DMC performance and stress was to be explored in a more heterogeneous samples (e.g., a large community sample) a significant relation might be observed. This is an issue for future research.

Yet the results from Study 2 indicate that when a definition of decision-making competence mainly targets cognitively oriented abilities needed for good decisions, the definition may not apply to everyday/working life decision-making outcomes in terms of stress. However, when the definition of competence is expanded to include decision-making abilities in terms of social skills/competence and time-approach, predictive validity is demonstrated. As stress is important for individuals' health and quality of life as well as for the effectiveness and stability in organizations, Study 2 underlines the need to explore the consequences of a broadened concept of decision-making competence in everyday life.

Study 3

Aim. Responding to the call for a better understanding of individual differences in decision making (Appelt et al., 2011), Study 3 explored the relationship between decision-making styles and social skills/competence and time-approach. As decision-making styles refer to the way people usually and preferably respond to, approach, and manage decision making, it could be assumed that stylistic differences relate to an individual's social skills/competence and time-approach.

Some researchers have studied the relationship between decision-making styles and social skills (e.g., Di Fabio & Kenny, 2012) and time-approach (Carelli et al., 2011). Nevertheless, this research is selective or has not focused on these relationships. Consequently, the nature of such relationships is still unclear and merits further research. Therefore, Study 3 investigated how decision-making styles relate to individual differences in *social orientation* (i.e., social skills/competence) and *time-approach* (i.e., time-styles and procrastination behavior).Study 3 investigated these relationships in two sub-studies: Study 3.1 and Study 3.2.

Additionally, as the definition of decision-making styles suggests that styles to some extent are context-dependent (Scott & Bruce, 1995), Study 3.2 explored if, and how, reports of styles relate to *perceived decision-making demands*. To explore this, participants in Study 3.2 were asked to rate (10 items specifically developed for this investigation, and 2 items for each "stylistic demand") the decision-making demands they perceive in their working-life.

Method. Study 3.1 consisted of 118 university students who completed a web-based questionnaire. Study 3.2 consisted of 90 police investigators (the same sample as in Study 2.2) who used either a web or a paper-and-pen questionnaire. The questionnaires included the following scales: the *General Decision-Making Style inventory* (GDMS); the *Machiavellian Personality Scale* (MPS – only used in Study 3.1); the *Self-Monitoring Scale* (SMS); the *Trait Emotional- Intelligence Questionnaire – Short Form* (TEIQUE-SF – only used in Study 3.2); the *Time Style Scale* (TSS); the *Procrastination Scale* (PS); and questions about perceived decision-making demands (only used in Study 3.2).

Results. Study 3.1 showed that decision-making styles related to personal characteristics in social orientation and time-approach. However, the Intuitive style was not as clearly related to these characteristics as the other four styles were. The Rational style was related to reports of a desire for status (sub-scale on the MPS), and the time-styles preference for economic time,

tenacity and future-oriented. In contrast, the Intuitive style related only to social orientation in terms of the SMS sub-scale sensitivity to the expressive behavior of others. The Spontaneous style related to amorally manipulative tendencies (sub-scale on the MPS), sensitivity for expressive behavior of others and ability to modify self-presentation (SMS), as well as to the time-styles preference for quick return and (negative relation) preference for economic time. Moreover, the Avoidant style was strongly related to procrastination behavior and also related to the anxious, non-organized, past-oriented time-styles as well as negatively related to the submissive and the tenacious time-styles. The Avoidant style was also related to distrust of others (sub-scale on the MPS). The Dependent style related to the preference for economic time and past-oriented time-styles, reports of procrastination behavior and (negative relation) sensitivity to the expressive behavior of others (SMS).

Study 3.2 provided additional support for the results of Study 3.1. Yet, in this professional sample, the Intuitive and the Spontaneous styles were not found to be related to variation in social orientation or time-approach. However, the Rational style was found to be related to the preference for economic, tenacious, and (negative relation) the non-organized time-styles. In contrast, both the Avoidant and the Dependent style were again found to be strongly related to the social and time-approach characteristics. Specifically, the relations for the Avoidant style found in Study 3.1 were replicated especially demonstrating a strong relation to procrastination behavior. Related to the observed relation between the Avoidant style and distrust of others observed in Study 3.1, a the Avoidant style was (negatively) related to trait-EI (i.e., TEIQue-SF). Furthermore, the relationship between the Dependent style and the social and time-approach characteristics were mostly replicated. However, the Dependent style was found to be related to the future-oriented time-style, not the past-oriented (as in Study 3.1). Moreover, the Dependent style was negatively related to trait-EI. .

Discussion. The results of the two sub-studies in Study 3 show that decision-making styles are related to people's social-orientation and approach to time. These results suggest that the understanding of people's approach to decision making would benefit by more attention on these characteristics. In both Study 3.1 and Study 3.2, the Rational style was related to the preference for economic time and tenacious time-styles. This suggest that people who prefer to take a deliberate and structured approach in their decision making also has this approach in their overall use of time. In the student sample of Study 3.1, self-monitoring was positively related to the Intuitive style and specifically to the Spontaneous style. However, a negative

relationship was found between self-monitoring and the Dependent style. In the police investigator sample of Study 3.2, self-monitoring was not significantly related to the decision-making styles. These differences in results may be explained by an inclination among younger people (i.e., the university students of Study 3.1) to be more sensitive to the reactions and expressions of other people and to be more motivated to "put up a front" of being in control (i.e., modify self-presentation and behave amoral). In contrast, older people prefer to make decisions independently (Delaney et al., 2015).

Both the Avoidant style and the Dependent style have been related to (decision) anxiety (Dewberry et al., 2013b). Our results support this suggestion but indicate that different kinds of anxiety could explain why people tend to use the Avoidant style or the Dependent style. The participants who used the Dependent style had more internally-oriented worries and anxieties (i.e., lower reports of emotion regulation – i.e., a negative relationship to trait-EI scores) and to be less sensitivity for other peoples' signals and expressive behaviors (i.e., a negative relationship to the SMS sub-dimension of *sensitivity to expressive behavior of others*). In contrast, people who use the Avoidant style were more characterized by social-oriented anxiety in terms of a fear of failure and being negatively evaluated by others, as well as not being able to understand other people's emotions or intentions. This interpretation is based on the positive relationship between the Avoidant style and procrastination (Study 3.1 and Study 3.2), the anxious time style (Study 3.1 and Study 3.2), the association with distrust of others (Study 3.1) as well as the negative relation with trait-EI (Study 3.2).

A further contribution of Study 3.2 is the exploration of the relationship between decision-making styles and perceived contextual decision-making demands. Overall, the observed correlations between decision-making styles and decision-making demands illustrate that all styles were positively related to demands for the same style. However, the results also show that perceived demands not necessarily make people approach decision making accordingly; perceived demands may instead make people avoid approaching decisions in ways that stand in clear contrast with these perceived demands.

General Discussion

This thesis explored what skills and features that characterize a competent decision maker, and how successful real-life decision making can be defined, in people's everyday life and work. Specifically, the studies reported in the thesis addressed the following three questions. *First*, is it possible to strengthen the predictive power of an existing, mostly cognitively-oriented, definition of individual differences in decision-making competence (i.e., the Decision-Making Competence scale: DMC; Bruine de Bruin et al., 2007) by widening the definition of competence to incorporate decision-related aspects of social skills/competence and time-approach? *Second*, how is an objective, normatively-defined, indicator of individual differences in real-life decision-making outcomes related to other, subjectively-defined indicators? *Third*, are individual differences in decision-making styles related to social- and time-oriented characteristics and to how decision-making demands are perceived?

The main results from the three studies reported in the present thesis are discussed below. The discussion begins with a widened definition of individual differences in decision-making competence. The discussion then turns to the relationship between, and the usefulness of, different indicators of real-life decision-making outcomes. Here the focus is on the issue of attending to adequate criteria of decision quality. Thereafter the results of the examination of decision-making styles relationships to individual differences in social orientation and time-approach are discussed. Then the overall results reported in the thesis are integrated and discussed. This discussion focuses on the importance, and the difficulties, of trying to map the factors that contribute to successful decision making in the complex web of everyday life. The discussion concludes with comments on the limitations of the thesis and offers suggestions for future research.

The ability to make good decisions

Study 1 (consisting of Study 1.1, Study 1.2 and Study 1.3) explored the predictive power of three factors of decision-making competence were explored for subjective (*the experience of daily hassles*; i.e., the SRLE, and *satisfaction with life*; i.e., the SWLS) and objective (*reports of being able to avoid negative consequences of decision making*; i.e., the DOI) indicators of real-life decision-making outcomes. The three factors of competence included measures of skills/competence that were a) cognitively-oriented, b) socially-oriented and c) time-oriented. The assumption behind the choice of these competence factors is that all

three capture individual differences in the skills/competence needed to perform good decision-making processes in real-life.

Contrary to our expectations, the results of Study 1 showed that the cognitively-oriented competence factor did not significantly explain the variance in decision-making outcomes. This lack of significant explanation was found in both samples studied. Moreover, and surprisingly, the insignificance of the cognitively-oriented competence factors was observed for both the subjective and the objective indicators of real-life decision-making outcomes.

However, as expected, individual differences in the socially-oriented competence factor significantly explained the variance in the decision-making outcomes measured. In both Study 1.2 and Study 1.3, the socially-oriented decision-making skills/competence significantly explained both the subjective and the objective indicators of real-life decision-making outcomes. The result of Study 1.3 showed that reported trait-emotional intelligence was the only single significant predictor for the objective indicator.

The results also supported the assumption that the time-oriented factor of decision-making competence significantly explains variance in real-life decision-making outcomes. In both Study 1.1 and Study 1.2 the explanation provided by individual differences in perceptions of, and general approach to, time was significant and substantial. For the subjective indicators of decision-making outcomes, the explanation provided by the time-oriented competence factor was somewhat more sample-specific compared to the socially-oriented competence factor. Looking at the objective indicator of real-life decision-making outcomes (i.e., the DOI), the results demonstrated that the time-oriented competence factor contributed to the overall explanation of the variance even though the contribution of the single aspects of time-approach was insignificant.

In sum, the results in Study 1.1 and Study 1.2 did not support the hypothesis that skills/competence measured by traditional decision-making tasks (i.e., the cognitively-oriented competence factor) hold predictive validity for the explanation of real-life decision-making success. However, the results supported the idea that the ability to correctly respond to and adapt one's decision making in accordance with the demands of the social setting is related to more positive decision-making outcomes. Furthermore, Study 1.1 and Study 1.2

support the hypothesis that it is important to pay attention to individual differences in time-approach in order to explain decision-making success in real-life.

Study 2 (consisting of Studies 2.1 and 2.2) expanded the exploration of the three competence factors by investigating their predictive validity of the subjective indicator of everyday decision-making outcome in terms of perceived stress. As in Study 1, the three decision-making competence factors (i.e., cognitively-oriented, socially-oriented, and time-oriented) were presumed to target skills/competencies that (on average) contribute to effective decision-making processes. As such processes generally are expected to produce more positive decision-making outcomes, these skills/competencies presumably comprehend essential coping resources for preventing and dealing with perceived stress.

The relationships between the three competence factors and perceived stress were explored in two studies. The results of Study 2 largely confirmed the results of Study 1. Contrary to our expectation, the predictive validity of the decision-making skills/competence measured by the DMC (i.e., the cognitively-oriented competence factor) did not significantly explain stress. Yet the skill/competence measured by the DMC component consistency in risk perception was a significant predictor of perceived stress in Study 2.2.

Furthermore, the results of Study 2 demonstrated that the measures of socially-oriented decision-making skills/competence had predictive ability for reported levels of perceived stress. In sum, these results reveal that differences in how people approach others, how they recognize and respond to social cues, and how they effectively understand and regulate emotional reactions in themselves and in others are important skills/competence that helps to explain variations in real-life decision-making outcomes.

The results of Study 2.1 and Study 2.2 also provide additional support for the importance of including individual differences in time-approach in a wider definition of decision-making competence. In sum, the results suggest it is more important to not have a negative approach to time (i.e., to have an improper temporal focus and/or experience anxiety in time-related activities) than it is beneficial to have a positive approach (e.g., to structure time and be tenacious). The results also suggest that procrastinators may not experience stress at least not in an early stage, and therefore do not "mend their ways" (Tice & Baumeister, 1997).

Study 3 (consisting of Study 3.1 and Study 3.2) examined further the effects and importance of attending to social and time-related characteristics in order to understand individual differences in decision making. Specifically, the results of Study 3 shows that differences in how people usually respond to, and preferably approach, decision making relate to their general social orientation and time-approach. However, social orientation and time-approach features were only observed to be sporadically or non-significantly related to the decision-making styles proposed by Dewberry et al., (2013b) to reflect how people make decisions (i.e., the core-processes targeted by the Rational, the Intuitive and the Spontaneous style).

The result of Study 3.2 further suggests that decision-making styles reflect not only how individuals usually and preferably approach decision making but also how they perceive or disregard decision-making demands (as well as which decision-making demands they take into consideration). These results confirm that styles to some extent are context dependent, but also that styles reflect how people perceive contextual demands. While intriguing, these results of Study 3.2's should be examined further and replicated. Such research would help us better understand decision-making styles in general. In short, personal characteristics in terms of social orientation and time-approach can increase our understanding of when and if people make decisions.

Measuring decision-making competence – in everyday life

In the integration of the results from Study 1 and Study 2, the complexity of real-life decision making is made evident. Individual differences in the socially-oriented and the time-oriented factors of decision-making competence demonstrated predictive validity in the eight statistical tests of significance, for five indicators of real-life decision-making outcomes, and in the three different samples. In contrast, the overall benefits associated with the cognitively-oriented competence factor were not supported.

What conclusions and suggestions can be drawn from these results? To begin, the results of this thesis contribute to wider and more detailed picture of individual differences in decision-making competence. Specifically, this thesis contributes by demonstrating the importance of attending to social skills/competence and time-approach in a wider definition of decision-making competence that is related to subjective indicators of decision-making outcome.

The results of the studies reported in this thesis expands previous reports that social aspects and approach to time influence peoples' decision making (see, e.g., Hafenbrack et al., 2013; Strough et al., 2014). Furthermore, the basic assumptions of, and results reported in, this thesis are related and largely consistent with the recently suggested direction in DMC research, emphasizing the importance of considering peoples' motivation (Strough et al., 2015) and self-control (Weller et al., 2014).

To some extent, the results also show that a definition of decision-making competence is contingent on the criteria used to evaluate decision quality. The contingent relevance is that the results do not show that competence, defined in terms of cognitive ability to adhere to normative standards of rationality, was more important for the objective decision quality criteria than for subjective decision quality criteria. While other researchers have reported a relationship between the cognitively-oriented definition of competence and normative and objective decision quality criteria (e.g., Bruine de Bruin et al., 2007; Parker et al., 2015), this result was not replicated in this thesis. Moreover, it is important to note that other researchers have reported predictive validity for the cognitively-oriented definition of competence to other outcomes than the DOI (e.g., Parker & Weller, 2015; Weller et al., 2012; Weller et al., 2014).

How can these differences in support for the importance or relevance of the DMC be explained? It is possible that the differences in the samples studied and/or the outcomes measured to some extent may account for the different results. The smaller and rather homogenous samples of this thesis may have restricted the power of the DMC evidenced in the results. Furthermore, the subjective outcome measures used in this thesis may not be indicators of decision-making outcomes that a cognitively-oriented definition of decision-making competence (i.e., the DMC) can (or even aspires to) have predictive validity of. However, if our results replicate, is worth noting that if the DMC cannot measure competence in specific samples of fairly ordinary proportion and is not related to decision outcomes relevant for peoples' everyday decision making, this is a limitation and constraint on its usefulness.

In addition, considering that the different measures and indicators of outcome used in previous DMC research mainly has taken an objective approach (e.g. Parker & Weller, 2015; Weller et al., 2012; Weller et al., 2014), one may ask the following: Can recommendations

and interventions be designed that improve people's decision making be motivated on the basis of a definition of competence that specifically (i.e., restrictively) relates to objective assessments of decision outcomes? That is, if this definition of competence has no positive effect on decision makers' experiences (e.g., fewer everyday problems, more satisfaction, and less stress), then the appeal of such recommendations and interventions would seem to come seriously into question.

When the definition of decision-making competence was widened to include essential aspects of decision-related social skills/competence, a significant explanation of both objective and subjective real-life decision-making outcome indicators was observed. Overall, this result supports the suggestion that decision-making science should acknowledge the social nature and function of decisions (e.g., Sanfey, 2007; Tetlock, 1985). In the complexity of everyday life, being able to adhere, adapt, and respond to (shifting) demands in social settings (where most everyday decision making occurs) may sometimes be more important than being able to resist cognitive heuristics and biases. Putting peoples' everyday decision making competence in a larger perspective, this conclusion relates to the fundamental human motivation to be accepted and included in social and interpersonal relationships (Baumeister & Leary, 1995).

Decision making is omnipresent. The results in this thesis clearly demonstrate that individual differences in how people perceive time, in the feelings that time-oriented activities evoke, and in how people structure or manage time are essential aspects of the general ability to make good decisions. This result is in line with the specific reports (e.g., Frederick et al., 2002; Stratham et al., 1994) and more general reports (e.g., Gupta et al., 2012; Usunier & Valette-Florence, 2007; Wittman & Paulus, 2007; Zimbardo & Boyd, 1999) of the importance to attend to differences in time-approach when trying to understand decision making. Based on the results reported in this thesis, a wider definition of decision-making competence would recognize such differences.

Measuring decision quality – in everyday life

Besides the contribution to a wider understanding of individual differences in decision-making competence, the results of this thesis also shed some light on the issue of decision quality in real-life settings. As noted in the Introduction, the recurring reference to the predictive validity of the DMC for real-life decision-making outcomes (see, e.g., Bruine de

Bruin, 2012; Campitelli & Gobet, 2010; Carnevale et al., 2011; Del Missier et al., 2012; Fischhoff, 2010; Jacobson et al., 2012; Mäntylä et al., 2012; Strough et al., 2015; Weaver & Stewart, 2012; Weller et al., 2012; Weller et al., 2014) has primarily been based on objective and normative definition of decision-making outcomes as measured by the DOI (Bruine de Bruin et al., 2007). However, researchers have persuasively demonstrated that decision quality is difficult to define and should not be regarded as a unitary construct (e.g. Higgins, 2001; Keys & Schwartz, 2007; Schwartz et al., 2010; Yates, 2001; Yates et al., 2003). Therefore, this thesis explored how scores on the DOI relate to, and if the predictive validity of the DMC can be demonstrated for, other indicators of real-life decision-making outcomes.

The results of this thesis show that the objectively and normatively-defined real-life decision-making outcome(s) measured by the DOI are related to some subjective indicators of real-life decision-making outcome(s). Hence, the capability of avoiding negative outcomes in real-life decision making was related to fewer reports of daily hassles and to lower levels of perceived stress. These results can be interpreted in two ways. The results may be considered to provide additional support for the validity of the DOI and also to support the idea that it is useful to attend to different measures when assessing decision quality in everyday life (Yates et al., 2003). The usefulness of a multifaceted approach is also supported by the fact that the different outcomes measures were significantly related, but that the observed correlations were rather small. Furthermore, although the DOI undoubtedly captures some aspect of decision-making success, it is still a measure that requires more validation and development (for a discussion, see Parker et al., 2015).

Furthermore, another important aspect of a multi-faceted approach to the assessment of decision quality is demonstrated by the inconsistent result for the relationship between the DOI and reports of satisfaction with life. The results in this thesis indicate that experiences of negative decision-making outcomes have different effects on people's general satisfaction with life, depending on the context. To illustrate, it may be that life satisfaction standards in homogenous samples are more similar than they are in heterogeneous samples. As a consequence, the relation between experiences of negative outcomes (e.g., large debts, not being able to secure a loan, etc.) and satisfaction could be more difficult to identify in homogenous samples.

This interpretation is related to the recent report that negative decision-making outcomes are more common among younger people and among people with lower socio-economic status (Parker et al., 2015). That is, the inconsistent relationship between the DOI and life satisfaction (including general goal-fulfillment) observed in Study 1 may depend on sample differences. For example, although personal goals and standards differ, it is reasonable that such differences vary more in the community (i.e., the community sample in Study 1.1) and may vary less in a more homogenous sample (i.e., the social workers in Study 1.3). Hence, the observed relationship between reports of the ability to avoid negative decision-making outcomes and life satisfaction (Study 1.3) may be explained by the combination of more consistent (personal) standards in the sample and the lower frequency of negative decision-making outcomes among older people with higher socio-economic status (Parker et al., 2015).

Furthermore, a possible confounding factor for this observed relation may be given by the fact that social workers face negative decision-outcomes on a daily basis. This fact, in turn, may incline social workers to be more aware of and more satisfied to having been able to avoid such outcomes themselves. However, these are only speculative interpretations of the inconsistent results and future research should explore this issue further.

Understanding individual differences in decision-making styles

Why do people approach decision making differently? In other words, how are individual differences in decision-making styles explained? This thesis explored the assumption that stylistic differences relate to variations in people's overall social orientation and approach to time. The results (Study 3) provide some support for, and further insights to, this assumption. Both social and time characteristics were clearly related to the Avoidant and the Dependent styles. These results are in line with the two-factor model by Dewberry et al. (2013b), proposing that the Avoidant and the Dependent styles reflect regulating processes (i.e., if and when decisions are made). However, yet in line with the two-component model, only sporadic or non-significant relations were observed between social and time characteristics and the Rational, Intuitive and Spontaneous styles proposed to reflect core processes (i.e., how decisions are made).

Relating these results to Dewberry et al.'s two-factor model and to the theoretical understanding and definition of decision-making styles, the following suggestions can be

made. For example, because people use a combination of styles in their approach and management of decision making (Scott & Bruce, 1995), two analyses should be made of reports on decision-making styles. That is, one analysis attends to the reports of *how* decisions preferably and usually are made (i.e., core processes as reflected by the Rational, the Intuitive and the Spontaneous style). A second analysis would address the variation of inclinations for if and when decisions are made. Then, the relation between individuals' reports of these two aspects in peoples approach to their decision making should be analyzed. This differentiation could lead to a more comprehensive and theoretically sound understanding of individual differences in decision-making styles (Appelt et al., 2011). As a specific example, two separate analyses could improve the description and understanding of results such as the positive correlations between the Rational style and the Dependent style (e.g., Study 3.2) that also have been reported (but not explained) in previous research (Bavol'ar & Orosova, 2014; Loo, 2000). Hence, from such a differentiated perspective, a positive relation between the Rational style and the Dependent style can support that it is sometimes rational to consult (the opinion of) other people or let others decide (e.g., due to organizational regulations or requirements).

Additionally, the understanding of decision-making styles would benefit by further attention to the demands and requirements people perceive. In particular, this research would be helpful when stylistic differences are explored in specific samples and contexts such as different work-life settings. Ultimately, such explorations would add a dimension to the interpretations of which styles are more prevalent and related to specific outcomes in some professions but not in others (e.g., Allwood & Salo, 2011). In Study 3, in which this issue was explored, the results revealed a complex relationship between perceived demands and reports of styles. Study 3.2 showed that perceptions of demands are related to decision-making styles. The results did also show that perceived demands sometimes seem to make people try to avoid approaching decision making in ways that contrasts with, rather than corresponds to perceived demands. However, this research area is new. Future research needs to explore, further develop and validate the questions posed in Study 3.2 to measure perceived demands.

Pro-social skills/competence and "dark intelligence"

A basic assumption in this thesis is that social skills/competence can contribute to good decision-making processes, ultimately leading to decisions that are accepted and

approved by others and have more subjectively positive consequences. Moreover, social skills/competence may improve the chance for (successful) decision implementation. Nevertheless, a topic not discussed in this thesis is that the nature of and motives behind social skills/competence are not always pro-social. Egoistic or anti-social motives may drive these social orientations. For example, paying attention to the emotions and reactions of other people, as well as monitoring one's self-presentation, can have a manipulative motivation.

Consistent with this idea, researchers have reported that self-monitoring, emotional intelligence, and Machiavellianism can have a complex relationship (Grieve, 2011). It has also been suggested that emotional-intelligence can be a "dark-intelligence", when used to emotionally manipulate others (Nagler, Reiter, Furtner, & Rauthmann, 2015). However, researchers have reported that people with a history of documented anti-social behavior perform less well on measures of decision-making skills (Sorge, Skilling, & Toplak, 2015). Thus, in the context of everyday decision making and in the long run, it is reasonable to assume that pro-social skills relate to better decision-making processes and outcomes compared to "dark-intelligence". Still, the recent increase in explorations of the dark side of social skills and of the relationship between anti-social behavior and decision making presents an issue that needs to be attended to by decision-making competence research.

Emotion regulation strategies and decision making

Overall, the results of this thesis support the idea that the ability to acknowledge, regulate, and express one's emotions contributes to decision-making efficiency and success. Two measures reflecting such abilities are used in the thesis: self-monitoring and trait-emotional intelligence. In brief, the results demonstrate that the abilities and dispositions of trait-emotional intelligence are associated with positive outcomes, whereas the results for, and effects of, the SMS are less clear. For example, reports of SMS were related to higher levels of perceived stress in Study 2.

A possible explanation of these results may be found in the emotion-regulation literature. In this research, emotion-regulation strategies are described in terms of (behavioral) *suppression* and (cognitive) *reappraisal*. Suppression is defined as a strategy that involves efforts to inhibit or control emotion-expressive behavior. Reappraisal, in contrast, is a regulative process that occurs at an earlier stage and concerns a reassessment of emotion-laden information used to control the emotional impact (Gross, 2002). Suppression is

generally considered a less effective strategy than reappraisal, which has also been observed in the context of social interactive decision making (van Wout, Chang, & Sanfey, 2010).

Self-monitoring is an example of suppression whereas the definition of trait-emotional intelligence largely overlap with the definition of reappraisal. Grecucci and Sanfey (2015) proposed that investigating how different emotion-regulation strategies affect peoples' real-life decisions is an important issue that needs to be given further attention. Hence, future research in this area could include both these two measures (i.e., self-monitoring and trait-emotional intelligence).

The effects of time-approach on decision making

This thesis explored how individual differences in the perceptions of and overall approach to time constitute an important component of a wider definition of decision-making competence. In total, the results clearly support this idea. However, the prediction of variance in the studied indicators for decision-making outcomes was mainly provided by negative time characteristics, such as reports of procrastination behavior and the anxious time-style. Hence, based on these results, it seems more obstructive to *not* being able to correctly, or subjectively, value time than it is beneficial to value, structure and be persistent in the use of time. Nevertheless, these findings may be somewhat context-dependent.

Arguably, the university students and the professionals in the studies, overall, probably have a profitable approach to time. Consequently, if the effect of time-approach as a component of decision-making competence is explored in a larger and more heterogeneous sample, the results might be quite different. For instance, a community population sample may have more variation in the approach to time. Therefore it is possible that the benefits of time-approach in terms of structuring one's time and being persistent may provide significant explanation in these samples.

Limitations

Despite considerable efforts to enlarge the samples in the studies of the thesis (i.e., the sample of students and the professional samples), the samples are rather small. Therefore, their size may limit the generalizability of the conclusions. It has been suggested that research on the DMC could more profitably use larger and more heterogeneous samples (Bruine de Bruin et al., 2012).

Yet research using fairly homogeneous samples is also of relevance. Previous research on the DMC has used somewhat homogeneous samples (e.g., Carnevale et al., 2011) or suggested that such samples should be used (Campitelli & Gobet, 2011). Moreover, the hierarchical regression models used in this thesis were chosen to respond to this possible limitation by separating the predictors into separate blocks. Thus, the research for this thesis may provide insights into the relevance of attending to individual differences in DMC among (homogenous) professional samples.

Other possible limitations are the cross-sectional design and the use of self-reports. Future research might benefit from applying a longitudinal design and data collection with peer ratings, for example, of social skills (however, on the usefulness of peer ratings see Weller et al., 2014; Wood & Highhouse, 2014).

Also, a possible concern could be the choice of examining real-life decision-making outcomes using self-reports of life satisfaction. A criticism of this choice derives from the fact that previous research reports a problematic relationship between decision making and life satisfaction by, for example, demonstrating that preferences are unstable (Kahneman et al., 1997) and that people have a limited ability for affective forecasting (Wilson & Gilbert, 2005). However, in this thesis, the approach is distinguished by its exploration of how aspects of *overall* decision-making competence relate to *overall* levels of satisfaction and general goal-fulfillment in life. Moreover, if a definition of decision-making competence does not have predictive power for subjective criteria of decision quality, the relevance of this definition of competence could be debated.

Furthermore, a possible limitation concerns methodological biases (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For example, because the studies collected data by the use of self-reports, there may be issues of self-perception or social desirability biases. In addition, there could also be a possibility of common method biases due to common scale formats and common scale anchors for some social/time measures and dependent variables. The fact that the predictor and criteria variables were measured at the same time may have produced some artificial covariance. Even if this is a general problem for all similar research, this possibility should be noted when considering the results. Future research should attempt to overcome these limitations in methodology.

Finally, the fact that no corrections of p-values were performed for the multiple statistical tests in the correlations can also be regarded a limitation. However, the benefits of corrections such as Bonferroni have been questioned (Perneger, 1998). In this thesis, the repeated studies were performed, and the main relationships were replicated, which to some extent respond to these possible concerns.

Conclusions and directions for future research

In conclusion, this thesis contributes insights to the understanding of the skills/competence and features that explain individual differences in decision making. The main contribution is given by the reports of how differences in social skills/competence and time-approach constitute important components of a widened definition of decision-making competence. Furthermore, the claim is that these personal characteristics relate to, and to some extent even explain, variations in how people approach decision making in terms of decision-making styles.

Decision making is the process of choosing between alternative courses of actions and/or finding a solution to a problem. However, the thesis approaches this process from a broad although not original perspective (e.g., Loewenstein, 2001). Yet this perspective differs from the traditional perspective in decision-making science. More specifically, this thesis recognizes the importance of attending to the social dimension (see, e.g.. Keren & Bruine de Bruin, 2003; Lerner & Tetlock, 1999; Stanovich, 2013; Tetlock, 1985, 2002) and subjective experiences of decision making (see, e.g., Higgins, 2000; Keys & Schwartz, 2007; Milkman et al., 2009; Schwarz et al., 2010; Weiss & Weiss, 2010; Wood & Highhouse, 2014). Thus, in this perspective - choosing socially accepted alternatives and solutions to problems that result in better subjective experiences - is a useful and reasonable sound approach to defining decision-making competence and decision quality in peoples' everyday lives.

Although the thesis argues that decision making should be approached from a wider perspective, it does not claim that a narrower perspective has no importance. However, the narrower perspective has not been neglected in decision-making science whereas the wider perspective to a large extent has.

Based on the results of the present thesis, some ideas about future research directions can be raised. For instance, future decision-making competence research may focus more specifically on the relationship between decision making and self-regulation. Effective

decision making is largely a matter of behavior regulation (e.g., Loewenstein, 2001). In this regard, both the socially-oriented and the time-oriented decision-making competence factors examined in the thesis can be considered to reflect aspects of self-control. Although the relationship between self-regulation/self-control and decision-making skills/competence has been previously studied (e.g., Parker & Fischhoff, 2005; Sorge et al., 2015; Weller et al., 2014), different approaches could complement this research.

For example, the literature on ego-depletion reports that the relationship between self-control and decision making seems to depend on the same underlying cognitive resource (Schmeichel, Vohs, & Baumeister, 2003).The relationship between self-control and decision making is perhaps even more important to note with regards to the reports that the underlying resource can be strengthened (Baumeister, Vohs, & Tice, 2007; Muraven, Baumeister, & Tice, 1999). Yet recent research suggest that reports of impairment in repeated self-control performances (e.g. decision making) reflects a shift in motivation and attention, not a depletion in resource (Inzlicht & Schmeichel, 2012). Thus, in terms of high-lighting the importance of motivation, this development can to some extent be considered consistent with recent developments in DMC-research (e.g. Bruine de Bruin et al., 2015; Strough et al., 2015).

The issue of if and to what extent aspects of decision-making competence can be learned, practiced, and developed probably constitutes the most important question for future research. Education in DMC skills has been explored with positive results only in high-school settings (Jacobsson et al., 2012). When the widened definition of decision-making competence, which this thesis supports, is used, alternatives and possibilities for interventions increase. For example, it has been reported that aspects of self-monitoring (i.e., self-presentation, see Seeley & Gardner, 2003) as well as emotional intelligence (Di Fabio & Kenny, 2011) can be increased by practice. Furthermore, Claessen et al. (2007) reports that training increases time management skills although the effect on performance is less clear.

The results of the research for this thesis do not support the predictive validity of the skills measured by the DMC to provide explanation of the variance in real-life decision-making outcomes. Future research might include other traditional decision-making tasks than the ones currently targeted by the DMC. The exploration of other tasks was proposed in the original work on the DMC (Bruine de Bruin et al., 2007). It should also be noted that some

components of the DMC may be in need of revisions, or at least some consideration, before being targeted in research. For example, the two aspects of framing-effects comprehended by the component *resistance to framing* in the DMC (i.e., attribute and risky-choice) have been reported to differ. Specifically, attribute framing has been suggested to be related to System-1 processes whereas risky-choice framing has been suggested to depend on System-2 processes (Levin, McElroy, Gaeth, Hedgcock & Denburg, 2014). Thus, although framing-effects are important to study, the appropriateness of (always) calculating and using a total-score for framing-effects in DMC-research may be questioned. Presumably, alterations of tasks would be most useful for research on cognitively-oriented decision-making competence related to specific groups or professional domains (see, e.g., Carnevale et al., 2011). Related to this, a research possibility could be the development of a version of the DMC designed for educated samples (see e.g. Cokely et al., 2012).

To acquire a deeper understanding of general decision-making competence, the relevance of performance on traditional decision-making tasks (the DMC) as well as individual differences in social skills and time-approach should be explored in diverse contexts and with diverse samples. This research could include the outcome measures used in the studies of this thesis, as well as others. Such explorations may help to further develop the construct validity for decision-making competence research by examining which criteria of decision quality that measures of decision-making competence can or cannot explain. In addition, as emphasized by Campitelli and Gobet (2010), future research should explore how decision-making competence relates to specific (i.e., expert) decision-making competence.

Finally, future research could look at the usefulness of attending to other aspects of social skills and time-approach than those studied in this thesis. Other individual characteristics, theoretically related to the ability to make god decisions, could also be explored.

References

Allwood, C. M. & Hedelin, L. (2005). Adjusting new initiatives to the social environment: Organizational decision making as learning, commitment creating and behavior regulation. In H. Montgomery, R. Lipshitz, & B. Brehmer (Eds.), *How professionals make decisions*, Mahwah, N.J. USA, Lawrence Erlbaum Associates.

Allwood, C. M., & Salo, I. (2012). Decision-making styles and stress. *International Journal of Stress Management, 19*(1), 34-47. doi: 10.1037/a0027420

Appelt, K. C., Milch, K. F., Handgraaf, M. J. J., & Weber, E. U. (2011). The decision making individual differences inventory and guidelines for the study of individual differences in judgment and decision-making research. *Judgment and Decision Making, 6*(3), 252-262.

Averbeck, B. B., & Duchaine, B. (2009). Integration of social and utilitarian factors in decision making. *Emotion, 9*(5), 599-608. DOI: 10.1037/a0016509

Baradell, J. G. & Klein, K. (1993). Relationship of life stress and body consciousness to hypervigilant decision making. *Journal of Personality and Social Psychology, 64*(2), 267-273.

Baron, J. (1994). Nonconsequentialist decisions. *Behavioral and Brain Sciences, 17*, 1-42. DOI: 10.1017/S0140525X0003301X

Baron, J. (2012). The point of normative models in judgment and decision making. *Frontiers in Psychology, 3(577)*, 1-3. DOI: 10.3389/fpsyg.2012.00577

Baumeister, R. F. & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529.

Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: The self as controlling agent. In A. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles.* (2nd ed., pp. 516-539). New York: Guilford.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, *16*(6), 351-355.

Bavol'ar, J., & Orosova, O. (2015). Decision-making styles and their associations with decision-making competencies and mental health. *Judgment and Decision Making, 10*(1), 115-122.

Bechara, A., & Damasio, A. R. (2005). The somatic marker hypothesis: a neural theory of economic decision. *Games and Economic Behavior, 52*, 336-372. DOI: 10.1016/j.geb.2004.06.010

Bettman, J. R., Luce, M. F., & Payne, J. W. (1998). Constructive consumer choice processes. *Journal of Consumer Research*, 25, 187-217.

Bruine de Bruin, W. (2013). Judgement and decision making in adolescents. In M.K. Dhami, A. Schlottmann, & M.R. Waldmann (Eds.), *Judgment and Decision Making as a Skill: Learning, Development and Evolution*. pp. 85-111.

Bruine de Bruin, W., Del Missier, F., & Levin, I. P. (2012). Individual differences in decision-making competence. *Journal of Behavioral Decision Making, 25*, 329-330. DOI: 10.1002/bdm.753

Bruine de Bruin, W., Dombrovski, A. Y., Parker, A. M., & Szanto, K. (2015). Late-life depression, suicidal ideation, and attempted suicide: The role of individual differences in maximizing, regret, and negative decision outcomes. *Journal of Behavioral Decision Making*, *doi:* 10.1002/bdm.1882

Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2007). Individual differences in adult decision-making competence. *Journal of Personality and Social Psychology, 92*, 938-956. DOI: 10.1037/0022-3514.92.5.938

Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2012). Explaining adult differences in decision-making competence. *Journal of Behavioral Decision Making, 25*, 352-360.

Bruine de Bruin, W., Parker, A. M., & Strough, J. (2014). Getting older isn't all that bad: Better decisions and coping when facing "sunk costs". *Psychology and Aging*, *29*(3), 642-647. DOI: 10.1037/a0036308

Butler, H. A. (2012). Halpern critical thinking assessment predicts real-world outcomes of critical thinking. *Applied Cognitive Psychology, 26*, 721-729. DOI: 10.1002/acp.2851

Butler, H. A., Dwyer, C. P., Hogan, M., Franco, A., Rivas, S. F., Saiz, C., & Almeida, L. S. (2012). The Halpern critical thinking assessment and real-world outcomes: Cross national applications. *Thinking Skills and Creativity, 7*, 112-121. DOI: 10.1016/j.tsc.2012.04.001

Campbell, W. K., Hoffman, B. J., Campbell, S. M., & Marchisio, G. (2011). Narcissism in organizational contexts. *Human Resource Management Review, 21*(4), 268-284. Doi: 101016/j.hrmr.2010.10.007

Campitelli, G., & Gobet, F. (2010). Herbert Simon's decision making approach: Investigations of cognitive processes in experts. *Review of General Psychology, 14*(4), 354-364. DOI: 10.1037/a0021256

Carnevale, J. J., Inbar, Y., & Lerner, J. S. (2011). Individual differences in need for cognition and decision-making competence among leaders. *Personality and Individual Differences, 51*, 274-278. DOI:10.1016/j.paid.2010.07.002

Carelli, M. G., Wiberg, B., & Wiberg, M. (2011). Development and construct validation of the Swedish Zimbardo time perspective inventory. *European Journal of Psychological Assessment, 27*(4), 220-227. DOI: 10.1027/1015-5759/a000076

Cokely, T. E., Galesic, M., Schulz, E., Ghazal, S., & Garcia-Retamero, R. (2012). Measuring risk literacy: The Berlin numeracy test. *Judgment and Decision Making, 7*(1), 25-47.

Christie, R., & Geis, F. (1970). *Studies in Machiavellianism*. San Diego, CA: Academic Press.

Claessens, B. J. C., van Erde, W., & Rutte, C. G. (2007). A review of the time management literature. *Personnel Review, 36*(2), 255-276.

Curseu, P. L., & Schruijer, S. G. L. (2012). Decision styles and rationality: An analysis of the

predictive validity of the General Decision-Making Style Inventory. *Educational and Psychological Measurement, 72*(6), 1053-1062. DOI: 10.1177/0013164412448066

Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2008). The development and validation of a new Machiavellianism scale. *Journal of Management, 35*, 219-257. DOI:10.1177/0149206308318618

Day, D. V., Schleicher, D. J., Unckless, A. L., & Hiller, N. J. (2002). Self-monitoring personality at work: A meta-analytic investigation of construct validity. *Journal of Applied Psychology, 87*(2), 390-401. DOI: 10.1037//0021-9010.87.2.390

Dekay, M. L., Patiño-Echeverri, D., & Fishbeck, D. S. (2009). Better safe than sorry: Precautionary reasoning and implied dominance in risky decisions. *Journal of Behavioral Decision Making, 22*, 338-361. DOI: 10.1002/bdm.630

Delaney, R., Strough, J., Parker, A. M., & Bruine de Bruin, W. (2015). Variations in decision-making styles by age and gender: A cluster-analytic approach. *Personality and Individual Differences*, *85*, 19-24. http://dx.doi.org/10.1016/j.paid.2015.04.034

Del Missier, F., Mäntylä, T., & Bruine de Bruin, W. (2012). Decision-making competence, executive functioning, and general cognitive abilities. *Journal of Behavioral Decision Making 25*(4), 331-351. DOI: 10.1002/bdm.731

Dewberry, C., Juanchich, M., & Narendran, S. (2013a). Decision-making competence in everyday life: The roles of general cognitive styles, decision-making styles and personality. *Personality and Individual Differences, 55*, 783-788. http://dx.doi.org/10.1016/j.paid.2013.06.012

Dewberry, C., Juanchich, M., & Narendran, S. (2013b). The latent structure of decision styles. *Personality and Individual Differences, 54*, 566-571. http://dx.doi.org/10.1016/j.paid.2012.11.002

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

Di Fabio, A., & Kenny, M. E. (2012). The contribution of emotional intelligence to decision styles among Italian high school students. *Journal of Career Assessments, 20*(4), 404-414. DOI: 10.1177/1069072712448893

Di Fabio, A., & Palazzeschi, L. (2009). Emotional intelligence, personality traits and career decision difficulties. *International Journal of Educational and Vocational Guidance, 9*, 135-146. DOI 10.1007/s10775-009-9162-3

Finucane, M. L., & Gullion, C. M. (2010). Developing a tool for measuring the decision-making competence of older adults. *Psychology and Aging, 25*(2), 271-288. DOI: 10.1037/a0019106

Fischhoff, B. (2010). Judgment and decision making. *WIREs Cognitive Science, 1*, 724-735.

Fischhoff, B., Slovic, P., & Lichtenstein, S. (1980). Knowing what you want: Measuring labile values. In T. Wallsten, (Ed.), *Cognitive processes in choice and decision behavior* (pp. 117-141). Hillsdale, NJ: Erlbaum.

Fletcher, J. M., Marks, A. D. G., & Hine, D. W. (2011). Working memory capacity and cognitive styles in decision making. *Personality and Individual Differences, 50*, 1136-1141. DOI:10.1016/j.paid.2011.02.002

Flynn, F. J., Reagans, R. E., Amantullah, E. T., & Ames, D. R. (2006). Helping ones way to the top: Self-monitors achieve status by helping others and knowing who helps whom. *Journal of Personality and Social Psychology, 91*(6), 1123-1137. DOI: 10.1037/0022-3514.91.6.1123

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*(4), 25-42.

Frederick, S., Loewenstein, G., & O'Donoghue, T. (2003). Time discounting and time preference: A critical review. In G. Loewenstein, D. Read & R. Baumeister (Eds.), *Time and decision – Economic and psychological perspectives on intertemporal choice* (pp. 13-86). New York: Russell Sage.

Frisch, D. (1993). Reasons for framing effects. *Organizational Behavior and Human Decision Processes, 39*, 399-429.

Frisch, D., & Clemen, R. T. (1994). Beyond expected utility: Rethinking behavioral decision research. *Psychological Bulletin, 116*(1), 46-54. DOI: *10.1037/0033-2909.116*

Frith, C. D., & Singer, T. (2008). The role of social cognition in decision making. Philosophical Transactions of the Royal Society Biological Sciences, 363*, 3875-3886. DOI:* 10.1098/rstb.2008.0156

Galotti, K. M. (1999). Making a "major" real-life decision: College students choosing an academic major. *Journal of Educational Psychology, 91*(2), 379-387.

Galotti, K. M., Ciner, E., Altenbaumer, H. E., Geerts, H. J., Rupp, A., & Woulfe, J. (2006). Decision-making styles in a real-life decision: choosing a college major. *Personality and Individual Differences, 41*(4), 629-639. DOI :10.1016/j.paid.2006.03.003

Gangestad, S. W., & Snyder, M. (2000) Self-monitoring: appraisal and reappraisal. *Psychological Bulletin*, *126*(4), 530-555. DOI: 10.1037//0033-2909.126.4.530

Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review, 103*(4), 650-669.

Gigerenzer, G. & Gaissmaier, G. (2011). Heuristic decision making. *Annual Review of Psychology*, 62, 451-482. DOI: 10.1146/annurev-psych-120709-145346

Gilovich, T., Griffin, D. W., & Kahneman, D. (Eds.) (2002). *Heuristics and Biases – The Psychology of Intuitive Judgment*. New York: Cambridge University Press.

Green, M. C., Visser, P. S., & Tetlock, P. E. (2000). Coping with accountability cross-pressures: Low-effort evasive tactics and high-effort quests for complex compromises. *Personality and Social Psychology Bulletin, 26*(11), 1380-1391.

Grecucci, A., & Sanfey, A. G. (2015). Emotion regulation and decision making. In Gross, J. J. (Ed.), *Handbook of Emotion Regulation* (2:nd ed.), (pp. 140-153). New York, The Guilford Press.

Grieve, R. (2011). Mirror mirror: the role of self-monitoring and sincerity in emotional manipulation. *Personality and Individual Differences, 51*, 981-985. doi: 10.1016/j.paid.2011.08.004

Gross, J. J. (2002). Emotion regulation: affective, cognitive, and social consequences. *Psychophysiology, 39*, 281-291. Doi: 10.1017.S0048577201393198

Gupta, R., Hershey, D. A., & Gaur, J. (2012). Time perspective and procrastination in the workplace: An empirical investigation. *Current Psychology, 31*(2), 195-211. DOI: 10.1007/s12144-012-9136-3

Hafenbrack, A. C., Kinias, K., & Barsade, S. G. (2013). Debiasing the mind through meditation: Mindfulness and the sunk-cost bias. *Psychological Science 25*, 369-376. doi: 10.1177/0956797613503853

Hamilton, R., Vohs, K. D., Sellier, A. L., & Meyvis, T. (2011). Being of two minds: Switching mindsets exhausts self-regulatory resources. *Organizational Behavior and Human Decision Processes, 115*, 13-24. doi:10.1016/j.obhdp.2010.11.005

Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist, 55*, 1217-1227. *DOI: 10.1037 10003-066X.55.11.1217*

Hsee, C. K. & Hastie, R. (2006). Decision and experience: why don't we choose what makes us happy? *TRENDS in Cognitive Science, 10*(1), 31-37. Doi: 10.1016/j.tics.2005.11.007

Hultell, D., & Gustavsson, J. P. (2008). A psychometric evaluation of the Satisfaction With Life Scale in a Swedish nationwide sample of university students. *Personality and Individual Differences, 44*, 1070-1079. DOI: 10.1016/j.paid.2007.10.030

Inbar, Y., Botti, S., & Hanko, K. (2011). Decision speed and choice regret: When haste feels like waste. *Journal of Experimental Social Psychology, 47*, 533-540. DOI:10.1016/j.jesp.2011.01.011

Inzlicht, M. & Schmeichel, B. J. (2012). What is ego depletion? Toward a mechanistic revision of the resource model of self-control. *Perspectives on Psychological Science, 7(5)*, 450-463.

Jacobson, D., Parker, A., Spetzler, C., Bruine de Bruin, W., Hollenbeck, K., Heckerman, D. & Fischhoff, B. (2012). Improved learning in U.S. history and decision competence with decision-focused curriculum. *PLoS ONE*, *7*(9), e45775. doi:10.1371/journal.pone.0045775

Jain, K., Bearden, J. N., & Filipowicz, A. (2013). Do maximizers predict better than satisficers? *Journal of Behavioral Decision Making, 26*, 41-50. Doi: 10.1002/bdm.763

Joireman, J., Balliet, D., Sprott, D., Spangenberg, E., Schultz, J. (2008). Consideration of future consequences, ego depletion and self-control: support for distinguishing between CFC-immediate and CFC-future subscales. *Personality and Individual Differences, 45*, 15-21.

Kahneman, D., & Tversky, A. (2000). *Choices, values, and frames*. New York: Cambridge University Press.

Kahneman, D., Wakker, P. P., & Sarin, R. (1997). Back to Bentham? Explorations of experienced utility. *Quarterly Journal of Economics, 122*, 375-405.

Keren, G., & Bruine de Bruin, W. (2003). On the assessment of decision quality: Considerations regarding utility, conflict and accountability. In D. Hardan & L. Macchi (Eds.), *Thinking: Psychological perspectives on reasoning, judgment and decision making* (pp. 347-363). New York: Wiley.

Keys, D. J., & Schwartz, B. (2007). "Leaky" rationality: How research on behavioral decision making challenges normative standards of rationality. *Perspectives on Psychological Science, 2*(2), 162-180. DOI: 10.1111/j.1745-6916.2007.00035.x

Kirkebøen, G., Vasaasen, E., & Teigen, K. H. (2013). Revisions and regret: the cost of changing your mind. Journal of Behavioral Decision Making, 26, 1-12. Doi: 10.1002/bdm.756

Kohn, P. M., & Macdonald, J. E. (1992). The survey of recent life experiences: A decontaminated Hassles scale for adults. *Journal of Behavioral Medicine, 15*, 221- 236.

Koolhaus, J. M., Bartolomucci, A., Buwalda, B., de Boer, S. F., Flügge, G., Korte, S. M., … Fuchs, E. (2011). Stress revisited: A critical evaluation of the stress concept. *Neuroscience and Biobehavioral Reviews, 35*, 1291-1301. doi:10.1016/j.neubiorev.2011.02.003

Kozhevnikov, M. (2007). Cognitive styles in the context of modern psychology: Toward an integrated framework of cognitive style. *Psychological Bulletin, 133*(3), 464-481. DOI: 10.1037/0033-2909.133.3.464

Lay, C. H. (1986). At last, my research article on procrastination. *Journal of Research in Personality, 20*, 474-495.

Lennox, R. D., & Wolfe, R. N. (1984). Revision of the self-monitoring scale. *Journal of Personality and Social Psychology, 46*(6), 1349-1364. DOI: 10.1037/0022-3514.46.6.1349

Leonard, N. H., Scholl, R. W., & Kowalski, K. B. (1999). Information processing style and decision making. *Journal of Organization Behavior, 20*, 407-420.

Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the effects of accountability. *Psychological Bulletin, 125*(2), 255-275. DOI: 10.1037/0033-2909.125.2.255

Levin, I. P., McElroy, T., Gaeth, G. J., Hedgcock, W., & Denburg, N. L. (2014). Behavioral and neuroscience methods for studying neuroeconomic processes: What can we learn from framing effects. In Reyna, V. F., & Zayas, V. (Eds.), *The Neuroscience of Risky Decision Making*, (pp. 43-69). Washington D.C., U.S.: American Psychological Association.

Leykin, Y. & DeRubeis, R. J. (2010). Decision-making styles and depressive symptomatology: development of the decision styles questionnaire. *Judgment and Decision Making 7*(5), 506-515.

Loewenstein, G. (2001). The creative destruction of decision research. *Journal of Consumer Research, 28*, 499-505.

Loewenstein, G., Read, D. & Baumeister, R. F. (2003), *Time and deci*sion – *Economic and psychological perspectives on intertemporal choice*. New York: Russell Sage.

Loo, R. (2000). A psychometric evaluation of the General Decision-Making Style Inventory. *Personality and Individual Differences, 29*(5), 895-905.

March, J. G. (1991). How decisions happen in organizations. *Human Computer Interaction, 6*, 95-117.

Mark, G. M., & Smith, A. P. (2008). Stress models: A review and suggested new direction. In *J. Houdmont., & S. Leka. (Eds), Occupational health psychology* (pp. 111-144) Nottingham, UK, *Nottingham University Press*

Mavroveli, S., Petrides, K. V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being and peer-rated social competence in adolescence. *British Journal of Developmental Psychology, 25*, 263-275. DOI:10.1348/026151006X118577

Mikels, J. A., Maglio, S. J., Reed, A. E., & Kaplowitz, L. J. (2011). Should I go with my gut? Investigating the benefits of emotion-focused decision making. *Emotion, 11*(4), 743-753.

Mikolajczak, M., Balon, N., Ruosi, M., & Kotsou, I. (2012). Sensitive but not sentimental: Emotionally intelligent people can put their feelings aside when necessary. *Personality and Individual Differences, 52*, 537-540.

Mikolajczak, M., & Luminet, O. (2008). Trait emotional intelligence and the cognitive appraisal of stressful events: An exploratory study. *Personality and Individual Differences, 44*, 1445-1453. DOI: 10.1016/j.paid.2007.12.012

Milkman, K. L., Chugh, D., & Bazerman, M. H. (2009). How can decision making be improved? *Perspectives on Psychological Science, 4*(4), 379-383.

Muraven, M., Baumeister, R. F., & Tice, D. M. (1999). Longitudinal improvement of self-regulation through practice: building self-control through repeated exercise. *Journal of Social Psychology, 139*, 446-457.

Mäntylä, T., Still, J., Gullberg, S., & Del Missier, F. (2012). Decision making in adults with ADHD. *Journal of Attention Disorders, 16*(2), 164-173, DOI: 10.1177/1087054709360494

Nagler, U. K. J., Reiter, K. J., Furtner, M. R., & Rauthmann, R. F. (2014). Is there a "dark-intelligence"? Emotional intelligence is used by dark personalities to emotionally manipulate others. *Personality and Individual Differences, 65*, 47-52. doi: 10.1016/j.paid.2014.01.025

Pacini, R., & Epstein, S. (1999). The relation of rational and experimental information processing styles to personality, basic beliefs, and the ratio-basis phenomenon. *Journal of Personality and Social Psychology, 76*(6), 972-987.

Parker, A. M., Bruine de Bruin, W. & Fischhoff, B. (2007). Maximizers versus satisficers: Decision-making styles, competence, and outcomes. *Judgment and Decision Making, 2*(6), 342-350.

Parker, A. M., Bruine de Bruin, W., & Fischhoff, B. (2015). Negative decision outcomes are more common among people with lower decision-making competence: an item-level analysis of the Decision Outcome Inventory (DOI). *Frontiers in Psychology, 6*:363, 1-7. Doi: 10.3389/fpsyg.2015.00363

Parker, A. M., & Fischhoff, B. (2005). Decision-making competence: External validation through an individual-differences approach. *Journal of Behavioral Decision Making*, *18*, 1-27. DOI: 10.1002/bdm.481

Parker, A. M., & Weller, J. A. (2015). Greater decision-making competence is associated with greater expected-value sensitivity, but not overall risk-taking: an examination of concurrent validity. *Frontiers in Psychology*, 6:717. doi: 10.3389/fpsyg.2015.00717

Paulhaus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality, 36*, 556-563.

Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment, 5*(2), 164-172.

Perez, J. C., Petrides, K. V., & Furnham, A. (2005). Measuring trait emotional intelligence. In R. Schuzel & R. D. Roberts (Eds.), *International handbook of trait emotional intelligence* (pp. 88-203). Cambridge MA: Hogrefe & Huber.

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *British Medical Journal*, *316*, 1236-1238. DOI: 10.1136/bmj.316.7139.1236

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15*, 425-448. DOI: 10.1002/per.416

Petrides, K. V., & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organizational variables. *Journal of Applied Psychology, 36*(2), 552-569.

Peters, E., Västfjäll, D., Gärling, T., & Slovic, P. (2006). Affect and decision making: A "hot" topic. *Journal of Behavioral Decision Making, 19*, 79-85. DOI: 10.1002/bdm.528

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903. doi: 10.1037/0021-9010.88.5.879

Polman, E., (2010). Why are maximizers less happy than satisficers? Because they maximize positive and negative outcome. *Journal of Behavioral Decision Making, 23*, 179-190. DOI: 10.1002/bdm.647

Raffaldi, S., Iannello, P., Vittani, L., & Antonietti, A. (2012). Decision-making styles in the work-place: Relationships between self-report questionnaires and a contextualized measure of the analytical-systematic versus global-intuitive approach. *SAGE Open*. DOI: 10.1177/2158244012448082

Ramsøy, T. Z., Skov, M., Macoveanu, J., Siebner, H. R., & Fosgaard, T. R. (2015). Empathy as a neuropsychological heuristic in social decision-making. *Social Neuroscience, 10*(2), 179-191. DOI: 10.1080/17470919.2014.965341

Riding, R., & Cheema, I. (1991). Cognitive styles – an overview and integration. *Educational Psychology: An International Journal of Experimental Educational Psychology, 11*(3-4), 193-215. http://dx.doi.org/10.1080/0144341910110301

Rilling, J. K., & Sanfey, A. G. (2011). The neuroscience of social decision-making. *Annual Review of Psychology, 62*, 23-48. DOI: 10.1146/annurev.psych.121208.131647

Ritov, I., & Baron, J. (1990). Reluctance to vaccinate: Omission bias and ambiguity. *Journal of Behavioral Decision Making, 3*, 263-277.

Roets, A., Schwartz, B., & Guan, Y. (2012). The tyranny of choice: a cross-cultural investigation of maximizing-satisficing effects on well-being. *Judgment and Decision Making, 7*(6), 689-704.

Salo, I., & Allwood, C. M. (2011). Decision-making styles, stress and gender among investigators. *Policing, 34*(1), 97-119.

Sanfey, A. G. (2007). Social decision-making: Insights from game theory and neuroscience. *Science, 318*(4850), 598-602. DOI: 10.1126/science.1142996

Santos-Ruiz, A., Garcia-Rios, M.C., Fernandez-Sanchez, J.C., Perez-Garcia, M., Muñoz-García, M.A., & Peralta-Ramirez, M.I. (2012). Can decision-making skills affect responses to psychological stress in healthy women? *Psychoneuroendocrinology*, http://dx.doi.org/10.1016/j.psyneuen.2012.04.002

Scheibehenne, R. G. & Todd, P. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research, 3*(37), 409-425, doi: 10.1086/651235

Scott, S. G., & Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement, 55*(5), 818-831.

Schmeichel, B. J., Vohs, K. D., & Baumeister, R. F. (2003). Intellectual performance and ego depletion: Role of the self in logical reasoning and other information processing. *Journal of Personality and Social Psychology, 85*(1), 33-46.

Schwartz, B. (2004). *The paradox of choice: Why more is less.* New York: Harper Collins Publishers.

Schwartz, B., Ben-Haim, Y., & Dacso, C. (2010). What makes a good decision? Robust satisficing as a normative standard of rational decision making. *Journal for the Theory of Social Behavior, 41*(2), 209-227.

Schwarz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*(5), 1178-1197. DOI: 10.1037//0022-3514.83.5.1178

Seeley, E. A., & Gardner, W. L. (2003). The "selfless" and self-regulation: The role of chronic other-orientation in averting self-regulatory depletion. *Self and Identity, 2,* 103-117. DOI: 10.1080/15298860390129872

Sevdalis, N., Petrides, K. V., & Harvey, N. (2007). Trait emotional intelligence and decision-related emotions. *Personality and Individual Differences, 42*, 1347-1358. DOI:10.1016/j.paid.2006.10.012

Shafir, E., & LeBouef, R. A. (2002). Rationality. *Annual Review of Psychology, 53*, 491-517.

Sims, C. R., Neth, H., Jacobs, R. A., & Gray, W. D. (2013). Melioration as rational choice: sequential decision making in uncertain environments. *Psychological Review, 1*(120), 139-154. DOI: 10.1037/a0030850

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2002). The affect heuristic. In T. Gilovich, D. W. Griffin, & D. Kahneman (Eds.), *Heuristics and biases – The psychology of intuitive judgment* (pp. 397-420). New York: Cambridge University Press.

Smith, K., Shanteau, J., & Johnson, P. (2004). What does it mean to be competent? In K. Smith, J. Shanteau & P. Johnson (Eds.), *Psychological investigations of competence in decision making* (pp. 1-4). Cambridge, UK: Cambridge University Press.

Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology, 30*(4), 526-537. DOI: 10.1037/h0037039

Sorge, G. B., Skilling, T. A., & Toplak, M. E. (2015). Intelligence, executive functions, and decision making as predictors of antisocial behavior in an adolescent sample of justice-involved youth and a community comparison group. *Journal of Behavioral Decision Making.* Doi: 10.1002/bdm.1864

Spector, P. E., & Johnson, H-A. M. (2006). Improving the definition, measurement, and application of emotional intelligence. In Murphy, K. R. (Ed.), *A Critique of Emotional Intelligence: What are the Problems and How Can They Be Fixed?* (pp. 325-344). New Jersey, U.S.: Lawrence Erlbaum Associates.

Stanovich, K. E. (2013). Why humans are (sometimes) less rational than other animals: Cognitive complexity and the axioms of rational choice. *Thinking & Reasoning, 19*, 1-26. http://dx.doi.org/10.1080/13546783.2012.713178

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences, 23*, 645-726.

Stanovich, K. E., & West. R. F. (2008). On the relative independence of thinking biases and cognitive ability. *Journal of Personality and Social Psychology, 94*, 672-695. DOI: 10.1037/0022-3514.94.4.672

Starcke, K., & Brand, M. (2012). Decision making under stress: A selective review. *Neuroscience and Biobehavioral Reviews, 36*, 1228-1248. DOI: 10.1016/j.neubiorev.2012.02.003

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133*(1), 65-94. DOI: 10.1037/0033-2909.133.1.65

Stratham, A., Gleicher, F., Boninger, D. S., & Edwards, D. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology, 66*(4), 742-752. DOI: 10.1037/0022-3514.66.4.742

Strough, J., Bruine de Bruin, W., & Peters, E. M. (2015). New perspectives for motivating better decisions in older adults. *Frontiers in Psychology*, 6:783. doi:10.3389/fpsyg.2015.00783

Strough, J., Parker, A. M., & Bruine de Bruin, W. (2015). Understanding life-span developmental changes in decision-making competence. In Hess, T., Strough, J., & Loeckenhoff, C. E. (Eds.), *Aging and Decision Making: Empirical and Applied Perspectives* (pp. 235-257). Academic Press.

Strough, J., Schlosnagle, L., Karns, T., Lemaster, P., & Pichayayothin, N. (2014). No time to waste: Restrictning life-span temporal horizons decrease the sunk-cost fallacy. *Journal of Behavioral Decision Making, 27*, 78-94. doi: 10.1002/bdm.1781

Telle, N. T., Senior, C., & Butler, M. (2011). Trait emotional intelligence facilitates responses to a social gambling task. *Personality and Individual Differences, 50*, 523-526. DOI:10.1016/j.paid.2010.11.010

Tetlock, P. E. (1985). Accountability: The neglected social context of judgment and choice. In B. Staw & L. Cummings (Eds.), *Research in organizational behavior* (Vol. 1, pp. 297-332). Greenvich, CT: JAI Press.

Tetlock, P.E. (2002). Social functionalist frameworks for judgment and choice: Intuitive politicians, theologians, and prosecutors. *Psychological Review, 109*(3), 451-471.

Thunholm, P. O. (2004). Decision-making styles: Habit, style or both? *Personality and Individual Differences, 36*(4), 931-944.

Thunholm, P.O. (2008). Decision-making styles and physiological correlates of negative stress: Is there a relation? *Scandinavian Journal of Psychology, 49*, 213-219. DOI: 10.1111/j.1467-9450.2008.00640.x

Tice, D. M., & Baumeister, R. F. (1997). Longitudinal study of procrastination, performance, stress and health: The costs and benefits of dawdling. *Psychological Science, 8*(6), 454-458.

Ursin, H., & Eriksen, H. R. (2010). Cognitive activation theory of stress (CATS). *Neuroscience and Biobehavioral Reviews, 34*, 877-881. DOI: 10.1016/j.neubiorev.2009.03.001

Usunier, J.-C., & Vallette-Florence, P. (2007). The Time Styles scale: A review of developments and replications over 15 years. *Time & Society, 16*, 333-366. DOI: 10.1177/0961463X07080272

van Wout, M., Chang, L. J., & Sanfey, A. G. (2010). The influence of emotion regulation on social interactive decision-making. *Emotion, 10*(6), 815-821. doi: 10.1037/a0020069

Vohs, K. D., Baumeister, R. F., & Ciarocco, N. J. (2005). Self-regulation and self-presentation: Regulatory resource depletion impairs impression management and effortful self-presentation depletes regulatory resources. *Journal of Personality and Social Psychology, 88*(4), 632-657. DOI: 10.1037/0022-3514.88.4.632

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology, 94*(5), 883-898. DOI: 10.1037/0022-3514.94.5.883

Wallin, A. (2013). A peace treaty for the rationality wars? External validity and its relation to normative and descriptive theories of rationality. *Theory & Psychology, 23*(4), 458-478. DOI: 10.1177/0959354313489369

Weaver, E. A., & Stewart, T. R. (2012). Dimensions of judgments: Factor analysis of individual differences. *Journal of Behavioral Decision Making, 25*, 402-413. DOI: 10.1002/bdm.748

Weiss, J. W., & Weiss, D. J. (2012). Irrational: at the moment. *Synthese*, *189*(1), 173-183. DOI 10.1007/s11229-012-0112-0

Weller, J. A., Ceschi, A., & Randolph, C. (2015). Decision-making competence predicts domain-specific risk attitudes. *Frontiers in Psychology*, 6:540. doi: 10.3389/fpsyg.2015.00540

Weller, J. A., Levin, I. P., Rose, J. P., Bossard, E. (2012). Assessment of decision-making competence in preadolescents. *Journal of Behavioral Decision Making, 25*, 414-426. DOI: 10.1002/bdm.744

Weller, J. A., Moholy, M., Bossard, E., & Levin, I. P. (2014). Preadolescent decision-making competence predicts interpersonal strengths and difficulties: A 2-year prospective study. *Journal of Behavioral Decision Making*, doi: 10.1002/bdm.1822

Whiten, A. & Byrne, R. W. (1997). *Machiavellian Intelligence II – Extensions and Evaluations*. Cambridge: Cambridge University Press.

Wilson, T. D. & Gilbert, D. T. (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science, 14*(3), 131-134.

Wittmann, M., & Paulus, M. P. (2008). Decision making, impulsivity and time perception. *Trends in Cognitive Sciences, 12*(1), 7-12. DOI: 10.1016/j.tics.2007.10.004

Wood, N. L., & Highhouse, S. (2014). Do self-reported decision-styles relate with others' impressions of decision quality? *Personality and Individual Differences, 70*, 224-228. DOI: 10.1016/j.paid.2014.06.036

Yates, J. F. (2001): "Outsider:" Impressions of naturalistic decision making. In E. Salas, & G. Klein (Eds.), *Linking expertise and Naturalistic Decision Making* (pp. 9-33). Mahwah, N.J.: Erlbaum.

Yates, J. F., Veinott, E., & Patalano, A. L. (2003). Hard decisions, bad decisions: On decision quality and decision aiding. In S. Schneider & J. Shanteau (Eds.), *Emerging perspectives in judgment and decision research* (pp. 13-63). New York: Cambridge University Press.

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*(6), 1271-1288. doi: 10.1037/0022-3514.77.6.1271

Printed in Sweden
Ale Tryckteam, 2015
ISSN 1101-718X
ISBN 978-91-628-9590-7
ISBN 978-91-628-9589-1
ISRN GU/PSYK/AVH–321–SE
http://hdl.handle.net/2077/40516