

Motivational Foundations of Consumer Behavior

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von Diplom-Volkswirt Leonhard K. Lades

geboren am 13.07.1984 in München

Gutachter 1: Professor Dr. Ulrich Witt, Max-Planck-Institut für
Ökonomik, Jena

Gutachter 2: Professor Dr. Klaus Rothermund, Friedrich-Schiller-
Universität, Jena

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Zusammenfassung

Diese interdisziplinär ausgerichtete Arbeit beschäftigt sich mit den motivationalen Grundlagen des Konsumverhaltens. Es werden Erkenntnisse unter anderem aus der Psychologie verwendet, um zu verstehen was Individuen in ökonomisch relevanten Situationen motiviert. Aufgrund dieser interdisziplinären Herangehensweise ähnelt die vorliegende Arbeit der Forschung in der Verhaltensökonomik. Während allerdings in der Verhaltenökonomik üblicherweise Ideen und Erkenntnisse aus der kognitiven Psychologie in die Ökonomik integriert werden (Angner and Loewenstein, 2012), benutzt diese Arbeit eher Erkenntnisse aus der Motivationspsychologie, den Neurowissenschaften und der Biologie um ökonomisches Verhalten zu analysieren. Genauer gesagt argumentiert diese Arbeit, dass Individuen häufig konsumieren um unterschiedliche physiologische und psychologische Konsumbedürfnisse zu befriedigen (Witt, 2001). Für Ökonomen liegt der große Vorteil einer Bedürfnis-basierten Erklärung von Präferenzen darin, dass Präferenzen nun (zumindest zum Teil) objektiviert werden können. Diese Objektivierung von Präferenzen liegt im starken Gegensatz zu anderen Ansätzen innerhalb der Ökonomik. Die Neoklassik nimmt beispielsweise an, dass Präferenzen ausschließlich subjektiv sind. Auch die Verhaltensökonomik beschäftigt sich nur mit einem sehr spezifischen Teil der Präferenzen (nämlich mit Zeitpräferenzen, Risikopräferenzen und sozialen Präferenzen).

Der Fokus auf die motivationalen Grundlagen ökonomischen Verhaltens und die Bedürfnis-basierte Erklärung von Präferenzen grenzt diese Arbeit also von der Forschung in der Verhaltensökonomik ab. Trotz dieses Unterschiedes, soll diese Arbeit Verhaltensökonomien ansprechen, weil ich hoffe in dieser Subdisziplin der Ökonomik auf die geringste Ablehnung zu stoßen.¹ Diese Hoffnung wird durch Entwicklungen der letzten Jahre innerhalb der Verhaltensökono-

¹Man muss eingestehen, dass interdisziplinäre Forschung zwischen Ökonomen und Psychologen üblicherweise nicht ohne Schwierigkeiten abläuft. Beispielsweise ist die Kommunikation zwischen beiden Disziplinen manchmal schwierig, weil weder Ökonomen noch Psychologen viel über die jeweils andere Disziplin wissen (Fetschenhauer et al., 2011). Da aber das Erlangen dieses Wissens viel Aufwand erfordert, sind die Hindernisse für interdisziplinäres Arbeiten relativ hoch. Aus diesem Grund habe ich mich entschieden Verhaltensökonomien anzusprechen, denn diese sind schon eher vertraut mit (mit Sicherheit aber interessiert an) interdisziplinärer Forschung. Es ist nicht sehr wahrscheinlich, dass diese Arbeit bei traditionellen neoklassischen Ökonomen Anklang findet.

mik bestärkt. So zeigen Angner and Loewenstein (2012), dass die Verhaltensökonomik zwar traditionell stark mit der kognitiven Psychologie verbunden ist, diese Verknüpfung aber in den letzten Jahren merklich an Stärke verliert. Immer häufiger werden auch Erkenntnisse aus anderen Subdisziplinen der Psychologie auf ökonomische Fragestellungen angewendet. Angner and Loewenstein (2012) argumentieren, dass sich die Verhaltensökonomik insbesondere in drei neue Bereiche weiterentwickelt: (1) Erkenntnisse aus den Neurowissenschaften werden vermehrt verwendet. Damit verbunden ist die Ansicht, dass menschliches Verhalten gut durch duale Prozess-Modelle approximiert werden kann.² (2) Die Rolle von Emotionen in ökonomischen Entscheidungen wird immer wichtiger. (3) Verhaltensökonomien engagieren sich immer häufiger in der Wohlfahrtsökonomik und geben Politikempfehlungen ab³.

In Bezug auf diese Entwicklungen in der Verhaltensökonomik, verfolgt diese Arbeit drei Ziele. Das erste, recht allgemeine Ziel ist es, einen Beitrag zur wachsenden, interdisziplinären Forschung zwischen Ökonomen und Psychologen zu leisten. Dadurch soll diese Forschung voran getrieben werden und neue Möglichkeiten in diesem Bereich der interdisziplinären Forschung aufgezeigt werden. Das zweite Ziel ist es zu zeigen, dass ein Bedürfnis-basiertes Verständnis von Präferenzen die Verhaltensökonomik, insbesondere die kürzlichen Entwicklungen innerhalb der Verhaltensökonomik, unterstützen kann. Als drittes Ziel soll diese Arbeit zeigen, dass für die Beantwortung mancher ökonomisch relevanter Fragen, die Bedürfnis-basierte Erklärung von Präferenzen besser geeignet ist, als es Ansätze in der Verhaltensökonomik und der Neoklassik sind.

Kapitel 2 wirft einen Blick auf interdisziplinäre Forschung zwischen Ökonomik und Psychologie und analysiert, in wie weit psychologische Erkenntnisse sich wandelnde Konsumpräferenzen erklären können. Insbesondere diskutiert das Kapitel einige Schwierigkeiten, die aufkommen können, wenn Ökonomen und Psychologen zusammen arbeiten wollen. Im Bewusstsein dieser Schwierigkeiten untersucht das Kapitel, in wie weit die Bedürfnis-basierte Perspektive

²Diese Modelle sind insbesondere in den letzten Jahren mehr und mehr aufgekommen. Dies wird zum Beispiel verdeutlicht durch Kahneman's (2011) Buch, welches dessen Forschung im Hinblick auf duale Prozesse interpretiert. Auch die bald erscheinende Sonderausgabe über duale Systeme im *Journal of Economic Psychology* zeigt diese Entwicklung. Außerdem benennen Fetscherin et al. (2011) die Erkenntnis, dass menschliches Entscheidungsverhalten gut durch duale Prozesse verstanden werden kann, als eine der Schlüsselerkenntnisse, die kürzlich von der Psychologie in die Ökonomik integriert wurden.

³Unter dem Namen "liberaler Paternalismus" haben Verhaltensökonomien begonnen Politikimplikationen aus ihren Erkenntnissen zu generieren. Thaler and Sunstein's (2008) Buch *Nudge: Improving decisions about health, wealth, and happiness* ist so einflussreich, dass in den USA und Großbritannien der liberale Paternalismus schon substantielle Aufmerksamkeit von führenden Politikern bekommen hat.

sich wandelnde Präferenzen besser oder schlechter erklären kann, als es Ansätze in der Neoklassik und der Verhaltensökonomik können. Dafür unterscheidet das Kapitel zwischen Kontext-abhängigem Präferenzwandel und langfristigem Präferenzwandel. Während sich bei ersterem Präferenzen variabel mit dem Kontext verändern, ist der letztere Typ des Präferenzwandels langsamer und zeigt sich erst in der Betrachtung von Veränderungen im Konsumverhalten über mehrere Jahrzehnte hinweg.

Kapitel 2 zeigt, dass neoklassische Ansätze keine der beiden Arten des Präferenzwandels erklären können. In der neoklassischen Ökonomik wird angenommen, dass Individuen rationale Agenten mit stabilen Präferenzen sind. Außerdem ist man der Ansicht, dass selbst wenn sich Präferenzen verändern könnten, diese Veränderungen nicht Objekt ökonomischer Forschung sein sollten. Die neoklassische Ökonomik argumentiert, dass Präferenzen ausschließlich subjektiv sind. In der Verhaltensökonomik werden die Annahmen aufgehoben, dass Individuen rational sind, sich perfekt selbst kontrollieren können, immer perfekt informiert sind und nur eigensinnig handeln. Dadurch kann ein guter Anteil von Kontext-abhängigem Präferenzwandel erklärt werden. Sozio-ökonomische und evolutionsökonomische Ansätze (die in Kapitel 2 in Witt's (2001) Bedürfnis-orientierten Ansatz zusammengefasst werden) lehnen die Annahme ab, dass Präferenzen ausschließlich subjektiv sind. Dadurch können diese Ansätze langfristigen und dauerhaften Präferenzwandel teilweise erklären. Kapitel 2 schlägt daher vor, in zukünftiger Forschung den Fokus mehr auf motivationale Aspekte ökonomischen Verhaltens zu legen und dadurch den Entscheidungs-theoretischen Ansatz der Verhaltensökonomik zu komplementieren.

In Kapitel 2 wurde das mangelnde Wissen über die jeweils andere Disziplin als ein Hindernis für Forschung im Feld zwischen Ökonomik und Psychologie identifiziert. *Kapitel 3* zielt darauf ab, Ökonomen mit einem wichtigen Konzept innerhalb der Psychologie vertraut zu machen. Genauer gesagt fasst Kapitel 3 Forschung in Psychologie und Soziologie zusammen, die sich mit Identitäts-relevanten Bedürfnissen beschäftigt. Diese Identitäts-relevanten Bedürfnisse werden oft auch Selbstbildmotive genannt. Indem ein eher grober Überblick über diese Selbstbildmotive präsentiert wird, zielt Kapitel 3 darauf ab, Forschung innerhalb der Ökonomik anzustoßen, die sich mit Identitäts-relevanten Themen beschäftigt. Identitäten oder Selbstbilder stellen die Antworten dar, die Individuen sich selbst geben, wenn sie sich fragen "Wer bin ich?". In der Psychologie und anderen Geisteswissenschaften haben Selbstbilder viel Aufmerksamkeit erhalten und werden auch immer häufiger in der Ökonomik verwendet, um ökonomisch relevante Fragen zu beantworten. Allerdings, und das wird in Kapitel 3 deutlich, wird das Konzept der Identität in der Ökonomik teilweise nicht ganz akkurat verwendet. Zum Beispiel wird

häufig das Selbst (nicht das Selbstbild) vertauscht mit dem Selbstbild, das Individuen von sich haben.

Um zukünftig solche Ungenauigkeiten zu vermeiden und die Vertrautheit von Ökonomen mit psychologischen Konzepten zum Selbstbild zu erhöhen, definiert Kapitel 3 kurz was mit dem Selbstbild oder der Identität gemeint ist. Außerdem präsentiert das Kapitel die üblicherweise in der Literatur zu findenden Selbstbildmotive (die auch Identitäts-relevante Bedürfnisse genannt werden). Kapitel 3 hebt die Rollen hervor, die diese Selbstbildmotive in einigen weit verbreiteten psychologischen und soziologischen Theorien spielen. Außerdem präsentiert und diskutiert Kapitel 3 wie einige dieser Theorien in ökonomischen Analysen verwendet wurden. Zum Beispiel präsentiert Kapitel 3 den wohl bekannteste Ansatz in der Ökonomik, der Selbstbilder integriert. Kapitel 3 stellt heraus, dass dieser Ansatz von Akerlof and Kranton (2000) eine grundlegende Erkenntnis aus der Psychologie vernachlässigt: Selbstbilder sind komplex und dynamisch. Deswegen ist die Analyse im besten Fall eine Teilanalyse, die sich damit befasst, wie ein bestimmtes Selbstbild zu einem bestimmten Zeitpunkt ökonomisches Verhalten beeinflusst. Da in Kapitel 3 die motivationalen Aspekte der Selbstbilder herausgehoben werden, passt das Kapitel gut zu dem motivationalen Charakter der gesamten vorliegenden Arbeit.

Kapitel 4 befasst sich mit den motivationalen Grundlagen impulsiven Konsumverhaltens. Das Kapitel bereichert das quasi-hyperbolische Diskontierungsmodell nach Laibson (1997) um einen Mechanismus, der das Auftreten von Impulsen erklären kann. Das quasi-hyperbolische Diskontierungsmodell legt nahe, dass menschliche Verhaltenweisen durch zwei verschiedene Systeme beeinflusst werden. Kahneman (2011) folgend nennt Kapitel 4 diese beiden Systeme System 1 und System 2. Das quasi-hyperbolische Diskontierungsmodell nimmt an, dass Entscheidungen zwischen zwei Gütern, die in zwei aufeinander folgenden Zeitpunkten in der Zukunft konsumiert werden können (zum Beispiel morgen und übermorgen), ausschließlich von System 2 getroffen werden. Wenn aber Entscheidungen getroffen werden müssen, bei dem das frühere Gut schon sofort erhalten werden kann (zum Beispiel eine Entscheidung zwischen jetzt gleich und morgen), ist die Entscheidung zusätzlich noch von System 1 beeinflusst. Durch diese Annahme kann das quasi-hyperbolische Diskontierungsmodell erklären, warum dynamische Inkonsistenzen auftreten, wenn Individuen entscheiden müssen zwischen kleinen Belohnungen die früher erhalten werden können und größeren Belohnungen die erst später erhalten werden können (Berns et al., 2007; Laibson, 1997). In System 2 planen Individuen zum Beispiel häufig einem gesunden Lebensstil zu folgen, erliegen dann aber den in System 1 auftretenden Impulsen Fast Food zu essen. Neurowissenschaftliche Studien unterstützen die Annahme, dass inter-temporale Entscheidungen

von zwei unterschiedlichen Systemen beeinflusst sind. Diese Studien zeigen, dass wenn Belohnungen sofort erhältlich sind, andere Gehirnareale aktiv sind, als wenn inter-temporale Entscheidungen getroffen werden, bei denen beide Belohnungen erst in der Zukunft erhältlich sind (McClure et al., 2007, 2004). Genauer gesagt ist das Gehirnareal, das mit Belohnungen die sofort erhältlich sind korrespondiert, das mesolimbische Dopaminsystem.

Allerdings wird in der Literatur zum quasi-hyperbolischen Diskontierungsmodell nicht erklärt, warum System 1 die Konsumenten dazu treibt, die kleinere aber sofortige Belohnung zu bevorzugen. Oft wird einfach angenommen, dass System 1 myopisch ist und sofortige Belohnungen stärker bevorzugt als es System 2 tut. Auch die Rolle die Dopamin in diesem Zusammenhang spielt ist nicht weiter spezifiziert. Um diesem Phänomen auf den Grund zu gehen, bezieht sich Kapitel 4 auf neurowissenschaftliche Erklärungen von Impulsen. Genauer gesagt benutzt Kapitel 4 neue neurowissenschaftliche Erkenntnisse, die darauf hinweisen, dass Belohnungen sowohl motivationale als auch hedonische Aspekte enthalten. Arbeiten von Berridge und Kollegen unterscheiden dementsprechend zwischen dem 'Wollen' und dem 'Mögen' von Belohnungen (Berridge, 1999; Berridge and Aldridge, 2008). Diese Autoren haben herausgefunden, dass unterschiedliche Gehirnareale mit 'Wollen' und 'Mögen' korrelieren (Peciña et al., 2006). Daher ist es möglich, dass Individuen manche Güter stärker 'wollen' als sie diese 'mögen' und auch umgekehrt, Güter stärker 'mögen' als sie diese 'wollen'. Obwohl Individuen im reflektierten System 2 üblicherweise wollen was sie mögen und mögen was sie wollen, können sich 'wollen' und 'mögen' im intuitiven System 1 unterscheiden. Um solche Dissoziationen zu generieren, sind insbesondere Manipulationen des mesolimbischen Dopaminsystems hilfreich (diese System steht auch im Zusammenhang mit der Wahl kleinerer aber sofort erhältlicher Belohnungen (McClure et al., 2007, 2004)). Genauer gesagt haben Berridge und Kollegen herausgefunden, dass Manipulationen des mesolimbischen Dopaminsystems 'wollen' verändert und nicht 'mögen'. Dopamin ist also verantwortlich für die Motivation, mit der Individuen nach Belohnungen streben und nicht dafür, wie angenehm sie diese Belohnungen empfinden.

Eine bestimmte Art der Dissoziation von 'wollen' und 'mögen' kann erklären, woher die Impulse kommen, sofort erhältliche Güter zu konsumieren. Berridge und Kollegen zeigen, dass solche Impulse das Resultat von Reiz-gesteuertem 'Wollen' sein können (Berridge and Aldridge, 2008; Wyvell and Berridge, 2001). Wenn dieses Reiz-gesteuerte 'Wollen' der Grund für Impuls-käufe ist, sind diese Käufe dadurch gekennzeichnet, dass die Individuen die Güter stark wollen, aber nicht notwendigerweise erwarten, diese Güter auch stark zu mögen (und bei etwaigem Konsum die Güter auch tatsächlich nicht so stark mögen, wie es das starke Wollen suggeriert) (Berridge and Aldridge,

2008). Die erste Bedingung für das Auftreten von Reiz-gesteuertem ‘Wollen’ ist, wie der Name schon sagt, die Wahrnehmung eines Auslösereizes. Eine weitere Bedingung ist, dass das mesolimbische Dopaminsystem aktiv ist. Dieses System ist zum Beispiel aktiv, wenn wir hungrig oder durstig sind und wenn wir Stress ausgesetzt sind (Berridge, 2002; Berridge and Aldridge, 2008). Außerdem ist es wichtig, dass die Individuen über Konsumentenwissen verfügen, welches eine Verbindung zwischen dem Auslösereiz und dem Grund für die mesolimbische Aktivierung herstellt. Dieses Konsumentenwissen beinhaltet den Glauben, dass die derzeitige mesolimbische Aktivierung durch den Konsum des Gutes, welches mit dem Auslösereiz assoziiert ist, reduziert werden kann. Wenn diese drei Faktoren zusammentreffen und die Individuen nicht in der Lage sind, ihre Impulse zu kontrollieren, kann es zu Reiz-gesteuertem ‘Wollen’ kommen, so dass Individuen impulsiv kleinere aber sofort erhältliche Belohnungen größeren aber erst später erhältlichen Belohnungen vorziehen.

Kapitel 4 formalisiert diesen Mechanismus und integriert ihn in das quasi-hyperbolische Diskontierungsmodell von Laibson (1997). Genauer gesagt wird in dem neuen Modell der Mechanismus des Reiz-gesteuerten ‘Wollens’ benutzt, um das impulsive System 1 zu modellieren. Kapitel 4 nennt das neue Modell das Anreiz Salienz Modell des inter-temporalen Konsums. Dieses Anreiz Salienz Modell bietet Erklärungen für einige Phänomene, die nicht leicht zu erklären sind, wenn man verhaltensökonomische oder neoklassische Modelle verwendet. Zum Beispiel kann das Modell Gegenwartspräferenzen, den Domänen-Effekt und Größeneffekte innerhalb inter-temporaler Entscheidungen erklären. Zusätzlich kann das Modell neue Hypothesen generieren, die in Experimenten testbar sind. Das Modell legt nahe, dass Beobachtungen über Zustände, die zu mesolimbischer Aktivierung führen können (Hunger, Durst, Stress,...), Konsumentenwissen, Auslösereize, und (ein Fehlen von) Selbstkontrolle dazu genutzt werden können, um Vorhersagen im Bezug auf Impulsivität zu testen.

Da eine der notwendigen Bedingungen für das Auftreten von Reiz gesteuertem ‘Wollen’ eine Aktivierung des mesolimbischen Dopaminsystems ist, und diese Aktivierung häufig durch Bedürfnis-Deprivation generiert wird, passt dieses Modell sehr gut zu der Bedürfnis-basierten Erklärung des Konsumentenverhaltens dieser gesamten Arbeit. Außerdem passt diese Erklärung impulsiven Verhaltens zu den kürzlichen Entwicklungen innerhalb der Verhaltensökonomik. Das Kapitel zeigt, wie die Bedürfnis-basierte Erklärung von Präferenzen mit neurowissenschaftlichen Erkenntnissen kombiniert werden kann, um so zu erklären wie, wann und warum Impulse in System 1 auftreten können. Außerdem ist die Unterscheidung zwischen ‘Wollen’ und ‘Mögen’ stark mit der immer wichtiger werdenden Rolle von Emotionen in der Verhaltensökonomik verknüpft. Allerdings legt diese Unterscheidung nahe, dass bei der

Betrachtung von Emotionen diese nicht mit Motivation verwechselt werden sollten, weil ‘Wollen’ und ‘Mögen’ auch auseinander fallen können.

Kapitel 5 hängt eng mit Kapitel 4 zusammen. Auch Kapitel 5 beschäftigt sich mit impulsivem Konsum und befasst sich mit den Rollen, die die menschliche Fähigkeit des reflexiven Denkens in impulsiven Konsumsituationen spielen. Kapitel 5 unterscheidet zwischen zwei verschiedenen Einflüssen, die reflexives Denken haben kann. Auf der einen Seite ist reflexives Denken für Selbstkontrolle notwendig, weil sich Individuen nur durch reflexives Denken den langfristigen Konsequenzen impulsiven Konsums bewusst werden. Auf der anderen Seite kann reflexives Denken dazu führen, dass Impulse zu konsumieren überhaupt erst auftreten. Das Kapitel zeigt, dass der Fokus der Verhaltensökonomik auf den kognitiven Aspekten reflexiven Denkens liegt, also auf der Ausübung von Selbstkontrolle in System 2. Zum Beispiel befassen sich einige Studien in der Verhaltensökonomik mit Selbstkontrollmechanismen, die verhindern sollen, dass existierende Impulse zu impulsivem Verhalten führen (Bryan et al., 2010). Kapitel 5 geht darüber hinaus und zeigt, dass auch motivationale Aspekte reflexiven Denkens (also Selbstbildmotive) eine Rolle im impulsiven Konsum spielen können. Kapitel 5 argumentiert, dass Selbstbildmotive erklären können, warum das automatische System 1 in manchen Situationen myopisch ist und in anderen nicht. Nur durch die Analyse von System 1, so argumentiert das Kapitel, kann man verstehen, warum impulsive Entscheidungen in manchen Domänen auftreten (Identitäts-relevante Domänen wie Kleidung) aber nicht in anderen Domänen (wie zum Beispiel bei Körperpflegeprodukten). Dieser Ansatz, der sich auf das motivationale System 1 fokussiert, passt gut zu der Bedürfnis-basierten Erklärung von Präferenzen dieser gesamten Arbeit. Kapitel 5 schlägt vor, den Fokus von den Faktoren die Impulse verhindern können hin zu den Faktoren die Impulse induzieren können zu verschieben.

Um zu erklären wie Selbstbildmotive zu Impulskäufen von Gütern, die relevant für die Identität der Individuen sind, führen können, schlägt Kapitel 5 vor den in Kapitel 4 vorgestellten Mechanismus des Reiz-ausgelösten ‘Wollens’ zu verwenden. Kapitel 5 argumentiert, dass Diskrepanzen zwischen idealen und tatsächlichen Selbstbildern psychologischen Stress verursachen, der das mesolimbische Dopaminsystem aktiviert. Deswegen können Reize, die auf die sofortige Verfügbarkeit von Identitäts-relevanten Gütern hindeuten, Impulse auslösen. Diese Impulse sind dadurch gekennzeichnet, dass die Identitäts-relevanten Güter stark ‘gewollt’ werden, obwohl die Individuen nicht notwendiger Weise erwarten, dass sie diese Güter genauso stark mögen werden. Außerdem ‘mögen’ die Individuen diese Güter bei etwaigem Konsum auch nicht so stark, wie es das starke ‘Wollen’ suggeriert. Diese Unterschiede zwischen ‘Wollen’ und ‘Mögen’ können das Bedauern erklären, dass Individuen häufig

verspüren, nur kurze Zeit nachdem sie impulsiv wegen einer vorübergehenden Selbstbild-Diskrepanz Identitäts-relevante Güter wie Kleidung gekauft haben (Dittmar and Bond, 2010).

Auf Grundlage des Reiz-ausgelösten ‘Wollens’, insbesondere im Kontext der Identitäts-relevanten Güter, präsentiert Kapitel 5 Politikimplikationen für liberal paternalistische Politikeingriffe. Liberal paternalistische Eingriffe verändern den Kontext, in dem Entscheidungen getroffen werden, ohne dass die Entscheidungsfreiheit der Individuen eingeschränkt wird. Durch die Veränderung der Entscheidungsarchitektur wollen liberale Paternalisten verhindern, dass Individuen Entscheidungen treffen, die sie nach ausgiebiger Überlegung nicht getroffen hätten (Thaler and Sunstein, 2008). Im Bereich des impulsiven Konsums können solche Entscheidungen verhindert werden, wenn Unterschiede zwischen ‘wollen’ und ‘mögen’ verhindert werden. Ein Politikeingriff, der impulsives Verhalten verändert, ist also liberal paternalistisch, wenn er versucht Unterschiede zwischen ‘wollen’ und ‘mögen’ zu verringern, ohne aber die Freiheit der Individuen einzuschränken, etwas zu konsumieren, auch wenn dieser Konsum von einer Diskrepanz zwischen ‘wollen’ und ‘mögen’ gekennzeichnet ist.

Auf der einen Seite warnt Kapitel 5 vor liberal paternalistischen Eingriffen, die von dritten Parteien auf Populationen zusammengesetzt aus Individuen mit unterschiedlichen Selbstbildern angewendet werden. Genauer gesagt argumentiert das Kapitel, dass es besser ist, wenn Individuen ihr Konsumverhalten selber beeinflussen, als wenn Dritte das Konsumverhalten der Individuen beeinflussen. Liberal paternalistische Eingriffe, die das impulsive Verhalten in System 1 beeinflussen, so argumentiert Kapitel 5, können auch von System 2 vorgenommen werden. Der Grund dafür, dass eher System 2 als dritte Parteien das System 1 beeinflussen sollte ist, dass Selbstbilder subjektiv sind und es für dritte Parteien sehr schwer ist zu wissen, welches Selbstbild wie oft und wann salient ist. Daher können dritte Parteien nicht so gut wie die Individuen selber einschätzen was im Eigeninteresse der Individuen ist.

Auf der anderen Seite zeigt Kapitel 5 wie die motivationale Perspektive auf Impulskonsum neue Strategien der Beeinflussung des impulsiven System 1 generieren kann. Diese Strategien werden im Kontext des ethischen Konsums präsentiert. Das Kapitel illustriert, wie die Entscheidungsarchitektur entweder unethischen impulsiven Konsum verringern kann, oder impulsiven ethischen Konsum induzieren kann. Es werden drei Strategien unterschieden, wie sich Individuen selbst zum ethischen impulsiven Konsum verleiten können: (1) Individuen können ihre Willensstärke erhöhen, um sich vor unethischen Impulsen zu schützen, (2) sie können das Auftreten von unethischen Impulsen verringern und (3) ethische Impulskäufe induzieren, indem sie ethische Selbstbilder salient machen. Während die erste Strategie (Willensstärke

erhöhen) auch von Verhaltensökonomen vorgeschlagen wird, sind die zweite Strategie (Reduzieren von Impulsen) und die dritte Strategie (Lenken von Impulsen) das Resultat der motivationalen Perspektive, die durchgehend in dieser Arbeit eingenommen wird. Kapitel 5 zeigt also, dass die motivationale Perspektive kürzliche Entwicklungen in der Verhaltensökonomik im Bereich der Wohlfahrtsökonomik und dem Anbieten von Politikimplikationen unterstützen kann.

Kapitel 6 befasst sich nicht mehr mit impulsivem Konsum, sondern präsentiert ein formales Modell, das die langfristigen Veränderungen im Konsumverhalten über viele Jahrzehnte beschreibt. In den letzten Jahrzehnten hat sich das Konsumverhalten, gemessen durch die Allokation des Einkommens auf verschiedene Konsumgüterkategorien, stark verändert (Deaton and Muellbauer, 1980). In dieser Zeit sind die Konsumenten immer reicher geworden und getrieben durch dieses Wachstum ihres Einkommens haben sie auch die Allokation ihres Einkommens auf verschiedene Güterkategorien verändert. Zum Beispiel nehmen üblicherweise die prozentual gemessenen Einkommensanteile, die für den Konsum von Nahrungsmitteln ausgegeben werden, mit steigendem Einkommen ab (Engel, 1857). Die Ausgabenanteile für Güter wie Entertainment, Statusgüter und generell symbolische Konsumaktivitäten wachsen aber mit steigendem Einkommen (Ariely, 2009). Obwohl es für solche Veränderungen des Konsumverhaltens viele empirische Befunde gibt (Banks et al., 1997; Deaton and Muellbauer, 1980), gibt es weder in der Neoklassik noch in der Verhaltensökonomik theoretische Modelle, die solche Veränderungen erklären (nicht bloß beschreiben) können.

Wenn Präferenzen aber mit Bedürfnissen in Verbindung gebracht werden, kann man unter der Annahme differentieller Sättigung unterschiedlicher Bedürfnisse die Veränderungen im Konsumverhalten zumindest teilweise erklären (Witt, 2001). Differentielle Sättigung bedeutet, dass manche Bedürfnisse leichter zu befriedigen sind als andere. Während einige Bedürfnisse, wie das Bedürfnis nach Nahrung, mit ausreichend hohem Einkommen leicht zu befriedigen sind, sind andere Bedürfnisse, wie die nach sozialem Status, Entertainment und positiven Selbstbildern, auch mit hohem Einkommen nur schwer zu befriedigen. Mit steigendem Einkommen nähern sich die Bedürfnisse, die leicht zu befriedigen sind, relativ schnell ihrem Sättigungspunkt an. Wenn dies passiert, generieren diese Bedürfnisse weniger zusätzliche Ausgaben wenn das Einkommen weiter steigt und die Ausgabenanteile für diese Bedürfnisse sinken. Bedürfnisse, die aber relativ schwierig zu befriedigen sind, generieren weiter Ausgaben, so dass die Ausgabenanteile für diese Bedürfnisse steigen. Dementsprechend kann ein Bedürfnis-basiertes Verständnis von Präferenzen erklären, warum manche Güter notwendige Güter sind (deren Ausgabenanteile mit steigendem Einkommen abnehmen) und andere Güter Luxusgüter

sind (deren Ausgabenanteile mit steigendem Einkommen zunehmen). So ist man nicht mehr auf empirische ad hoc Ergebnisse angewiesen, um Güterkategorien in notwendige Güter und Luxusgüter aufzuteilen, sondern kann auch theoretische Vorhersagen treffen.

In dem in Kapitel 6 vorgestellten Modell verteilen die Individuen ihr Einkommen nach einer Entscheidungsregel, die von Herrnstein et al.'s (1997) Matching Law abgeleitet ist. Genauer gesagt verteilen die Individuen ihr Einkommen so, dass die Verteilung des Einkommens auf die verschiedenen Konsumgüterkategorien proportional zu der motivationalen Stärke der dazugehörigen Bedürfnisse ist. Die motivationale Stärke der Bedürfnisse ist durch den derzeitigen Deprivationsgrad der Bedürfnisse definiert. Um das Modell zu veranschaulichen, präsentiert Kapitel 6 die Konsumdynamiken in einer wachsenden Volkswirtschaft, in der nur zwei Güter und nur zwei dazu passende Bedürfnisse existieren. Die Güter sind Nahrungsmittel und Statussymbole und die dazu passenden Bedürfnisse sind das Bedürfnis nach Kalorien und das Bedürfnis nach sozialer Anerkennung. Der Unterschied zwischen den beiden Bedürfnissen ist, dass das Bedürfnis nach Kalorien einen konstanten Sättigungspunkt hat, der Sättigungspunkt des Bedürfnisses nach sozialer Anerkennung aber proportional mit dem Einkommen ansteigt. Dementsprechend ist das Bedürfnis für soziale Anerkennung schwieriger zu befriedigen als das Bedürfnis nach Kalorien, wenn das Einkommen relativ hoch ist. Konsistent mit empirischen Befunden (Deaton and Muellbauer, 1980) zeigt das Modell, dass mit steigendem Einkommen die Ausgabenanteile für Nahrungsmittel sinken und die Ausgabenanteile für Statusgüter ansteigen. Der Matching-Ansatz kann auch einige empirische Befunde replizieren, die viele Nutzenmaximierungsmodelle nicht replizieren können. Zum Beispiel kann das Matching-Modell rekonstruieren, dass die Einkommenselastizitäten für Nahrungsmittel mit steigendem Einkommen sinken (Blundell et al., 1993). Dementsprechend kann die sich verändernde Allokation des Einkommens wenn Individuen reicher werden auch formal in einem mathematischen Modell durch eine Analyse der Sättigungsmuster verschiedener Bedürfnisse erklärt werden.

Zusätzlich vergleicht Kapitel 6 die Engelkurven, die durch die oben beschriebene Allokation des Einkommens erreicht werden, mit den Engelkurven, die durch einen Nutzenmaximierungsansatz erreicht werden. Engel Kurven beschreiben die Nachfrage nach einem Gut in Abhängigkeit des Einkommens. Die Maximierungs-Allokation des Einkommens kann als normativer Benchmark angesehen werden, der die Allokation beschreibt, die bei gegebenem Einkommen die nutzenmaximale ist. In dem Matching-Modell kann die Allokation des Einkommens von der nutzenmaximalen Allokation abweichen. Die Entscheidungen im Matching-Modell offenbaren also nicht unbedingt die "wahren" Präferenzen der Individuen, weil die Motivation zu konsumieren (das

Wollen) nicht nur durch die erwartete Wohlfahrt (das Mögen) des Konsums bestimmt wird. Kapitel 6 benutzt die sich ergebenden Diskrepanzen zwischen Wollen und Mögen für eine Wohlfahrtsanalyse. Der Vergleich der Matching-Allokation des Einkommens mit der nutzenmaximierenden Allokation zeigt, dass beide Entscheidungsmechanismen zu relativ ähnlichen Allokationen führen. Allerdings zeigt sich auch, dass die Auswirkungen der Abweichung von nutzenmaximalem Verhalten für ärmere Individuen größer sind als für reichere Individuen. Ärmere Individuen haben dadurch einen größeren Wohlfahrtsverlust als reichere Individuen wenn sie matchen und nicht maximieren. Daraus folgt, dass die Ungleichheit gemessen in Wohlfahrt größer sein kann als die Ungleichheit gemessen in Einkommen, was Implikationen für redistributive Politikmaßnahmen hat.

Da Innovationen eine wichtige Rolle in der langfristigen Entwicklung von Konsumausgaben spielen, analysiert Kapitel 6 auch die Effekte einer bestimmten Innovation im Nahrungsmittelsektor auf die Verteilung von Einkommen und die Wohlfahrt der Individuen. Diese Innovation fügt dem Nahrungsmittel eine symbolische Komponente hinzu, so dass nun auch das Nahrungsmittel benutzt werden kann um (eine andere Art von) Status zu repräsentieren. Nahrungsmittel werden nun also aufgrund von zwei verschiedenen Bedürfnissen konsumiert. Kapitel 6 zeigt, dass bei jedem gegebenen Einkommenslevel diese Innovation den Konsum von Nahrungsmitteln erhöht und den Konsum des Statusgutes verringert. Außerdem zeigt das Kapitel, dass der Wohlfahrtsverlust besonders der ärmeren Individuen durch die Innovation größer wird als es ohne die Innovation der Fall wäre. Das Kapitel legt also nahe, dass Innovationen nicht nur rein positiv betrachtet werden sollten, sondern durchaus auch negative Folgen haben können. Solch eine Analyse ist nicht möglich, wenn man die Analyse des langfristigen Konsumverhaltens auf neoklassische oder verhaltensökonomische Ansätze beschränkt. Kapitel 6 liefert also ein Beispiel für einen Fall in dem die Bedürfnis-basierte Erklärung von Präferenzen über das hinaus geht was andere Ansätze leisten können.

Kapitel 7 schließt mit einer Zusammenfassung der Ergebnisse und einigen normativen Implikationen ab.

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1 Introduction

Recent decades have seen a strong increase in efforts by economists and psychologists to engage in interdisciplinary collaborations.¹ Behavioral economics has become so successful that some authors even consider it to be an integral part of mainstream economics. The rise of behavioral economics is likely to be a result of the increased open-mindedness of both economists and psychologists to engage in interdisciplinary research. With regard to this open-mindedness, the perspective taken in this dissertation resembles that of behavioral economics. However, there are also major differences between the perspective taken in this dissertation and the behavioral economic perspective. In a nutshell, the main difference is that while behavioral economics mostly integrates ideas and insights from cognitive psychology (Angner and Loewenstein, 2012), this dissertation uses insights mainly from motivational psychology, biology, and neuroscience to enrich economic thinking.

More precisely, the dissertation emphasizes that parts of the motivational foundations of consumer behavior can be understood in terms of the need-based framework suggested by Witt (2001). Witt argues that much of human behavior is directly or indirectly related to a finite set of basic innate needs that have evolved in times of severe selection pressure and hence can be considered to be human universals. For economics, the main advantage of this framework is that preferences become partly objective. At least to the extent that behavior is driven by these innate needs, one can explain where preferences to consume come from. Behavioral and neoclassical economics, to the contrary, cannot say much about what constitutes human preferences. While neoclassical economics assumes that preferences are solely subjective, behavioral economic research on preferences is restricted to a specific set of preferences, namely time preferences, risk preferences, and social preferences. Notwithstanding this major difference, the chapters included in this dissertation are at least partly addressed to behavioral economists because I hope to find the least rejection in this community.²

¹For detailed overviews see Rabin (1998), Angner and Loewenstein (2012), DellaVigna (2009), Fetchenhauer et al. (2011), and Kahneman (2011).

²One has to acknowledge that interdisciplinary research between economists and psychologists is not without problems. For example, communication between both disciplines is sometimes difficult because neither economists nor psychologists tend to know a lot about the other discipline (Fetchenhauer et al., 2011). Since acquiring this knowledge demands

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Most research in behavioral economics tends to apply cognitive psychology to the realms of judgement and economic decision making. However, recent developments show that the ties between behavioral economics and cognitive psychology are becoming weaker (Angner and Loewenstein, 2012). With increasing frequency, insights from other subfields of psychology are integrated and new subfields in behavioral economics emerge. According to Angner and Loewenstein (2012), recent developments in behavioral economics include (1) the rise of neuroeconomics and the related belief that human behavior is well-approximated by dual-process models,³ (2) the increasing role of affect in economic decision making, and (3) the engagement of behavioral economists in welfare economics and the presentation of policy implications⁴.

With regard to these developments in behavioral economics, this dissertation pursues three main goals. The first, relatively general goal is to suggest and provoke new ways of interdisciplinary research on the edge of economics and psychology. Thereby, the dissertation aims at contributing to the growing fields of behavioral economics and economic psychology. The second aim is to show that the need-based approach which understands individual motivation to consume as being driven by need deprivation states can support behavioral economics and in particular the recent developments within behavioral economics. The third aim of this dissertation is to show that for some economically relevant questions, the need-based approach has better answers than behavioral economics and neoclassical economics have.

Chapter 2 discusses some strengths and weaknesses of neoclassical economics, behavioral economics, and the need-based approach supported in this dissertation. In particular, the chapter discusses some difficulties, such as communication problems, that oftentimes arise in collaborations between economists and psychologists. With an awareness of these difficulties, the

a lot of effort, the barriers to interdisciplinary research are quite high. Therefore, I chose behavioral economists (and economic psychologists) who are already committed to the interdisciplinary agenda to be the addressees of this research. It is unlikely that the ideas suggested in this dissertation appeal to traditional, that is neoclassical, economists.

³Dual process models have become particularly relevant in the last few years as evidenced by Kahneman's (2011) book interpreting his research through the lens of dual-process theories and the recent special issue on dual process models in the *Journal of Economic Psychology* edited by the psychologist Fritz Strack and the economist Carlos Alos-Ferrer. Moreover, Fetchenhauer et al. (2011) identify the insight that this dual process model is a good approximation for human behavior as one of the key insights that were recently integrated from psychology into economics.

⁴Under the label libertarian paternalism behavioral economists have begun to draw policy implications from their findings. Thaler and Sunstein's (2008) book *Nudge: Improving decisions about health, wealth, and happiness* is so influential that in the US and the UK libertarian paternalism has already generated considerable attention by leading politicians.

chapter aims at showing how interdisciplinary collaborations can, nonetheless, be successful. The chapter focuses on interdisciplinary research in the realm of preference change. It distinguishes between context-dependent preference change and shifting preferences. While the former type of preference change can happen quickly depending on the decision making context, the latter type of preference change is slower and more lasting. The chapter shows that neoclassical approaches are not well-suited to explain any of the two types of preference change. In neoclassical economics, individuals are assumed to be rational actors with stable preferences. Moreover, if these preferences were not stable, neoclassical economics could not say anything about their change because preferences are assumed to be purely subjective. Behavioral economics abandons neoclassical assumptions such as rationality and perfect self-control and thus is able to explain a good deal of unstable preferences whose instability is the result of changing contextual factors. Moreover, socio-economic approaches and evolutionary economic approaches, which can be subsumed under the need-based framework by Witt (2001), abandon the neoclassical assumption that preferences are solely subjective. Thereby these approaches can at least to a certain degree explain how and why preferences shift slowly and lastingly over time.

Most of the research at the edge of economics and psychology deals with the first type of preference change, i.e. with preferences influenced by situational factors. As an exemplary case, the way behavioral economists deal with context-dependent preferences in the realm of intertemporal choice is presented. In chapter 2, however, I suggest to devote more attention to shifting preferences. Shifting preferences can, for example, explain why consumer behavior in the last hundred years changed the way it did. During this time, individual income rose by approximately the factor 5. Driven by this rise in income, individuals changed the allocation of their income to various expenditure categories. For example, whereas the expenditure shares devoted to food consumption decreased with rising income in most economies and time periods (Deaton and Muellbauer, 1980), the expenditure shares devoted to entertainment devices, status goods, and generally symbolic consumption activities rose (Ariely and Norton, 2009). Neither neoclassical economics nor behavioral economics can explain these dynamics. As described in chapter 2 (and more formally in chapter 6), the need-based approach can explain such preference shifts at least to a certain extent. Thus, I present how psychological insights can be integrated into economics in order to explain how preferences shift over time.

Although context-dependent preference changes and shifting preferences are different economic phenomena, the chapter shows that both types of integrating psychological insights into economics can benefit from each other. Behav-

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ioral economics, for example, is likely to benefit from a motivational perspective that helps to understand why the deviations from rational benchmarks are stronger in some domains than in others, and in which domains these deviations are likely to become bigger over time. The chapter suggests that future research should put more emphasis on motivational aspects of human behavior to complement the decision-theoretic focus of the research conducted in behavioral economics.

Since communication problems between economists and psychologists are likely to emerge when they engage in collaborative efforts (see chapter 2), in *chapter 3*, I present some psychological theories that will become important in chapter 5. More particularly, chapter 3 summarizes research in psychology and sociology that deals with the answers that individuals give to themselves when they ask the question “Who am I?”. The answers to this question constitute the individuals’ self-images or their identities. Images that individuals have of themselves have received a great deal of attention in psychology and other social sciences, and with increasing frequency the argument that individuals care about their self-images is also used in economics.

In line with the motivational focus of the whole dissertation, chapter 3 presents the most common identity-related needs oftentimes called self-image motives found in the psychological literature. Highlighting the roles played by these self-image motives, the chapter presents a (by no means complete) overview of psychological and sociological theories that might be (or actually were) incorporated into economic frameworks. Additionally, the chapter shows and discusses how some of the theories are already integrated into economics. For example, the best known integration of social self-image considerations into economics by Akerlof and Kranton (2000) is presented and discussed. In the discussion it is argued that Akerlof and Kranton neglect the basic psychological insight that the self-image is a complex and dynamic construct so that their analysis is at best a partial one dealing with a given social self-image at a given time. Moreover, in economics the psychological concept of the self-image is sometimes used in an inaccurate way. For example, sometimes the notion of the self (not the image of the self) is mixed with the notion of the self-image. By presenting this rather rough overview, the major aim of chapter 3 is to provoke more thoughts about, and future research on, the roles that self-images play in economically significant situations.

Chapter 4 applies the need-based, motivational perspective to research in intertemporal choice and impulsive consumption. More specifically, the chapter presents a new intertemporal choice model. This model is a modification of Laibson’s (1997) quasi-hyperbolic discounting model and adopts the perspective that human behavior is guided by two decision making systems called System 1 and System 2 (Kahneman, 2011). By assuming that decisions

between two future outcomes are guided by the reflective decision making System 2 alone, while intertemporal decisions with an immediate outcome in the choice set are additionally influenced by the impulsive decision making System 1, this model can explain dynamic inconsistencies of time preferences (Berns et al., 2007; Laibson, 1997; Strack et al., 2006). That is, the model can explain why individuals oftentimes are patient when making plans for the future (System 2 processing) but impatient when the potential consumption act approaches immediacy (System 1 processing). For example, individuals driven by System 2 plan to eat healthy but succumb to the urge to eat fast food that arises in System 1 when they are hungry and fast food is easily obtainable. Recent neuroimaging studies support that intertemporal decisions are influenced by two separated processes. These studies find that when an immediate reward is in an intertemporal choice set, different brain areas are active than when an intertemporal decision is made for two rewards both obtainable only in the future (McClure et al., 2007, 2004). More precisely, the brain area that is identified to correspond to immediately obtainable rewards is the dopamine-related mesolimbic system.

However, as identified in section 4, recent work on the quasi-hyperbolic discounting model is not very detailed about the characteristics of the urges that lead to choices of smaller sooner rewards instead of larger later ones. Usually it is simply assumed that System 1 is myopic and values immediate gratification more strongly than System 2 does. Also the role that the mesolimbic dopamine system plays when immediate rewards are in the choice set is not specified any further. To get to the bottom of this myopic desire, i.e. to understand the motivational foundation of impulsive behavior, chapter 4 utilizes recent neuroscientific findings suggesting that reward can be dissociated into ‘wanting’ and ‘liking’ components (Berridge, 1999; Berridge and Aldridge, 2008). Berridge and colleagues investigate the neural correlates of reward and find that reward ‘wanting’ and reward ‘liking’ occur at different areas in the brain.⁵ Therefore it is possible that individuals ‘want’ rewards to a higher degree than they ‘like’ them, and vice versa, ‘like’ rewards more than they ‘want’ them. Although consciously, i.e. within System 2, wanting and liking almost always cohere, the unconscious core process of the motivation to pursue a reward (‘wanting’) and the core process of hedonic pleasure (‘liking’) can become dissociated, so that ‘wanting’–‘liking’ gaps occur in System 1. To dissociate ‘wanting’ from ‘liking’ the dopamine-related mesolimbic brain system (which was also related to impulsive choices of System 1 in the

⁵‘Liking’ is caused only in a number of hedonic hotspots in brain structures such as the nucleus accumbens or the posterior half of the ventral palladium (Peciña et al., 2006). Compared to these hedonic hotspots, ‘wanting’ mechanisms in the brain are more numerous and diverse.

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studies by McClure et al. (2007, 2004)) has proven to be particularly useful (Berridge, 2007). More precisely, Berridge and colleagues find that the mesolimbic dopamine system codes ‘wanting’, i.e. the motivation to pursue rewards, rather ‘liking’, i.e. how pleasurable rewards are perceived.

One specific type of ‘wanting’–‘liking’ dissociation that Berridge and colleagues identify is the result of cue-triggered ‘wanting’ (Berridge and Aldridge, 2008; Wyvell and Berridge, 2001). Cue-triggered ‘wanting’ can explain why some immediately available, cued rewards are strongly ‘wanted’ although they are not necessarily ‘liked’. One condition for cue-triggered ‘wanting’ to occur is that the mesolimbic dopamine system is activated. In humans, strong need deprivation states such as hunger, drug craving, and sexual deprivation, as well as many emotional and stressful situations correspond to activation in the mesolimbic brain system (Berridge, 2002; Berridge and Aldridge, 2008). Besides a cue and a need deprivation state, another condition for cue-triggered ‘wanting’ is the existence of consumer knowledge containing the knowledge that the current need deprivation state can be reduced by the immediately available, cued reward. If not controlled by cognitive efforts, cue-triggered ‘wanting’ can induce impulsive choices of smaller sooner rewards instead of larger later ones, although the latter are ‘liked’ more.

Chapter 4 formalizes the cue-triggered ‘wanting’ mechanism and integrates it into the quasi-hyperbolic discounting model. More precisely, in the new model, called the incentive salience model of intertemporal choice, the impact of the myopic System 1 is described by the cue-triggered ‘wanting’ mechanism. The incentive salience model offers explanations for existing phenomena in intertemporal decisions that are difficult to be explained by many behavioral economic concepts (present-biased preferences, domain effects, magnitude effects). Additionally, the model provides new hypotheses that can be tested mainly in experiments in future research. It suggests to observe need deprivation states, consumer knowledge, cues, and (lack of) self-control to use these observations to experimentally test predictions regarding impulsivity made by the incentive salience model.

Since, a necessary condition for the occurrence of cue-triggered ‘wanting’ is a need-deprivation state, this explanation fits quite well to the general need-based perspective taken in this dissertation. Moreover, it relates strongly to recent developments in behavioral economics. It shows how the need-based view, combined with recent neuroscientific insights, can help to understand why System 1 is myopic and heavily values the present. Moreover, since it is increased ‘wanting’ rather than increased ‘liking’ that induces myopic behavior, the chapter suggests that it is not affect that leads to deviations from rational behavior but rather strong motivational urges that can, but do not have to, correspond to affect.

Chapter 5 is closely related to chapter 4. Chapter 5 also deals with impulsive consumption and highlights the roles that cognitive and motivational aspects of reflexive thought (namely self-control and self-image motives, respectively) play in intertemporal decisions. While self-control can inhibit individuals from consuming impulsively (Baumeister, 2002), self-image motives can induce impulsive consumption (Dittmar and Bond, 2010). The chapter shows that the focus of behavioral economics is mostly on the cognitive aspects of reflexive thought, i.e. on the exertion of self-control in System 2. For example, behavioral economics dealing with intertemporal choice highlights the roles that self-control devices play for economically relevant problems (Bryan et al., 2010).

Chapter 5 goes beyond that in arguing that also motivational aspects of reflexive thought, i.e. self-image motives, play a role in impulsive consumption. More precisely, chapter 5 suggests that self-image motives can partly explain why the intuitive System 1 is myopic and strives for immediate gratification so that self-control becomes an issue in the first place. Only by investigating the impulsive System 1, the chapter argues, one can understand why impulsive decisions occur in some domains (for example in identity-relevant domains such as clothes) but not in other domains (such as basic body care). Highlighting the role that self-image motives play in intertemporal decisions is in line with the need-based, motivational approach suggested in this dissertation. Since recent behavioral economic research on impulsive consumption focuses on the mitigating effects of self-control, chapter 5 suggests a change in focus from the factors that inhibit impulsive consumption to the factors that induce impulsive urges in the first place.

To explain how self-image motives can lead to urges to consume identity-relevant goods, chapter 5 suggests that self-image motives can induce impulsive consumption via the cue-triggered ‘wanting’ mechanism introduced in chapter 4. The chapter argues that since self-image discrepancies are psychologically stressful, they can activate the brain’s mesolimbic dopamine system. Hence, cues indicating the immediate availability of identity-related goods that are able to reduce the self-image discrepancies can trigger strong urges to ‘want’ these identity-related goods, although the goods are not necessarily ‘liked’ to the same extent as they are ‘wanted’. This may explain the regret many individuals perceive only a few hours after they bought products such as clothes on impulse.

Based on the knowledge of the cue-triggered ‘wanting’ mechanism, especially in context of identity-related consumption, the chapter presents implications for libertarian paternalistic policy advice. Libertarian paternalism refers to policy interventions that change the context (in libertarian paternalistic terms, the choice architecture) in which individuals make decisions so that

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individuals are nudged to behave in their own best self-interests but maintain their freedom of choice (Thaler and Sunstein, 2008). In the case of impulsive consumption, one good candidate for a behavior that is not in the best interest of an individual is a behavior that is characterized by a ‘wanting’–‘liking’ dissociation. Accordingly, a policy intervention impacting impulsive behavior can be called libertarian paternalistic when it tries to reduce ‘wanting’–‘liking’ dissociations without reducing the individuals’ freedom to choose every good they ‘want’, even though they might not ‘like’ it.

On the one hand, chapter 5 offers a note of caution for those libertarian paternalistic policies that are applied by third parties to populations composed of individuals with diverse self-images. More precisely, the chapter argues that self-nudges (i.e. System 2 nudges System 1) should be preferred to nudges by third parties, because the subjective character of self-images makes it difficult for third parties to judge what makes individuals better off. On the other hand, the chapter shows how taking the motivational perspective on impulsive consumption can generate new nudging strategies. These are presented in the context of ethical consumption. The chapter illustrates how nudges can be used to either reduce unnecessary impulsive consumption or increase the frequency with which ethical goods are impulsively consumed. Essentially, three strategies through which choice architects (third parties, but preferably the individuals themselves) can nudge individuals towards an ethical way of impulsive consumption are distinguished: Increasing willpower to guard against unethical impulses, reducing the occurrence of unethical impulses, and guiding impulsive consumption to ethical directions by making salient certain, ethical self-images. While the first strategy, i.e. increasing willpower, is also suggested by behavioral economists (Bryan et al., 2010), the second and the third strategy, i.e. reducing and guiding impulsive urges, emerge only as the result of taking the motivational, need-based perspective. Hence, the need-based perspective taken in this dissertation can support the recent attempts by behavioral economists to engage in welfare economics and present policy implications.

Chapter 6 does not deal with impulsive consumption anymore, but rather presents a formal model of Witt’s (2001) need-based framework explaining the changes in consumer behavior over the long run. Over the last decades, consumer behavior, measured in terms of the allocation of income to various consumption categories, has changed enormously (Deaton and Muellbauer, 1980). Driven by a rise of their disposable income, individuals today spend a much smaller fraction of their income on necessities such as food but a much higher fraction on luxuries such as status goods and recreational activities. The empirical regularity that expenditure shares devoted to food consumption decrease with rising income was first shown by Ernst Engel and is so strong

that it is referred to as Engel's Law (Engel, 1857). Although there is ample empirical evidence for such structural change on the demand side (Banks et al., 1997; Deaton and Muellbauer, 1980), in economics there are almost no theoretical models that can explain, rather than solely describe, these empirical findings.

However, by understanding preferences as being closely related to needs, at least to a certain degree one can understand the long-run change of consumer behavior in the recent decades. Following Witt (2001), chapter 6 argues that different needs are characterized by different satiation dynamics, i.e. some needs (for example the need to eat) are easier to be satiated than others (such as the needs for social status, entertainment, and positive self-images). This has strong implications for consumer behavior at the macro level. With rising income, those needs that are easy to be satiated loose expenditure shares, because since they are almost satiated, they do not generate additional consumption anymore. Needs that are difficult to be satiated, to the contrary, gain expenditure shares, because deprivation states are still present even if income is high enough to satiate some other needs. Accordingly, the need-based perspective can help answering the question *why* some goods are necessities (whose expenditure shares decrease with rising income) and other goods are luxuries (whose expenditure shares increase with rising income), instead of being reliant upon empirical ad hoc findings.

In the model presented in chapter 6, individuals allocate their income according to a decision making process that is inspired by Herrnstein et al.'s (1997) matching law. More precisely, individuals allocate their income in such a way that the income devoted to the various consumption categories is proportional to the need deprivation states that correspond to the various consumption categories. For illustrative purposes, the chapter presents the dynamics of a growing economy in which only two consumption goods, namely food and status symbols, and respectively two consumer needs, namely the needs for nutrition and social adoration, exist. The difference between the two needs is that while the need for nutrition has a stable satiation point, the satiation point of the need to signal social status increases with income. Hence, the need for social status is more difficult to be satiated than the need for nutrition. Consistent with empirical findings (Deaton and Muellbauer, 1980), the model shows that with rising income, expenditure shares for goods corresponding to needs that are easy to be satiated decrease, and expenditure shares for goods corresponding to needs that are difficult to be satiated increase. Moreover, the model is able to reconstruct the empiric regularity that income elasticities for food decline with rising income (Blundell et al., 1993). Traditional utility maximization models have great difficulties to reconstruct this finding. Accordingly, chapter 6 shows that based on assumptions about

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differential satiation patterns of different needs, a simple mathematical model can explain the changing allocation of income when individuals get richer.

Moreover, the chapter compares the Engel curves obtained from matching with the Engel curves obtained from a traditional constrained maximization approach. The latter can be interpreted as the normative benchmark depicting the utility that is obtainable from a given income when individuals allocate their income in an optimal way. Since in the matching model, individuals do not necessarily allocate their income in an optimal way, individual choices do not necessarily reveal the individuals' "true" preferences. It is thus possible that the motivational component of utility (wanting) differs from the well-being component of utility (liking). These differences are important for a welfare analysis. Chapter 6 shows that for relatively rich individuals, matching and maximization generate similar curvatures of Engel curves. Hence, even if one assumed that individuals actually match their expenditures in the real world, maximization is a not too bad approximation for the change of consumer behavior when income is already relatively high and keeps on increasing. However, also differences between Engel curves obtained from utility maximization and the matching law are obvious: When relatively poor individuals match, they spend more on status goods and less on food than it is optimal. The deviations from rational behavior are thus larger for poor individuals than for rich individuals, so that relatively poor individuals have a higher welfare loss from deviating from rational behavior than richer individuals have. The inequality in terms of welfare can thus be stronger than the inequality in terms of income. This can have implications for redistributive policy interventions.

As innovations play an important role in influencing satiation patterns, the chapter also investigates the effects that one particular type of innovation has on Engel curves and individual well-being. This innovation adds an additional symbolic component to the food product. Due to this symbolic component, also food can be used to signal social status so that another motivation to consume food is added. The chapter shows that at any given income level, this innovation increases the consumption of food and decreases the consumption of other status symbols. Moreover, it is shown that the welfare loss, especially for the poor, is higher in the economy with the innovation than it is in the economy without the innovation. Hence, chapter 6 argues that innovations should not be seen as solely beneficial.

Chapter 6 analyzes long-run changes of consumer behavior in a way that is distinct from the analyses in neoclassical economics and behavioral economics. The chapter integrates insights from biology and motivational psychology about the satiation dynamics of various needs. Moreover, the chapter uses a decision making mechanism inspired from research in behavioral

psychology to formalize individual consumer behavior. The chapter shows that using insights from these disciplines can answer questions that are beyond the questions asked in neoclassical economics and behavioral economics. This holds particularly true when one is interested in the long-run changes of consumer behavior. Thus, chapter 6 can be seen as a step towards more interdisciplinary research on the edge of economics and (not only cognitive) psychology.

2 Changing preferences – What can economics learn from psychology, and how?

2.1 Introduction

Since the last two or three decades, research on the edge of economics and psychology has grown to a large extent. Evidence for the success of this interdisciplinary research agenda includes the Nobel price in economics awarded to the psychologist Daniel Kahneman, the foundation of the International Association for Research in Economic Psychology (IAREP) and the Society for the Advancement of Behavioral Economics (SABE), and the success of interdisciplinary journals such as the Journal of Economic Psychology and the Journal of Socio-Economics (Hoelzl and Kirchler, 2011). However, although there is an increasing desire to engage in more collaborative activities, dialogue between the two fields remains in its infancy (Ariely and Norton, 2007). Several obstacles still stand in the way for interdisciplinary activities. For example, while economists value mathematical precision and logic more than realism, in psychology this is reversed so that oftentimes communication problems between researchers from the two fields emerge (Fetchenhauer et al., 2011). To generate successful interdisciplinary research, these obstacles have to be identified and, if possible, removed.

Acknowledging that such difficulties may arise, this chapter outlines two ways how economists can, nevertheless, make use of psychological insights to enrich economic thinking. More precisely, the chapter shows how psychological insights can help explain two types of preference changes. On the one hand, preferences are influenced by contextual factors. When these contextual factors change, preferences change accordingly. This chapter will call this rather rapid and short-lasting type of preference change *context-dependent* preference change. On the other hand, preferences can change slowly and more lastingly when individuals learn new preferences or when the weights of different alternatives change over time. This second type of preference change will be called *shifting* preferences. The traditional economic framework of rational utility maximization of subjective preferences is not well-equipped to explain changing preferences of any of the two types, because (1) rational

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individuals' preferences do not change (Stigler and Becker, 1977), and (2) if they would change, one could not say anything about it, because preferences are purely subjective (Friedman, 1962; Samuelson, 1937). Integrating insights from psychology, though, is one promising way to enhance economics' ability to explain preference change.

A way to come closer to an explanation of changing preferences is to abandon psychologically insupportable, but in traditional economics well established, assumptions. To understand why preferences change depending on the context, the assumptions of rationality, perfect self-control, and solely selfish behavior were quite successfully abandoned by behavioral economists (e.g. Camerer, 2004). By substituting these assumptions with insights from cognitive psychology, behavioral economists could show that in various situations, individuals deviate from behavior that traditional economists would call rational (Ariely, 2009; Kahneman, 2011; Lewis, 2008). Socio-economic approaches and evolutionary economic approaches have taken a slightly different road. These approaches focus on abandoning the assumption that preferences are solely subjective to explain why preferences slowly and lastingly shift over time (Witt, 2001). Integrating insights from social psychology, motivational psychology, and biology, these approaches acknowledge that individual preferences are determined by social contexts and the desire to satisfy needs. Accordingly, preferences are not solely subjective anymore, but become partly objectified knowledge. Most of the research at the edge of economics and psychology, however, deals with the first type of preference change, i.e. with preferences influenced by situational factors. This chapter aims at drawing attention to the second way of integrating psychological insights to explain shifting preferences. Although both ways of integration are different from each other and ask different questions, the chapter argues that they can support each other to obtain more comprehensive insights of psychological effects on preference change.

The chapter proceeds as follows: Section 2.2 presents some difficulties that arise when economists and psychologists collaborate. Especially, communication problems are likely to come up and have to be solved before collaboration becomes beneficial for both sides. Section 2.2 thus presents some ways *how* economics can learn from psychology. The following sections investigate *what* economists can learn, and have already learned, from psychology to explain changing preferences. Section 2.3 presents some research that uses cognitive psychological insights to explain context-depending preference changes. As an exemplary case, the way behavioral economists deal with context-dependent preferences in the realm of intertemporal choice is presented. Section 2.4 deals with shifting preferences and shows how abandoning the assumption that preferences are purely subjective can help explaining such preference shifts. The

section presents Witt's (2001) integrative framework that explains shifting preferences on the basis of a need-based understanding of human behavior inspired by motivational psychology and biology. To show that such an approach can be translated into the language of economics, i.e. into math, a simple formal model is presented. The last section concludes by showing how both approaches can benefit from each other.

2.2 Communication between economists and psychologists

Collaborations between economists and psychologists can provide benefits for both sides. However, to make such collaborations successful, some obstacles in the way have to be removed. For example, economists and psychologists speak different languages, and communication between the two types of research is still in its infancy (Ariely and Norton, 2007). To solve such communication problems it is necessary to understand where the major differences between the two disciplines lie. One important difference between economics and psychology is that both disciplines have essentially different aims. While for psychologists, understanding all facets of human behavior is a goal in itself, economists are not primarily interested in why humans behave in the way they do. Economists are rather interested in the outcomes of human behavior, i.e. they want to investigate phenomena in economically significant situations especially on marketplaces. To explain many of these phenomena it is oftentimes sufficient to have a rather superficial approximation of human behavior that no psychologist would support. Accordingly, traditional economists approximate individual behavior by assuming that individuals rationally maximize their utility defined by their subjective and constant preferences. Since in the traditional economic world, individuals are rational, their constant preferences are revealed by their choices so that no underlying concept is needed to understand what individuals have preferences for.¹

The main advantage of this framework is that it allows economists to use relatively simple mathematical models to formalize human behavior – and, in contrast to psychologists, math is the dominant language that economists use. Using equations instead of words reduces the scope for imprecise inter-

¹To be fair though, many traditional economists do not really believe that humans are always rational. They do, however, believe that rational utility maximization is a good-enough approximation of human behavior. Consequently, their formal models utilize the maximization calculus. From these models, however, (policy-) implications are deduced. When human behavior is too different from the approximation of rational utility maximization, this can become problematic.

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pretation to a minimum, and economically relevant situations can be analyzed with high inherent precision and logic. This focus on mathematical formulation, however, is an important reason for communication problems between economists and psychologists. The economic way to approach research questions extensively relying on mathematical formalizations might be somewhat disturbing for psychologists who put more value on realistic assumptions than on mathematical precision and logic within the framework.² Accordingly, the possibility to translate behavior into equations, which is usually seen as an advantage of the concept of rational utility maximization, may be a disadvantage when economists and psychologists engage in collaborative efforts.

A second disadvantage of the traditional economic view on human behavior is that this view is, from a psychological perspective, wrong. Some economic subdisciplines, such as behavioral economics and evolutionary economics, take such insights from neighboring disciplines more serious than traditional economists do and depart from traditional economic assumptions. While behavioral economics mainly criticizes that the traditional economic framework is not able to explain decision making that deviates from the rational benchmarks of utility maximization, evolutionary approaches to economic behavior deal with the preferences that underly economic decisions and provide need-based explanations how preferences are formed. However, both subdisciplines still have to speak the language of economics, i.e. formulate their ideas mainly in mathematical terms, to be accepted by their economic colleagues in mainstream economics. In the hope to successfully integrate psychological theories into an economic framework that is competitively viable on the market of economic theories, behavioral and evolutionary economists tend to search for *the* overarching theory in psychology that could generate axioms of choice and be translated into mathematical equations. Unfortunately for these economists, however, there is not a single theory in psychology that could substitute the rational utility maximization framework. Rather, in psychology a large number of theories can be found that explain human behavior in specific situations case by case. Since psychologists aim at accurately understanding human behavior in all its facets, for them it is not sensible to translate human behavior in relatively general models that can be formalized using mathematical equations.

Accordingly, non-traditional economists face a dilemma. While they have to formulate their ideas in mathematical terms to be accepted within (mainstream) economics, this formulation impedes communication with other dis-

²Actually, the obsessive use of math as a signal to show one's mathematical ability without much scientific benefit has become object of harsh criticism even from within economics.

2.3 Context-dependent preferences

ciplines from which these economists want to borrow insights. Recently, a group of leading scholars in the fields of economic psychology and behavioral economics discussed the relationship between economics and psychology (Fetchenhauer et al., 2011). They argued that

“contrary to psychology, in behavioral economics some scholars (...) develop theoretical models of how people behave given what we know about the limitations of humans’ rationality. Alas, such modeling is often neither understood nor appreciated by psychologists” (p.696).

The extensive use of math by economists on the one hand, and the lack of a unifying theory in psychology on the other hand are two reasons for a lack of communication between the two disciplines. There are still only few economists who truly use psychological insights for their theories and there are only few psychologists who express their ideas in mathematical terms (Fetchenhauer et al., 2011). Without such attempts, however, communication between the two disciplines will keep on being disturbed and the knowledge of the other discipline will keep on being limited (Hoelzl and Kirchler, 2011). Hence, on the one hand, interdisciplinary research demands integration of psychological ideas into mathematical formulations that are easy enough to be understood by researchers without an economic background. On the other hand, interdisciplinary research needs efforts by psychologists to simplify and broaden their theories so that these can be applied to more than single very specific situations.

2.3 Context-dependent preferences: Insights from cognitive psychology

The traditional economic framework does not put much emphasis on contextual factors that affect human decision making. Only to the extent that constraints to behavior are affected, contextual factors change behavior is this model. However, as psychologists know, individuals hardly ever make decisions without their preferences being influenced by contextual factors. One major task of social psychology is to understand how different contexts impact behavior in the world, and what the essential elements of those contexts are (Ariely and Norton, 2007). Research in behavioral economics has shown various instances where economically relevant behavior changes with changing contexts. For example, preferences for money are stronger when the money is framed as a loss, instead of a gain (Kahneman et al., 1990). When individuals are asked to guess the percentage of African nations that are members

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of the United Nations, their answers are influenced by obviously independent events such as the outcome of a spin on a wheel of fortune (Tversky and Kahneman, 1974). When individuals who have the choice between immediately obtaining a healthy or an unhealthy snack are hungry, they tend to choose the unhealthy snack more often than individuals who are not hungry (Read and Van Leeuwen, 1998). When individuals are cognitively exhausted, they tend to favor chocolate cakes over healthy fruit salads (Shiv and Fedorikhin, 1999). When individuals make plans for the future, they are much more patient than when the future approaches immediacy (Frederick et al., 2002).³

Integrating psychological insights into economic models can help to explain such contextual influences on preferences. Some economic approaches integrate psychological factors into otherwise standard economic models. That is, these approaches stick to the traditional assumptions of rational individuals who maximize their utility. George Akerlof is known as being particularly successful in this endeavor. For example, together with Rachel Kranton he integrated the social psychological concept of social identity into the standard economic utility function. Thereby they explain many social and economic phenomena while sticking to the traditional economic strategy of utility maximization under given constraints (Akerlof and Kranton, 2000). For example, they explain gender-based segregation in the workforce and the high rates of dropout from school among African Americans. This way of integrating psychological insights into economics has the advantage that since economists can stick to their basic assumptions of humans being rational, sophisticated beings with full information and perfect self-control, they can use their usual way of mathematical formulation with a maximization calculus.

A more drastic way of integrating psychological thinking into economics to explain many of the context-dependent preference changes mentioned above is to abandon the assumptions of ultimate rationality, perfect information, and perfect self-control. Behavioral economics has done so quite successfully by integrating insights mainly from cognitive psychology (Lewis, 2008). One prominent example of a successful integration from psychology is in the field of intertemporal choice. Behavioral economic research dealing with intertemporal choice succeeded to translate the deviations from rationality in a relatively comprehensible way into mathematical terms. In the following, the chapter will take a closer look at this specific case of successful integration of psychology into economics.

Since Samuelson (1937) presented the discounted utility model, rational behavior in intertemporal decisions is formalized by a constant discount rate

³For extensive reviews about such anomalies see, for example, Rabin (1998) and DellaVigna (2009).

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(q). Discount rates depict the rate with which future rewards are devalued per period that the individual has to wait to obtain the rewards. Since individuals usually prefer to obtain rewards earlier compared to obtaining them later on, discount rates tend to be positive. Suppose that an individual is confronted with the opportunity to obtain either a small reward immediately or a large reward later. The decision which reward to choose depends on the comparison between the subjective value of the immediately obtainable reward and the discounted value of the reward that can be obtained only later on. Accordingly, when this discount rate is very high, odds are good that the individual will choose the immediate smaller reward. When discount rates are constant as assumed in the rational model, intertemporal preferences can be formalized by exponential discounting functions. With an exponential discounting function waiting for a reward for a day from now on discounts the reward with the same discount factor ($\delta = 1/(1+q)$) than waiting for the reward for a day beginning in a month (Frederick et al., 2002). Consider that an individual obtains utility from a temporal prospect (c_t, \dots, c_T) , where c_t denotes the consumption of a given good c that takes place with certainty at time t . The utility function for this temporal prospect corresponding to exponential discounting is given by

$$U_t(c_t, \dots, c_T) = E_t \left[u(c_t) + \sum_{\tau=1}^T \delta^\tau u(c_{t+\tau}) \right], \quad (2.1)$$

where $u(c_t)$ is the utility that is obtained by consuming c_t . Hence, when an individual prefers to obtain €10 today over €11 next week, the individual also has to prefer €10 in a year over €11 in a year and one week to be accurately modeled by this discounted utility model. However, typically the share of individuals choosing the €10 today is much higher than the share of individuals choosing the €10 in a year. This indicates that at least some individuals have dynamically inconsistent preferences; these individuals are patient (low q -values) when making plans for the future but impatient (high q -values) when the potential consumption act approaches immediacy (Ainslie, 2005; Frederick et al., 2002). The discounted utility model with its constant discount rate does not account for such dynamic inconsistencies.

Along with this insight, behavioral economists largely reject the assumption of constant discount rates over time and suggest to use hyperbolic discounting models as better approximations for intertemporal choice (Ainslie, 1975; Loewenstein and Prelec, 1992). In these models the discount rates are modeled as functions that are inversely proportional to the delay (θ) so that discount rates decrease with the delay (c.f. Ainslie, 2005).⁴ By integrating the assump-

⁴A simple example for a discount function proposed by Ainslie (1975) would be $D(\theta) = 1/\theta$ and a more general one suggested by Loewenstein and Prelec (1992) $D(\theta) = 1/(1 +$

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tion that the temporal immediacy of rewards corresponds to relatively high discount rates, hyperbolic discounting models are able to explain a good part of the dynamic inconsistencies arising from myopic choices of immediately available but smaller rewards.

However, hyperbolic discounting provides only a partial account of intertemporal preferences. Numerous studies have observed factors independent of the shape of the discount function that influence the measured discount rates such that observed discount functions diverge from the benchmarks given by exponential or hyperbolic discounting. So called “anomalies” in intertemporal choice contain several contextual influences on time preferences. They include the sign effect (gains are more rapidly discounted than losses), the magnitude effect (smaller rewards are more rapidly discounted than larger rewards), and the domain effect (directly consumable rewards such as food and addictive substances are more rapidly discounted than money) (Estle et al., 2007; Frederick et al., 2002). Moreover, the sudden and strong urges that induce impulsive consumption can go beyond what could be modeled by the already myopic discount rates in hyperbolic discounting models (Frederick et al., 2002). In particular, when utilizing hyperbolic discounting, it is difficult to explain the heavily increased discount rates that occur when individuals perceive cues that are associated with rewarding consumption objects, but do not indicate increased availability or proximity of the consumption objects (Ainslie et al., 2010).

To provide explanations for intertemporal choice that go beyond exponential and hyperbolic discounting functions, with increasing frequency it is argued that intertemporal decision making is best explained by conceptualizing the individual as consisting of two distinct decision making systems. On the one hand, System 1 is affective, automatic, impulsive, heavily values the present, and is strongly influenced by situational factors. System 2, on the other hand, is characterized by analytic preferences leading to patient behavior, willpower, and cognition (Berns et al., 2007; Hoch and Loewenstein, 1991; Kahneman, 2011; Loewenstein, 1996; Strack et al., 2006). Fetscherhauer et al. (2011) identify the insight that dual process models are a good approximation for human behavior as one of the major insights that were recently integrated from psychology into economics.

The common intertemporal choice model in behavioral economics that applies a dual processing framework is Laibson’s (1997) $\beta\delta$ model. This model was first proposed by Phelps and Pollak (1968) in the context of intergen-

$\alpha\theta)^{\beta/\alpha}$. As discount rates are defined as $-D'(\theta)/D(\theta)$, the discount rates corresponding to both discount functions are $q(\theta) = 1/\theta$ and $q(\theta) = \beta/(1 + \alpha\theta)$ respectively. Both discount rates decrease with rising delay.

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erational altruism and was later adapted by Laibson to model intrapersonal dynamic conflicts. The $\beta\delta$ model suggests that individuals have two separated discounting factors, corresponding to System 1 and System 2 respectively. The $\beta\delta$ model's discount function is quasi-hyperbolic with discount factors varying discretely over time ($D(\theta) = 1, \beta\delta, \beta\delta^2, \beta\delta^3, \dots$). Practically, this discount function is a discrete variant of the hyperbolic discount function but, theoretically, it implies that there are two exponentially discounting systems guiding individuals' intertemporal decisions. Whereas the δ System 2 discounts all future rewards with a constant rate per period, System 1, reflected by the β parameter, makes a sharp distinction between immediate rewards and future rewards: when an immediate reward is in the choice set, the reward in the next period is discounted with $\beta\delta$, but when both rewards will occur at two successive periods in the future, the later reward is discounted only with δ (Laibson, 1997). The utility function corresponding to a temporal prospect (c_t, \dots, c_T) where future consumption is discounted quasi-hyperbolically is given by

$$U_t(c_t, \dots, c_T) = E_t \left[u(c_t) + \beta \sum_{\tau=1}^T \delta^\tau u(c_{t+\tau}) \right], \quad (2.2)$$

where $u(c_t)$ is the utility gained from consumption c at time t , and β and δ are discount factors both bound between 0 and 1. This model can, for example, explain how preferences change over time from preferring €11 in a year and one week over €10 in a year to preferring €10 today over €11 in a week. The decision for the €10 today is influenced by the impulsive β system in the sense that the €11 in a week are discounted relatively steeply by $\beta\delta$. The decision in the future, however, is not influenced by the impulsive decision making system and the €11 in a year and one week are only discounted by δ thus making it more likely that these €11 are chosen.

The quasi-hyperbolic discounting model has proven to be useful to explain various cases of intertemporal choice. These contain the choices between watching a highbrow or a lowbrow film (Read et al., 1999), choices between healthy and unhealthy snacks (Read and Van Leeuwen, 1998), early retirement patterns of workers (Diamond and Köszegi, 2003), contract choices in health clubs (DellaVigna and Malmendier, 2006), and preferences for deadlines in homework assessments (Ariely and Wertenbroch, 2002) (see DellaVigna (2009) for a review). Still, some caveats remain in the quasi-hyperbolic discounting model. For example, it is still difficult to give an explanation for the finding that certain rewards (clothes, food items, and addictive drugs) are more steeply discounted than other rewards (e.g. money) (Dittmar and Drury, 2000; Estle et al., 2007). To understand this selectivity, one has to understand why the β system heavily (over-) values the present. If one knew this

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mechanism, one could understand why it is stronger for some rewards than for others. In other words, a microfoundation of the β parameter is needed.

Two related lines of research that draw heavily on psychological findings and offer potential explanations for the selective existence of low β values are visceral influences (Loewenstein, 1996) and cue-contingent preferences (Laibson, 2001). Visceral influences correspond to drive states such as hunger, thirst, sexual arousal, and to some negative emotions such as exhaustion, pain, or fear for physical safety. As part of System 1, these visceral influences often overwhelm other goals stated by System 2 and thus produce short-sighted, impulsive behavior (Loewenstein, 1996, 2000). Although individuals anticipate the influence of visceral factors on their behavior, individuals tend to underappreciate the magnitude of this influence (Loewenstein et al., 2003). The theory of cue-contingent preferences (Laibson, 2001) argues that cues can increase the marginal utility of rewards associated with the cues. For example, the smell of baking cookies is argued to induce hunger in individuals who associate cookies with eating. Thus, in this framework cues that were previously associated with rewards can change the drive states the individuals are in and thus induce impulsive behavior (Berns et al., 2007).

Lades (2012)⁵ uses aspects of both theories, combines them with recent neuroscientific findings about a cue-triggered ‘wanting’ mechanism (Berridge and Aldridge, 2008), and presents an adaptation of the $\beta\delta$ model which is called the incentive salience model of intertemporal choice. In this model, a microfoundation for the β parameter is proposed. It is argued that visceral influences, corresponding to activation in the brain’s mesolimbic dopamine system, imbue reward cues with motivational incentive salience that makes the rewards highly ‘wanted’ (but not necessarily ‘liked’). Thus, the model offers one possible explanation why impulsive behavior occurs in specific contexts but not in others, i.e. why β is sometimes smaller than unity and sometimes equal to unity. For example, when an individual is hungry and food cues are present, β is likely to be lower than when the individual is not hungry. All in all, in the field of intertemporal choice, insights from neighboring disciplines were successfully integrated into economics using relatively simple mathematics with nonetheless high precision and explanatory and predictive capacity.

⁵See chapter 4 in this dissertation.

2.4 Shifting preferences: Insights from motivational psychology and biology

Besides due to changes in contextual factors, preferences can also change in a much slower and more lasting way. For example, over time individuals can learn new preferences and unlearn others. Moreover, the weights put to different alternatives can change over time. This slower but lasting way how preferences can change will be called preference shifting. Evidence for preference shifting includes the changing patterns of consumer behavior over the last hundred years. Driven by a strong rise of their disposable income, individuals changed the allocation of their income to various expenditure categories. For example, whereas the expenditure shares devoted to food consumption decreased with rising income in most economies and time periods (Engel, 1857), the expenditure shares devoted to entertainment devices, status goods, and generally symbolic consumption activities rose (Ariely and Norton, 2009).

Neither traditional economics nor behavioral economics have dealt extensively with such slowly shifting preferences. In both subdisciplines, the investigation of what motivates behavior, i.e. of preferences, is at most superficial. While behavioral economics at least deals with a limited set of preferences, namely time preferences, risk preferences, and social preferences (DellaVigna, 2009; Witt, 2012), in traditional economics, the content of preferences has not received any investigation. To the contrary, traditional economics assumes that preferences are solely subjective and thus cannot be the object of economic investigation (Friedman, 1962; Samuelson, 1937). It is assumed that since individuals rationally maximize their utility, they reveal their subjective preferences by their choices so that a theory about preferences is not needed anyway.

To obtain a more satisfying explanation of shifting consumer behavior over time, again it is useful to integrate insights from psychology and neighboring disciplines. In psychology, plenty motivational theories and whole textbooks about what drives human behavior can be found, and the knowledge from these sources can be used to understand what actually drives economic behavior. For example, socio-economic approaches contest the idea of the atomistic individual and integrate social psychological motives into economics (Davis, 2008). One such motive is the individual's desire to obtain prestige by signaling one's wealth to others (Charles et al., 2009; Frank, 1985; Heffetz, 2011; Veblen, 1899). To explain why an increasingly huge expenditure share is devoted to the consumption of status goods, these socio-economic approaches emphasize the relative character of status consumption. A signal of wealth, say an expensive car, conveys prestige only to the extent that the car is more

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prestigious than the cars owned by the individuals in one's peer group. In other words, a big car is a status symbol only to the extent that one's neighbors do not have even bigger cars. Hence, whether the need to signal one's status to others can be satisfied depends on one's own income, but also on the income of one's peer group. This relative character can lead to positional treadmills where everybody spends ever more money on status goods so that expenditure shares devoted to these prestigious products increase over time (Frank, 1985). Other researchers have integrated the social needs to demonstrate conformity with social groups (Witt, 2010) and to distance themselves from other social group. Such bandwagon- and snob-effects can lead to excessive consumption for goods, too (Leibenstein, 1950). Moreover, some authors use psychological insights to investigate predictably changing preferences due to adaptation effects or hedonic treadmills (Frederick and Loewenstein, 1999; Scitovsky, 1992). These authors argue that over time, individuals adapt to the goods they bought so that these new goods lose their hedonic value. For example, as time goes by, individuals adapt to their new television sets and these stop being entertaining. Consumers need ever new and more entertaining products to keep their need for arousal satiated (Scitovsky, 1992). Similarly, the demand for touristic adventures has changed dramatically so that today, flying several hours to exotic places may be less entertaining than a holiday at the nearby beach was some decades ago (Chai, 2011).

To organize such changes of consumer behavior in a coherent framework, Witt (2001) suggests to make use of insights from motivational psychology and biology. He argues that all human behavior is directly or indirectly related to a finite set of basic innate needs that have evolved in times of severe selection pressure. Until today, these needs constitute the basis on which preferences are built and thus determine the content of the choices we make. As a result, insights from biology and motivational psychology can be utilized to inquire more deeply into individual preferences. By taking a need-based perspective and recognizing the existence of a finite number of basic needs and their need-specific characteristics, a significant part of individual preferences can be objectified and preference change can be explained (Witt, 2001). Basic preferences (or preference patterns) can be identified in a non-arbitrary and explicable way (Vromen, 2007). This perspective is related to recent approaches within behavioral economics that understand economic behavior as being driven by hedonistic, utilitarian motives, i.e. by the enjoyment of pleasure and the avoidance of pain (Kahneman, 1999; Kahneman et al., 1997). However, with the need-based perspective, one can go a step further and investigate what the underlying motivational processes actually are that induce pleasure or pain. Witt (2001) argues that pleasure and pain are the results of changing need deprivation states, where pleasure is attributable to reductions

of need-deprivation states, and pain relates to increases of need-deprivation states (see Witt, 2001, for an overview).

To explain long-term changes of consumer behavior, the needs' various satiation dynamics play a key role. Some physiological needs, such as the needs for food or body heat, are relatively easy to be satiated, because they are characterized by homeostatic satiation patterns with almost stable satiation points. For example, it is possible to obtain enough calories to satiate one's hunger by spending a rather low amount of money a month and this amount does not change dramatically over time. Most physiological needs can be satiated by consuming the goods' functional characteristics (e.g. an apple's calories, or the shelter a warm coat can offer), instead of the goods' symbolic meanings. For other needs, such the need to signal social status and the need for positive self-images, the goods' functional values are less important. To the contrary, whether these needs can be satiated by consumption depends on the consumption goods' symbolic meanings. Partly due to the fact that symbolic meanings can change over time, these needs are not characterized by stable satiation patterns. Additionally, when satiation is defined in relative terms (as in the case of the need to signal status) or when individuals adapt to the goods they possess (as in the case of the need for arousal) satiation is relatively difficult to achieve.

The differential satiation dynamics become important for consumer behavior when income rises. With rising income, at one time or another most needs will approach their satiation points and the consumption devoted to goods satisfying these needs will grow at a much slower pace. For needs with stable satiation patterns, this will happen at lower income levels than for needs that are relatively difficult to be satiated. Since only needs that are deprived motivate consumer behavior, with rising income the income shares devoted to the satiation of needs that are difficult to be satiated will increase while other consumption goods, namely those corresponding to needs that are easy to be satiated, stop attracting additional income. Hence, using the need-based framework it can be explained why some goods are characterized by income elasticities above unity and others by income elasticities below unity. In particular, since the goods' symbolic meanings tend to be related to needs that are difficult to be satiated, this framework suggests that with rising income the goods' symbolic meanings become more important in guiding consumer behavior relative to the goods' functional values; a suggestion also supported by behavioral economists (Ariely and Norton, 2009).

To show that these ideas can be translated into the language of economics, i.e. formalized in mathematical equations, in what follows the chapter presents a very simple model that shows how different satiation patterns of different needs translate into goods having income elasticities below or above unity.

2 Changing preferences

The model is an example showing how the need-based perspective can be used to explain slowly shifting preferences. The model is kept very simple, because its only purpose is to illustrate how the integration of needs and their differential satiation dynamics into an economic context can be fruitful.⁶

Consider an economy in which only two goods can be bought. Moreover, individuals have only two needs corresponding to the two goods existing in the economy. The first need is a physiological one. It is characterized by stable satiation patterns and can be satiated by consuming the functional value of the good C_t^F . One might think of food in this case. Consumption of C_t^F increases the satiation level L_t^{PH} of the physiological need so that $L_t^{PH} = L_t^{PH}(C_t^F)$, with $\partial L_t^{PH}/\partial C_t^F > 0$. The second need is psychological in nature. This need is characterized by unstable satiation patterns and can be satiated by consuming the symbolic meanings that the good C_t^S contains. One can think of goods signaling status to others. Consumption of C_t^S increases the satiation level L_t^{PS} of the psychological need so that $L_t^{PS} = L_t^{PS}(C_t^S)$, with $\partial L_t^{PS}/\partial C_t^S > 0$.

Satiation of both needs is achieved, when the current satiation level (L_t) reaches the satiation point (P_t). Whereas the satiation point of the physiological need (P^{PH}) is stable and does not change over time, the satiation point of the psychological need (P_t^{PS}) changes over time. Such changes can have various reasons. In the case of the need to signal status, the satiation point is likely to change because social comparison groups change when one becomes richer. To keep things simple, the model assumes that the satiation point of the psychological need (P_t^{PS}) positively depends on the individuals income I_t at time t . Hence, $P_t^{PS} = P_t^{PS}(I_t)$, with $\partial P_t^{PS}/\partial I_t > 0$.⁷

In every time period individuals distribute all their income I_t to the two different types of consumption items

$$I_t = p_{F,t}C_t^F + p_{S,t}C_t^S, \quad (2.3)$$

where $p_{i,t}$ are the prizes for both goods. Hence, the model assumes that human behavior is solely driven by the desire to satiate the two needs. That is, the model captures the behavior of individuals whose income is not sufficiently high to bring all their satiation levels L_t^{PH} and L_t^{PS} to their respective satiation points P^{PH} and P_t^{PS} . When income is higher than that, the model cannot say anything about behavior. Income is assumed to increase with a

⁶The model is closely related to the model presented in Witt (2008). Moreover, it is a simple version of the model presented later in chapter 6.

⁷This formalization is not limited to the need to signal status. It also approximates well the satiation dynamics of the need for arousal where consumption made possible by income rises increases the current satiation level, but, due to adaptation effects, also the point of satiation.

constant rate ($I_t = I_{t-1} + \Delta I_t$). To model the allocation of income, the chapter borrows from research in motivational psychology and biology. In various animal studies, in which deprived animals were made to allocate their behavior to obtain reductions of their deprivation states, animals were shown to allocate their behavior according to matching principles (Herrnstein et al., 1997). These animals choose the alternatives proportional to the relative rate of reinforcements in the respective alternatives. Translated into the context of human consumer behavior, matching means that income is divided proportional to the motivational strength of the need deprivation states of each need. Much deprivation corresponds to strong motivation to consume and only little deprivation induces only weak motivation to consume in the respective category. It is assumed that at the beginning of each period where no income has been devoted to either of the goods, both satiation levels are zero ($L_t^{PH} = L_t^{PS} = 0$). The motivation to buy a good is determined by the degree of deprivation. Deprivation is defined as the difference between the satiation point $P_{i,t}$ and satiation level $L_{i,t}$ (which is zero at the beginning of the period). Let V_t^F and V_t^S depict the motivations to consume goods that satisfy the physiological need and goods that satisfy the psychological need, respectively.

$$V_t^F = f(P_t^{PH} - L_t^{PH}) \quad (2.4)$$

$$V_t^S = f(P_t^{PS}(I_t) - L_t^{PS}). \quad (2.5)$$

The ratio of V_t^F and V_t^S indicates how strong the motivation to satisfy the physiological need is in relation to the desire to satisfy the psychological need. Individuals devote the fraction $V_t^F/(V_t^F + V_t^S)$ of their income to the good that satisfies the physiological need. Accordingly, the fraction $V_t^S/(V_t^F + V_t^S)$ of their income will be spent for psychological need satisfaction.

$$p_{F,t}C_t^F = I_t \frac{V_t^F}{V_t^F + V_t^S(I_t)}, \quad (2.6)$$

$$p_{S,t}C_t^S = I_t \frac{V_t^S(I_t)}{V_t^F + V_t^S(I_t)}. \quad (2.7)$$

Consider a situation in which the individual has zero income. Assume that in this situation, the satiation point of the physiological need is higher than the satiation point of the psychological need so that $(P_t^{PH}|I_t = 0) > (P_t^{PS}|I_t = 0)$ and $V_t^F > V_t^S$. Since no consumption could be devoted to any need satiation, both satiation levels are zero ($L_t^{PH} = L_t^{PS} = 0$). Once the individual gains some income, he or she will spend the fraction $V_t^F/(V_t^F + V_t^S)$ to the good that satisfies the physiological need. As $V_t^F > V_t^S$, a rather big share of the income is devoted to physiological need satiation and the consumption

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of C_t^F increases stronger than the consumption of C_t^S does. Accordingly, the satiation level of the physiological need increases stronger than the satiation level of the psychological need so that $L_t^{PH} > L_t^{PS}$.

To describe such dynamics it is helpful to look at income elasticities of both goods. Income elasticities depict the ratio of the percentage change in demand to the percentage change in income. Hence, they measure how responsive the demand for a good is relative to changes in income. With equation (2.6) one can see that the income elasticity for C_t^F is

$$\epsilon_t^F = 1 - \frac{I_t \frac{\partial V_t^S(I_t)}{\partial I_t}}{V_t^F + V_t^S(I_t)}. \quad (2.8)$$

Since the income elasticity for C_t^F is below unity, with rising income the share of income devoted to C_t^F decreases and C_t^F is a necessity. When $I_t \frac{\partial V_t^S(I_t)}{\partial I_t} > V_t^F + V_t^S(I_t)$, C_t^F is even an inferior good and with rising income the absolute consumption of C_t^F decreases. With equation (2.7) one can see that the income elasticity for C_t^S is

$$\epsilon_t^S = 1 + \frac{I_t V_t^F \frac{\partial V_t^S(I_t)}{\partial I_t}}{(V_t^F + V_t^S(I_t)) V_t^S(I_t)}. \quad (2.9)$$

Hence, with rising income the share of income devoted to C_t^S increases and this good is a luxury.

In this simple model, differential satiation dynamics translate into empirically testable hypotheses about whether goods are necessities or luxuries. Traditional models that formalize human behavior using the rational utility maximization calculus have great difficulties explaining why income elasticities deviate from unity. Hence, the integration of the need-related insights from motivational psychology and biology into economics can help in providing answers to economic questions such as why income elasticities diverge from unity. However, one important assumption that this model makes is that all income is used to satiate needs. Hence, the model cannot capture consumer behavior when all needs are already satiated. How severe is this limitation?

$$\begin{aligned} {}^8 \epsilon_t^F &= \frac{\partial C_t^F}{\partial I_t} \cdot \frac{I_t}{C_t^F} = \frac{[V_t^F p_{F,t}(V_t^F + V_t^S(I_t)) - I_t V_t^F p_{F,t}(\partial V_t^S(I_t)/\partial I_t)] \cdot I_t \cdot p_{F,t}(V_t^F + V_t^S(I_t))}{(p_{F,t}(V_t^F + V_t^S(I_t)))^2 \cdot I_t V_t^F} = \\ &= \frac{V_t^F + V_t^S(I_t) - I_t (\partial V_t^S(I_t)/\partial I_t)}{V_t^F + V_t^S(I_t)} = 1 - \frac{I_t (\partial V_t^S(I_t)/\partial I_t)}{V_t^F + V_t^S(I_t)}. \\ {}^9 \epsilon_t^S &= \frac{[(V_t^S(I_t) + I_t (\partial V_t^S(I_t)/\partial I_t)) p_{S,t}(V_t^F + V_t^S(I_t)) - I_t V_t^S p_{S,t}(\partial V_t^S(I_t)/\partial I_t)] \cdot I_t \cdot p_{S,t}(V_t^F + V_t^S(I_t))}{(p_{S,t}(V_t^F + V_t^S(I_t)))^2 \cdot I_t V_t^S(I_t)} = \\ &= \frac{V_t^S(I_t) V_t^F + (V_t^S(I_t))^2 + I_t V_t^F (\partial V_t^S(I_t)/\partial I_t) + I_t V_t^S(I_t) (\partial V_t^S(I_t)/\partial I_t) - I_t V_t^S(I_t) \frac{\partial V_t^S(I_t)}{\partial I_t}}{(V_t^F + V_t^S(I_t)) V_t^S(I_t)} = \\ &= \frac{(V_t^F + V_t^S(I_t)) V_t^S(I_t) + I_t V_t^F (\partial V_t^S(I_t)/\partial I_t)}{(V_t^F + V_t^S(I_t)) V_t^S(I_t)} = 1 + \frac{I_t V_t^F (\partial V_t^S(I_t)/\partial I_t)}{(V_t^F + V_t^S(I_t)) V_t^S(I_t)}. \end{aligned}$$

In our artificial economy where only two needs exist it is quite likely that these two needs are satiated with a relatively low amount of income. Hence, in this economy, the limitation is quite severe. However, in the real world, there are plenty of different needs that drive consumer behavior and it is likely that for many individuals not all needs are already satiated. Accordingly, the limitation is no reason to a priori reject the usefulness of this model in favor of a utility maximization approach without further investigation.

2.5 Concluding remarks

This chapter argued that in order to explain two types of changing preferences (context-dependent preferences and shifting preferences) economists can make use of two different branches within psychology. The first branch within psychology that economists can use, and essentially have used quite extensively, is cognitive psychology. This is done mainly in behavioral economics. Behavioral economics is interested in how decisions are made and how and under what conditions these decisions diverge from rational benchmarks (Lewis, 2008, p.3). By identifying the influence of the context on individual decision making, behavioral economics can explain context-dependent changes of preferences. However, behavioral economics does not have a complete theory about the preferences on which individual decisions are based. Hence, it cannot go beyond explaining the influence of situational factors on preferences and is silent about how preferences themselves change potentially independent of situational factors. Research in behavioral economics that deals with preferences mainly focuses on risk- and time-preferences, but does not investigate what the objects are that individuals want to obtain with a given risk at a given point in time (Witt, 2012). Accordingly, behavioral economics cannot explain why preferences for certain goods increase over time while the preferences for other goods do not increase or even decrease. To explain how and why preferences shift slowly over time, the chapter suggested that economists can use insights from motivational psychology and biology as it is done partly in socio-economic and evolutionary economic approaches. By integrating motivational aspects from other disciplines into the analysis of economic decision making, economists can go beyond explaining how decisions are made. Additionally, they can explain what these decisions are made for. That is, by integrating motivational psychology and biology, it is possible to inquire into the individuals' preferences (Witt, 2012).

Although both approaches deal with different economic phenomena, it is likely that both types of integrating psychological insights into economics can benefit from each other. Behavioral economics, for example, is likely to benefit

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from a motivational perspective that may help to understand why the deviations from rational benchmarks are stronger in some domains than in others and in which domains these deviations are likely to become bigger. Moreover, there are clearly relations between both types of preference changes. Context-dependent preferences, for example, can influence the slower preference formation process. As demonstrated by Bem (1967), individuals infer their preferences from their own past behavior. When this past behavior was influenced by situational factors, these factors also have an influence on the slower type of preference shifting (Ariely and Norton, 2008). Future research should put more emphasis on motivational aspects of human behavior to complement the already elaborated decision-theoretic research conducted in behavioral economics.

3 Identity and economics: An overview

3.1 Introduction

There are many different answers to the question “Who am I?”. Individuals can define themselves according to personal characteristics, relationships, social groups, descriptively, normatively, and these definitions can change over time and situations. In psychology, the ways to answer the question are subsumed under the notions of self-image or identity (both notions will be used interchangeably in this dissertation). Images that individuals have of themselves have received a great deal of attention in psychology and other social sciences, and with increasing frequency the argument that individuals care about their self-images is also used in economics. The most known integration of self-image considerations into economics is that of Akerlof and Kranton (2000). These authors incorporate the idea that individuals care about their social identities and perceive deviations from the norms and values related to these social identities as psychologically stressful. The disutility related to the psychological stress is integrated into a traditional neoclassical utility maximization framework. However, this approach is not the only one, and this chapter reviews and discusses some of the ways how economists have made use of the neighboring disciplines’ theories related to self-images and identities. This chapter is thus a rather rough overview with the major aim of provoking more thoughts (and research) about the roles that self-images can play in economically relevant areas.

The chapter proceeds as follows: In section 3.2, a brief definition of what is meant by the notions of self-image and identity is presented. The following section 3.3 very briefly presents the most common self-image motives that can be found in the psychological literature. Section 3.4 presents a (by no means complete) overview of psychological and sociological theories that might be (or actually were) incorporated into economic frameworks. In this overview, the roles played by self-image motives are emphasized. The overview is restricted to presenting the theories and does not present the numerous empirical studies that tested the theories, because presenting these empirical studies would not be too helpful for investigating whether the existing self-image theories can be

integrated into economic theorizing. In the overview, it will become apparent that many of the presented theories are related among themselves, and it should be kept in mind that there is not necessarily a strict logical separation between the theories. The subsequent Section 3.5 shows and discusses how some of the theories have been integrated into economics. The last section concludes.

3.2 What is the self-image?

Although numerous definitions for the notions of self-image and identity can be found in the social scientific literature, in the most common usage the self-image refers to a set of mental representations about oneself.¹ The self-image declares how individuals perceive and evaluate themselves. It contains the knowledge and the evaluations of individuals' personalities, traits, abilities, values, beliefs, expectations, motives, life events, relationships with significant others, social groups, possessions, and appearances. It includes also knowledge about the views of one's self that are held by others (Leary, 2004; Sedikides and Strube, 1997).

A key finding in psychological research is that the self-image (or one's identity) is a complex and dynamic construct. It is complex in the sense that at least three types of self-images can be distinguished: the personal, the relational, and the social self-image (Brewer and Gardner, 1996; Markus and Cross, 1990). The personal self-image describes how individuals perceive and evaluate themselves apart from others, i.e. it depicts the individuals' self-perceptions of own characteristics, traits, abilities and values. Individuals who perceive themselves as playing a role in a relationship use the relational self-image for their self-definition. The relational self-image is thus defined by ongoing interactions with significant others, e.g. by being a part of a social relationship. The prototypical example is a mother-child relationship where the mother defines herself as the role 'mother'. The social self-image or social identity is the individual's knowledge that he or she belongs to a certain social group. These group memberships carry some emotion and value for individuals being aware of a social identity (Tajfel, 1981; Tajfel and Turner, 1979).

The self-image is dynamic because the three different types of self-images coexist within the same individual, available to be activated at different times and in different contexts (Brewer and Gardner, 1996; Markus and Wurf, 1987).

¹The notion of the self-image has a quite different meaning compared to the notion of the self. The latter does not refer to images individuals have of themselves and is used, for example, in research related to Self-Determination Theory (Ryan and Deci, 2000).

3.3 *Motivational dimensions of the self-image*

There is consensus in most of the literature that individuals hold multiple representations of their self-images at various levels (Elster, 1986). For example, the concept of the working self (Markus and Wurf, 1987) assumes that at different points in time, different self-images are active and thus at all three levels, the personal, the relational, and the social, self-images have their room within the individual's self-perception. Moreover, individuals can see themselves as members of the same social groups, but differ in how they give precedence to some groups over others. Accordingly, social identity does not exhaust individual identity and both must be understood in relation to one another. Furthermore, even when considering personal self-images, society's impact must not be neglected, because it is the society that shapes the positivity or negativity of individuals' self-perceptions. A purely personal standard for evaluating oneself would be open to personal manipulation and, thus, become worthless (Heap, 2008).

Recognizing the importance of the concept of the self-image is valuable also for economics because the currently salient self-image filters the information individuals receive, process, and memorize and therefore influences (consumer) behavior. Hence, it is also of value to understand which self-image level affects (consumer) behavior the most. Gaertner et al. (2008), for example, declare the motivational primacy of the individual compared to the collective self-definitions. According to them, the personal self-image sits closer to the motivational core of individuals. Other scholars assume that personal identities are important constructions that are "there to be explained, not in themselves explanations" (Turner, 2006, p. 25). Cross-cultural psychologists assume that different cultures tend to produce different motivational precedence regarding the self. As Kitayama et al. (1997) figure out, Japanese society stresses communality stronger and this is seen as a different way to satisfy the self-esteem need. Therefore, the individual's self-structure is influenced by society, in particular by the explicitness of collectivism or individualism. As a result of these diverging views, it can be argued that the context seems to determine which self-image level is currently salient, supporting the view that the self-image is a complex and dynamic construct.

3.3 Motivational dimensions of the self-image

The previous section showed that individuals can have self-images at three different levels. On each of these levels, self-images can motivate behavior. In psychology, several identity-related needs or self-image motives were identified. Self-image motives are defined as pressures towards certain identity states and away from others, and individuals are not necessarily aware of these mo-

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tives (Devos and Banaji, 2003). In their review of the literature, Vignoles et al. (2006) find six identity motives. They suggest that individuals' self-definitions are influenced by the motives for self-esteem, continuity, distinctiveness, belonging, efficacy, and meaning. Other researchers draw a distinction between self-perception and self-evaluation. Self-perceptions – organized in the 'self-concept' – are the beliefs individuals have of themselves. With regard to these beliefs individuals evaluate themselves and the individuals' self-evaluations are regulated by different motives. Three major self-evaluative motives dominate the work in psychological literature. The three dominating self-evaluative motives are self-enhancement, self-verification, and self-assessment. Oftentimes, the motive for self-improvement is added to the list (Sedikides and Strube, 1995). Figure 3.1 presents a graphical summary of these four motives directly or indirectly related to the self-image.

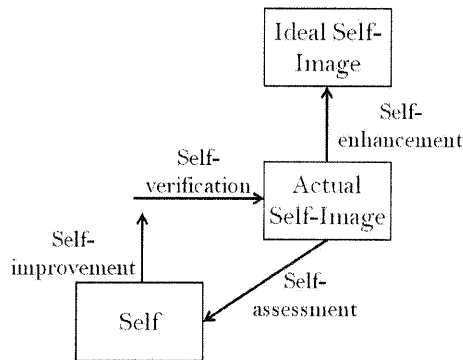


Figure 3.1: While self-verification and self-enhancement solely deal with the images that individuals have of themselves, self-improvement is related to the self (not to the image of it). Self-assessment bridges self-images and the self (Source: own illustration based on Sedikides and Strube (1995)).

The self-image motive for *self-enhancement* is most commonly defined as the desire to increase the positivity and decrease the negativity of one's self-beliefs. That is, individuals want to evaluate themselves in a positive way. Individual self-evaluation strongly depends on the difference between how the individuals actually view themselves (actual self-image) and how they ideally want to be (ideal self-image). Individuals evaluate themselves with their ideal self-image as a reference standard (Higgins, 1987). A high perceived discrepancy between one's descriptive self-image (how I believe I am) and one's normative self-image (how I want/ought to be) leads to psychological discomfort. The degree to which this evaluation is positive or negative can be labeled 'self esteem' (Leary

3.3 Motivational dimensions of the self-image

et al., 1995). This need to maintain and enhance self-esteem is widely assumed to be a fundamental human motive and already James et al. (1981) referred to self-esteem as an “elementary endowment of human nature”. Evidence for the operation of the self-enhancement motive is “impressive” (Sedikides and Strube, 1995, p. 1330), as individuals present themselves to others in a desirable manner and choose comparison targets that place themselves in favorable positions. Further evidence for the self-enhancement motive includes better than average effects, self enhancing illusions, the tendency of individuals to make self-serving attributions, and selectively recalling positive feedback about themselves (Sedikides and Strube, 1997).

High self-esteem, i.e. a positive evaluation of oneself, is achieved differently at the three different self-levels. Personal self-esteem is assumed to be derived from self-evaluations of personal traits and characteristics. These evaluations are often based on interpersonal comparisons with inferior others. When the relational self-concept is active, self-esteem is derived from appropriate role behavior. With a salient collective self-concept, self-esteem is derived from the relative status of the in-group in intergroup comparisons (Brewer and Gardner, 1996). Despite these differences in the pursuit of self-esteem, some authors emphasize its cross-cultural generability. Japanese society, for example, stresses communality stronger, which is just a different way to satisfy the self-esteem need (Kitayama et al., 1997). A possible explanation for why individuals need self-esteem, as Pyszczynski et al. (2004) argue, is that self-esteem is a protective shield designed to control the potential for terror that results from awareness of the possibility of death. Leary et al. (1995) go a step further in challenging the proposition of a fundamental self-enhancement need. These authors argue that self-esteem is a system (a *sociometer*) that has evolved to monitor the degree of social exclusion.

The second self-image motive, namely *self-verification*, is the motive to seek out and evaluate self-beliefs in a way that confirms core attributes of oneself and thus creates a feeling of consistency (Swann, 1983; Swann et al., 1987). Self-verification prevents the individuals from feeling inconsistent, which would cause problems to their self-worth. Self-verification is hence the motivation to seek information one already knows about oneself, whether negative or positive. The need to find information that confirms one’s self-image is especially salient when actual self-images are threatened. After having perceived identity-threats, individuals seek out information that confirms or verifies core attributes of themselves which recreates a feeling of consistency (Swann, 1983). There are several strategies of maintaining an accurate and reliable view of the self in order to achieve this feeling of consistency. Restriction of one’s life to a set of contexts, continuous revising of identities, establishing a core schema of the self that delivers a sense of a stable self, and

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attribution of changes in the self to changes in circumstances are some of the mentioned strategies. Swann (1983) shows that the desire for self-verification is so powerful that it can outweigh the individual tendency to prefer and seek positive evaluations. Once established, an accurate self-image is helpful, since it helps the individual to predict and control the environment.

Self-assessment describes the motive to seek completely new information about oneself. The motive refers to one's desire to pursue validity and reduce uncertainty about oneself. Again, it is not important whether this information includes positive or negative implications for the self. As evidence for the self-assessment motive, Sedikides and Strube (1995) mention that individuals prefer and engage in tasks of high diagnosticity, oftentimes irrespective of whether the task is likely to lead to success or failure. Accurate self-knowledge enables one to select activities or goals that are appropriate for one's level of skill and it provides a foundation on which individuals can grow or change (Taylor et al., 1995). Moreover, having a realistic self-image can protect the individual from too positive self-images which might be pleasurable in the short run but lead to various problems in the long run.

Taylor et al. (1995) suggest that adding a fourth motive, namely *self-improvement*, helps to more thoroughly clarify self-evaluative processes. They argue that the improvement of specific skills, traits, attributes, or well-being is the goal of many life tasks, regardless of whether individuals possess an accurate view of these skills or attributes. Self-improvement is different from a maximization of positivity of the self-concept, since, as its name implies, its focus is on getting better rather than on feeling better. Self-improvement refers to the desire to come closer to one's ideals and inhabits a strong orientation towards future. The desire to get better leads individuals to attend to, and be satisfied by, different sources of information than it is true for the other three motives (Taylor et al., 1995). A closely related motive is the one for self-expansion. According to the self-expansion theory by Aron et al. (2004), the desire to expand the self is a core human motive. Individuals seek to enhance their potential efficacy by acquiring social and physical resources that enhance one's ability to accomplish goals (contrary to the actual achievement of the goals). The most important resource for achieving goals is knowledge, but social status and community, possessions and wealth, physical strength and health are relevant, too. The theory is based on the idea of a fundamental drive for efficacy that is comparable to such drives as hunger and thirst. The need for efficacy is satiated when one knows that one has the potential to act efficiently (see also research on self-determination theory (Ryan and Deci, 2000)).

To sum up, reductions and low levels of the discrepancy between actual and ideal self-images (self-enhancement), as well as feelings of stability (self-

3.3 Motivational dimensions of the self-image

verification) and realism of the actual self-images (self-assessment), feel good and therefore reinforce behavior. To the contrary, increases and high levels of self-image discrepancies as well as threats to one's actual self-image induce psychological discomfort and motivate behavior to reduce these bad feelings. In their striving to reduce self-image discrepancies, individuals search for information that enhances the positivity of their actual self-images (i.e. self-enhancement as a stable form of self-deception). However, individuals can also try to genuinely improve their actual selves (self-improvement). As a result, it is likely that also their self-images become better, though in a more lasting way because no self-deception is needed. For this self-improvement, accurate knowledge about oneself is important and the motive for self-assessment describes the individual desire to obtain such knowledge.

In order to use these four motivational dimensions to understand consumer behavior more thoroughly, it is helpful to know in what circumstances which motive is activated. In this regard, Swann et al. (1987) discover that the self-enhancement motive stands in the opposite direction to the desire for self-consistency or self-assessment. Swann et al. argue that cognitive processes are involved when self-consistency is desired. However, when self-enhancing motives are salient, affective processes are the important ones. In their Self-Concept Enhancing Tactician (SCENT) model, Sedikides and Strube (1997) propose that the primarily self-evaluation motive is self-enhancement. The SCENT model postulates that individuals can self-enhance either directly (candid self-enhancement) or indirectly (tactical self-enhancement). Tactical self-enhancement is carried out through attempts to self-verify, self-assess, or self-improve. These three motives don't serve a goal in their own, but serve self-enhancing ends. This framework is used as a heuristic to consider potential moderators, i.e. variables that regulate the activation and relative prevalence of the self-evaluation motives, that govern the expression of the four motives. However, based on the different results, it seems to be too far-fetched to argue that one self-image motive is more important than another. It may be helpful to understand in which context which self-image motive tends to drive behavior. Therefore, in the following section some well-known identity-related theories and the way they use self-image motives are presented.

3.4 Theories related to the self-image

Social identity theory and social categorization theory

The social identity theory is one of the major psychological theories. It is based on the work of Henri Tajfel (1974) and was further developed by Tajfel and Turner (1979) in the social categorization theory. Tajfel defined social identity as “the individual’s knowledge that he belongs to certain social groups together with some emotional and value significance to him of his group membership” (Tajfel, 1972, p. 292, as cited in Hogg and Terry 2000). Individuals define themselves as having several discrete group memberships that vary in importance in their self-images. Social categories provide a definition of who one is, i.e. of one’s social identity. The process of categorization produces the way in which individuals perceive the group-distinctive stereotypes or prototypes and assigns individuals to the relevant categories. A group prototype is a subjective representation of the defining attributes (beliefs, attitudes, behaviors) of a social category. Prototypes are constructed to minimize intra-category differences and to maximize inter-category differences. This is why prototypes are influenced by the in-group and the relevant out-group, too (Turner et al., 1987).

For each group membership, there are distinct attributes that are described by the related social identity. A salient social identity defines the way in which one perceives oneself or, more specifically, oneself is perceived as the in-group stereotypical self. Additionally, one perceives the relevant out-group members as out-group stereotypical. Social identities are highly dynamic as they response to intra- and inter-group changes. Attitudes and behavior towards other group members become competitive and discriminative. According to social identity theory, individuals are depersonalized. They are perceived rather as an in-group prototype than as a unique individual. The social category that is active explains similarities and differences among individuals. Thereby, the social identity theory depersonalizes individuals into group members and individuality into group behavior. The self is evaluated in terms of group membership rather than in terms of personal characteristics (Hogg et al., 1995).

Having a salient social identity helps to achieve and maintain in-group/out-group comparisons that favor the in-group. Through this positive evaluation of the in-group, the mental representation of one’s social self-image is enhanced. It is assumed that the self-image motive for self-enhancement can be achieved by comparing one’s in-group with out-groups in ways that favor the own group. Thus, self-esteem is closely connected with social identity as the group’s status attaches to one’s self-image. Also, the need for self-verification is connected

to social identities as individuals have preferences for consistent contents of their social identities.

Optimal distinctiveness theory

The optimal distinctiveness theory, developed by Brewer (1991), is an extension of the social identity theory (Mummendey, 2006). Brewer suggests that social identities mediate between two opposing basic human needs. The fundamental tension between the need for similarity to others (Baumeister and Leary, 1995) and the countervailing need for uniqueness and individuation can be relaxed by the commitment to social categories. Social identity (theory) can be viewed as a compromise between assimilation and differentiation from others, where the need to belong can be satisfied within in-groups, and the need for being different is met through intergroup comparisons. Thus, group identities allow us to be both similar to others and different from others.

Identity theory

The identity theory (Stryker, 1968) is the only non-psychological theory presented in this section. It is a sociological theory and sets out to explain role-related social behaviors that constitute out of the relationship between the self and the society. Just like in the social interactionist's view (Cooley, 1902; Mead, 1967), society is meant to affect social behavior through its influence on the self. The self is seen as multifaceted and organized construct with many components. These components are called roles. Roles consist of the expectations that individuals have concerning which behavior is appropriate in certain situations. Individuals may have as many distinctive roles as there are distinct groups whose opinions matter to them. Role identities provide meaning to the self because others respond to a person in terms of his or her role identity. These responses form the basis for developing a sense of self-meaning and self-definition. Society provides roles that are the basis for identity but the self actively creates the society. Hence, there is an interactive reciprocal relation between the self and society in the sense that each influences the other. The self-perception of somebody enacting a role satisfactorily enhances feelings of self-esteem and poor role performance engenders doubts about one's self-worth. Dissonances are reduced when individuals modify their behavior and achieve a match between their self-image and what they perceive as appropriate role behavior. Thus, identity theory links role identities to individuals' feelings and behavior, in particular to behavior that is related to social relationships.

3 Identity and economics: An overview

In identity theory, it is acknowledged that some roles are more relevant to the self-image than others. The role identities are organized hierarchically in the self-concept with regard to how often the role is used. The currently used role is the salient one. Identity salience is the likelihood that the identity will be invoked in diverse situations. The higher an identity is positioned in the salience hierarchy, the more closely it is tied to actual behavior. Thus, salient identities affect behavior, they affect outcomes, and they influence relationships. The importance or relative salience of a particular role is determined by the commitment to that role. Commitment is the degree to which the relationships to others are dependent on the salient role. If many social relationships are active when a certain role is salient, this role has high commitment. Therefore, commitment and salience are positively correlated. According to identity theory, social roles are the main aspect that define the self, but there are other aspects, too. Attributes like gender, race, ethnicity have an indirect impact on the self as they affect the social position of the roles individuals can hold (Hogg et al., 1995).

Social comparison theory

Social comparisons are one source of self-evaluative information. Individuals compare their traits, abilities, opinions, and emotions with others to enhance, verify, assess, or improve themselves. According to Festinger's (1954) social-comparison theory, upward, downward, and lateral comparisons are possible. While comparing themselves with superior, inferior, or lateral others, individuals assimilate or contrast themselves with these others. In each case, different effects for self-evaluation follow. Contrasting oneself with inferior others, i.e. a downward comparison, is used to enhance or protect subjective well-being and thereby satisfy the self-enhancement motive (Suls et al., 2002; Taylor et al., 1995). On the other hand, individuals avoid comparisons with others in dimensions in which they expect to turn out badly, because such bottom-up comparisons might be a threat to self-esteem (c.f. Mummendey, 2006). In order to achieve an accurate self-view, i.e. to follow the self-assessment motive, individuals compare themselves with similar others. These lateral comparisons are seen to ascertain the accuracy of one's self-perception. Upward social comparisons are partly made for the sake of self-improvement.

Self-affirmation theory

The self-affirmation theory (Steele, 1988) can be seen as a manifestation of the self-enhancement motive as it rests on the individuals' needs to maintain global images of themselves as being competent, good, coherent, unitary, stable, and

3.4 Theories related to the self-image

capable of free choice. The theory argues that disruptions might occur when one engages in behavior or learns something about one's self that threatens the overall perception of self-integrity. To reduce the impact of disruptions to their self-concept, individuals focus on, and affirm to, their competence in some other, alternative area. Individuals might also respond to challenges to their positive self-images by, for example, derogating a member of an out-group (Fein and Spencer, 1997). Inconsistency is not reduced by self-affirmation, but rather one's overall sense of self is restored.

Self-discrepancy theory

The self discrepancy theory (Higgins, 1987) explains how different types of self-beliefs are related to different kinds of emotional vulnerabilities. That is, the theory explains how self-perception is tied to self-evaluation. In the theory, one can find six states of self-beliefs. For each standpoint (own or significant other) one domain of the self (actual, ideal, or ought) is considered. The actual self represents attributes the individual assigns to him-/herself or which the individual believes significant others (parents, partner or friends) assign to the individual. The ideal self includes attributes the individual ideally wants to assign to him-/herself or which the individual believes significant other individuals would ideally assign to him-/herself. The ought self reflects attributes that the individual or others consider as the normatively right attributes for the individual. Discrepancies between these states bring about psychological discomfort. For each kind of discrepancy a certain kind of psychological discomfort is supposed to exist. These types of discomfort motivate individuals to achieve a situation in which the individual's self-concept matches the personally relevant self-standard. Which self-concept (ideal or ought) is the relevant one and how strong the discrepancy (actual/ideal or actual/ought) is, varies situationally. The stronger and easier to access the discrepancies are, the more discomfort the individual suffers.

Symbolic self-completion theory

The symbolic self-completion theory (Gollwitzer and Kirchhof, 1998; Wicklund and Gollwitzer, 1982) deals with identity-related striving. Following Lewin's (1926) idea of goal striving, the theory focuses on the implementation of previously chosen identity goals, i.e. on how the desired or ideal self is achieved behaviorally. Situations in which individuals have certain identity-goals, but experience a lack of related symbols, can lead to a feeling of incompleteness. Such a lack can be the result of negative performance evaluations or social comparisons with negative outcomes. The feeling of incompleteness

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motivates a striving for the acquisition of the identity-related symbols, which is labeled symbolic self-completion. In order to acquire self-defining goals, individuals are assumed to accumulate relevant indicators. The theory labels these indicators symbols, because they symbolize the completeness of a self-definition. Symbols are socially defined and have to be legitimized and accepted by society. Only when individuals are committed to a self-definition they attempt to compensate for identity-related shortcomings through self-symbolizing.

Individuals can strive for symbols connected with a specific identity in several ways. They can exercise identity-related social influence or strive for an identity through the fulfillment of the daily duties associated with a particular identity. They can simply make a verbal claim to possess a particular identity, or acquire skills and tools associated with an identity, or individuals can display material symbols (huge office, expensive automobiles). Effective striving for an identity goal necessitates that identity-related efforts are noticed by others. But self-symbolizing individuals do not want to make a certain expression in front of others. They only use others as an audience or as a passive witness of identity-related goal striving. Hence, according to this theory social interactions are important but not in the way of self-presentation or of status considerations or conspicuous consumption.

Individuals can also compensate for the lack of certain identity-related symbols with alternative symbols related to other identity-goals. Wicklund and Gollwitzer (1982) consider situations in which the individual undergoes failure, but is still able to achieve the desired identity-goal with alternative symbols. The success of such substitution is moderated by the degree of commitment to the salient identity-goal. If commitment to the identity-goal is high, i.e. the goal strongly serves an individual's need for high self-esteem, individuals might have to find symbols for the threatened self-definition and substitution to other symbols is restricted. Only in the case of low commitment, other symbols that do not explicitly support the certain self-definition might work to reaffirm one's self-esteem. After the need for self-completion is satiated, the tension diminishes. But for many identity-goals there is no clearly defined end state and satiation might not occur. After one relevant symbol is attained, new identity-relevant symbols might gain importance and new identity-striving is evoked.

The sociometer theory

Leary et al. (1995) challenge the proposition that individuals have a fundamental need to maintain and enhance their self-esteem. They acknowledge that self-esteem has been invoked in the explanation of many psychological

3.4 Theories related to the self-image

phenomena but criticize that little attention has been paid to the source of the self-esteem motive itself. Leary et al. argue that the source of self-esteem is the evolved motivation to protect the person against social rejection and exclusion. Human beings possess a fundamental motive to seek inclusion in important social groups and this motive has evolved because of its survival value. Leary et al. hypothesize that self-esteem functions as a ‘sociometer’ that monitors the degree to which the individual is being included versus excluded by other individuals. Thus, maintaining high self-esteem is not a goal on its own, but rather it functions to protect the person against social rejection, which certainly implied tough survival pressure in earlier times. What has previously been viewed as a threat to self-esteem is, at a more basic level, an event that makes salient the possibility of social exclusion. It is the perceived feeling of exclusion, felt through low self-esteem, that motivates the person to behave in ways that minimize the probability of further rejection or exclusion. Leary et al. suggest that the sociometer system responds primarily to exclusion rather than to inclusion. They argue that individuals are mostly motivated to behave in certain ways when they feel deprivation, rather than just less-than-complete satiation. They compare the sociometer with a gauge which makes itself felt when the evolutionary dangerous possibility of social rejection occurs.

Kirkpatrick and Ellis (2004) emphasize the evolutionary aspects of sociometer theory. In a generalizing account of sociometers, they argue that evolutionary psychology offers a powerful way to explain many issues related to self-evaluation and self-esteem. An evolutionary perspective on self-esteem focuses the attention to the functional value of self-evaluations. Leary et al.’s sociometer is supposed to represent an adaptation, designed by natural selection, to the adaptive problem of being accepted by others as part of the group. But, according to Kirkpatrick and Ellis, this is only one out of many mechanisms that have evolved in human brains as solutions to selection pressures in ancestral human environments. Another sociometer related to self-esteem that may explain why individuals strive for high status is designed to monitor where one stands in relation to others. Knowing one’s local standing has been extremely valuable for guiding behavior and increasing the probability of survival.

3.5 How (some of) these theories were integrated into economics

The neoclassical strategy

Akerlof and Kranton (2000) incorporate the concept of identity into a standard neoclassical utility function framework. While doing this, they draw directly from social psychology's social identity theory and self-categorizing theory. In their view "identity is bound to social categories" (Akerlof and Kranton, 2000, p. 720) and how individuals in this categories should behave. In their notion, identity equals social identity and is based on social differences. That is, the individual's self-image is not an image of the self as a whole but rather an image of the aspects of the multidimensional self associated with the social categories assignable to the individual. Formally the utility function

$$U_i = U_i(\vec{a}_i, \vec{a}_{-i}, \vec{I}_i) \quad (3.1)$$

of individual i depends on own's actions \vec{a}_i , other's actions \vec{a}_{-i} , and i 's identity or self-image I_i . This identity is the extent to which a person's individual characteristics match the social ideals of the categories that apply to the individual. Thus identity which is given by

$$\vec{I}_i = I_i(\vec{a}_i, \vec{a}_{-i}; \vec{c}_i, \epsilon_i, \vec{P}) \quad (3.2)$$

depends on own's actions \vec{a}_i , other's actions \vec{a}_{-i} , the assigned social categories \vec{c}_i , and on the extent to which i 's own given characteristics ϵ_i match the ideal of i 's assigned categories indicated by the prescriptions \vec{P} of each category. The self-image argument \vec{I}_i is a vector that reflects the different social categories that are assignable to the individual. In the simplest model the individual chooses own actions to maximize his utility, taking as given \vec{c}_i , ϵ_i , and \vec{P} . In more sophisticated cases individuals may also choose the category assignment \vec{c}_i and individual actions may affect the prescriptions \vec{P} , the set of social categories \vec{C} , and the status of different categories reflected in $\vec{I}(\cdot)$. The identity part of the maximization process represents a defense against anxiety which occurs when a person experiences a violation of her internalized rules of behavior. These rules of behavior are associated with social categories and when violated, individuals commit actions to restore the suitable self-image. Thus, maximizing utility can be seen as minimizing the dissonance between certain characteristics of the individual and the ideal characteristics of certain social categories.

Akerlof and Kranton (2000) apply this model to a variety of real world situations such as gender discrimination in the labor market, the household

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division of labor, and the economics of social exclusion and poverty. In later paper's they extend their analysis of identity to identity in education, identity in organizations, and identity in macroeconomics (Akerlof, 2007; Akerlof and Kranton, 2002, 2005).

Akerlof and Kranton's approach of integrating identity into economics is criticized by Davis (2006, 2007) who points out that Akerlof and Kranton's analysis is restricted to the social aspects of identity and only reflects an aspect of the self-image, rather than the self-image per se. As individuals who see themselves as members of the same social groups can differ in how they give precedence to some groups over others, social identity does not exhaust individual identity (Davis, 2007; Gaertner et al., 2008). He suggests to label \vec{I}_i the "social image of the self" which the individual adopts, rather than a self-image. However, following Davis even this aspect of the self is not appropriately considered. Davis criticizes that Akerlof and Kranton's approach does not address how individuals' different social identities are related. What Akerlof and Kranton do address is how one single salient social identity affects economic outcomes. Therefore, this analysis is of a partial equilibrium type and the practical relevance is limited. Davis suggests personal identity to be the body in which social identities might be organized. He embeds Akerlof and Kranton's utility function in a personal identity objective function

$$\vec{P}I_i = \vec{P}I_i[U_i(a_i, a_{i-1}, \vec{I}_i)]. \quad (3.3)$$

In this framework the individual identity can be seen as reflexive, because the individual takes the arguments of the revised utility function U_j as the subject's object. Moreover, $\vec{P}I_j$ can be seen as a production function in which individuals actively manage and change their personal identities. Reflexivity, in this account, is the ability to create a personal identity by reflexively engaging with oneself in the form of one's social identities. Formally, Davis replaces Akerlof and Kranton's approach in which identity appears as a choice variable with an approach in which the utility function itself is chosen (Fine, 2009). Moreover, Davis stresses that Akerlof and Kranton do not say anything about the concept of personal identity or the idea of identity apart from others and interprets the concept of the personal self employed in Akerlof and Kranton as the utility-function itself. In doing so, Davis criticizes Akerlof and Kranton's approach but, in the same way, the psychological social identity theory. Both do not offer a description of the relationship between different social categories, how social identities are ranked, and how this ranking comes about or can change. According to Davis, this is an important aspect, because individuals have multiple social identifications. Davis concludes that it "is the sociological approach to identity, not psychology's social identity approach

3 Identity and economics: An overview

(see section 3.4), which offers the outlines of an account of how social identity is related to personal identity” (Davis, 2007, p. 354). An advantage of the sociological approach to identity, he argues, is that it does not consider social categories as exogenously given to the individual. Quite contrary to that, in the sociological approach to identity, individuals are seen as interacting and negotiating social structures and social identity is something that is produced by individuals. There is a difference between a choice between identities and a choice between activities in defense of a single social identity, and only the later is the subject of Akerlof and Kranton’s basic model.

One further interesting departure from Akerlof and Kranton’s approach is that in Davis model, individuals do not maximize their objective function, i.e. their personal identity. Davis argues that a process of rational utility-maximization cannot account for the reflexive treatment of \vec{PI}_j , because it lacks a means-end relationship with given ends. Acknowledging that self-images are complex and dynamic constructs and that individuals can actively determine these self-images renders the rational utility maximization approach useless. To apply the maximization calculus it has to be clearly defined what it is that shall be maximized. When identities change over time and situations, even as a result of individual behavior, this is not the case. Hence, if Akerlof and Kranton (2000) wanted to integrate the basic psychological findings that self-images are dynamic and that individuals can actively determine their self-images, Akerlof and Kranton had to depart from the utility maximization calculus. Hence, Akerlof and Kranton (2000) neglect that the self-image is a complex and dynamic construct that can be changed by the individuals themselves for good reasons. To solve the problem, Davis argues that personal identity can be defined by an “obligation-based deontological rather than instrumental rationality” (p. 360). In Davis’ framework, individuals operate with two different types of decision logics. On the one hand, a deontological decision logic is used to produce personal identity. On the other hand, an instrumentally rational decision logic minimizes dissonances between the social image of the self and the in-group prototype, just like in Akerlof and Kranton’s approach. Solely optimization is accordingly not enough to explain how individuals produce their personal identity.

Although Davis’ approach seems to be closer to a satisfying use of identity in economics, it can be criticized, too. Davis assumes that the personal identity function is the individual’s objective function. However, personal identity in Davis’ model corresponds to the self as a person or as the personality, rather than the mental representation of the self as an object. Thus, he mixes the notions of the self and the self-image. His framework can, accordingly, account for behavior driven by the need for self-improvement, but does not deal with the other three self-image motives. Moreover, by suggesting personal identity

3.5 *How (some of) these theories were integrated into economics*

to be a function including the individual's utility which in turn includes the social identities, Davis proposes a hierarchical structure of self-levels that is not indisputable. It seems to be more realistic that personal and social self-images are salient at different situations, thus leading to differently motivated behavior. A hierarchical ordering as assumed by Davis is not in line with the literature presented in sections 3.2, 3.3, and 3.4.

In a related but even more skeptical criticism of Akerlof and Kranton's approach, Fine (2009) argues that Akerlof and Kranton's theory exclusively relies on the choice of given identities, rather than on the creation of identities by reflecting agents. According to Fine in Akerlof and Kranton's framework, choosing an identity has to be subject to the same axioms that have to apply when individuals choose to buy, for example, consumption goods. The problem, he points out, is that preferences over identities are neither continuous nor transitive. The latter follows from problems related to finite perception, incomplete expression, and the presence of multiple criteria. The concept of revealed preferences based on a utility maximization process thus does not work when applied to the choice of identity. Moreover, without exogenously given identities, the technological apparatus of utility maximization cannot be adopted. Additionally, the individual's identity-choice depends on the identity-choices of all others. Thus, Akerlof and Kranton's concept runs into classical problems known from social choice theory, such as impossibility theorems and interdependent preferences. More generally, Fine criticizes that the way Akerlof and Kranton introduce identity into economics takes away the merits that such integration in principle could have. He complains that the in and of itself interesting concept of identity is squeezed into a utility function which has inherent limits itself. Akerlof and Kranton's integration of identity into economics is part of a continuing program of colonization of non-economic subject matter. In criticizing this colonization, Fine (2009) argues that Akerlof and Kranton's squeezing of identity into a utility function says "more about the contemporary identity of economics than they do about the economics of identity" (p. 189). As an alternative, Fine suggests to abandon the utility-maximization concept when introducing social aspects like identity to economics. In his opinion, the neoclassical technological apparatus runs into logical inconsistencies when the social is wanted to be derived from aggregated individual behavior.

An equilibrium approach to identity

In their integration of identity into economics, Horst et al. (2006) present a model that utilizes optimal distinctiveness theory and self-discrepancy theory (see section 3.4). The model describes the development of personal identities.

3 Identity and economics: An overview

Personal identities are specified by three components: the individuals' characteristics, the self-images, and the social groups the individuals belong to. These three components can change over time, driven by the agents objective to attain the characteristics of their ideal self-images. In order to achieve these desired self-images, individuals assign themselves to social categories. Individuals know that belonging to a certain group changes their characteristics. Thus, the belonging to a certain social group is not a goal in itself but rather a means to acquire the characteristics of the respective group and accordingly getting closer to one's ideal self-image. In accordance with self-discrepancy theory, individuals want to avoid discrepancies between actual and desired self-images. Individuals might feel such discrepancies when the groups they belong to and the characteristics of their ideal self-images are not compatible. This discrepancy is what motivates them to change their group membership and accordingly the social group itself changes as the composition of participants changes. Horst et al. (2006) thus endogenize both personal identities as well as the groups' structures. It is their aim to find conditions under which these endogenous processes of identity and group formation lead to a unique equilibrium. They define this stochastic equilibrium as a situation in which a given number of social groups with given group-characteristics exist. Individuals can move between groups but the distribution of individuals over groups does not change. They find that when personal identity is weak, i.e. when individuals do not put too much weight on the current states of their personal identity when revising their choices, then the aggregate equilibrium turns out to be unique and asymptotically stable.

Evolutionary economics and identity

“The evolutionary critique”, Potts (2008) argues, “of the neoclassical model of agent identity is analytically equivalent to the critique of the neoclassical model of technological change, namely that it renders the prime variable, namely the dynamics of identity (technology), effectively exogenous to the model.” (p. 5). As becomes obvious from this quotation, in contrast to Akerlof and Kranton's approach to identity, in his evolutionary economic approach to identity Potts endogenizes identity, thus bearing a resemblance to Davis's (2007) criticism. Potts (2008) suggests that identity is the summation of generic rules, and when these rules change identity changes accordingly. Potts calls this process of endogenously changing identities “identity dynamics”. To explain the way in which identity dynamics function, Potts borrows from the optimal distinctiveness theory (Brewer, 1991). Just like in this theory, agents seek to maintain differentiation as well as social connections. The latter is maintained when agents identify with others who have internalized

3.6 Concluding remarks

and signaled the same generic rules the agent holds himself. Some of these generic rules are institutionalized as social categories, but others are only weakly defined. Located between these two opposing needs, the agent's optimization problem is not over utility, but rather over identity. More precisely, identity dynamics consist of three phases, namely origination, adoption, and retention. Identity changes when new information, for instance a change in the socio-economic context, arrive. But it is more than a change of the information an individual possesses: "New information changes what the agent knows; but new knowledge adopted and retained changes what the agent is" (p. 6). New generic rules, and thus a new identity, lead to changes in the agent's sense of self and how one's status is perceived. What follows from a changed sense of self are endogenous changes in agent's preferences, consumption, and other factors affecting the agent's position in the social system. The described identity dynamics on the one hand and socio-cultural changes on the other hand, both build a co-evolutionary dynamic system that is affected by new incoming knowledge. While the change of a person's sense of self might be the result of an adoption to new ideas emerged through socio-economic change, changing identities affect the socio-economic context, too. Identity dynamics are not just a consequence of economic evolution, but also its cause. Potts argues that identity dynamics are as important as price and quantity changes. Although happening on different scales, both are mechanisms driving economic evolution. Potts argues for his focus on identity dynamics, in contrast to neoclassical equilibrium statics, because the former allows to account for things like preference endogeneity or the multiple-selves problem.

3.6 Concluding remarks

The major aim of this chapter is to provoke more thoughts about, and future research on, the roles that self-images play in economically significant situations. To do so the chapter presented an overview about various psychological and one sociological theories dealing with self-images and identities. In this overview, the roles played by four motives (or needs) related to self-images were emphasized. Moreover, the chapter presented and discussed three ways how psychological theories dealing with self-images were integrated into economic models.

4 Towards an incentive salience model of intertemporal choice¹

4.1 Introduction

Individuals oftentimes have to choose between obtaining either smaller sooner rewards or larger later ones. Such intertemporal decisions include the trade-offs between small immediate pleasures of smoking or feasting and larger future benefits of good health. Also purchases of not necessarily needed consumption goods provide immediate benefits but might cause financial problems at the end of the month. Oftentimes, these intertemporal decisions are characterized by dynamic inconsistencies: While individuals plan to abstain from smoking, feasting, or consuming goods at the beginning of the month, these plans are often thwarted by urges to smoke, eat, or consume. Hence, as the future becomes present over time, the individuals' intertemporal preferences change towards preferring immediate payoffs.

These dynamic inconsistencies have gained considerable attention in various disciplines such as economics, psychology, and neuroscience (Ainslie, 1975; Frederick et al., 2002; Laibson, 1997; McClure et al., 2004). One way to explain dynamic inconsistencies is to assume that decisions between two future outcomes are guided by the reflective decision making system alone, whereas intertemporal decisions with an immediate outcome in the choice set are additionally influenced by the impulsive decision making system (Berns et al., 2007; Laibson, 1997; Strack et al., 2006). Following the distinction between the impulsive system (called System 1) and the reflective system (System 2) (Kahneman, 2011), this chapter takes a closer look at the impulsive decision making System 1. Therefore, the chapter borrows from recent and influential neuroscientific research by Kent Berridge and colleagues (e.g. Berridge, 1999; Berridge and Aldridge, 2008). This research suggests that sometimes reward 'wanting' and reward 'liking' can become dissociated. Reward is thereby dissociated into a motivational component ('wanting') and a pleasure component ('liking') and both components do not necessarily have to coincide. Based on the insight that 'wanting' and 'liking' can become dissociated, Berridge and

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colleagues provide a brain-based explanation for impulsive behavior (Berridge, 2002; Berridge and Aldridge, 2008). They argue that under certain conditions, cues can trigger motivational ‘wanting’ peaks without influencing ‘liking’ reactions. This chapter integrates this cue-triggered ‘wanting’ mechanism into an otherwise standard discounted utility model. The resulting new intertemporal choice model will be called the incentive salience model of intertemporal choice. The incentive salience model offers explanations for some findings that other intertemporal choice models have difficulties to explain. For example, using the incentive salience model one can explain why only certain types of rewards elicit dynamic inconsistencies in the form of impulsive behavior and why other rewards do not (Dittmar and Drury, 2000; Estle et al., 2007; Loewenstein, 1996).

The chapter proceeds as follows: Section 2 presents some common models of intertemporal choice and shortly investigates their strengths and weaknesses in explaining impulsive choices of smaller sooner rewards instead of larger later ones. Section 3 introduces neuroscientific findings suggesting that reward ‘wanting’ and reward ‘liking’ are two dissociated processes. Section 4 presents the cue-triggered ‘wanting’ mechanism as a microfoundation of the impulsive decision making System 1. The fifth section integrates the cue-triggered ‘wanting’ mechanism into an otherwise standard discounted utility model, resulting in the incentive salience model of intertemporal choice. Section 6 discusses the model, among other things by showing in how far the model can account for known anomalies in intertemporal choice. The last section concludes.

4.2 Intertemporal discounting models and impulsivity

Generally, individuals prefer to obtain rewards earlier compared to obtaining them later on. That is, individuals discount the subjective value of a future reward as a function of its delay. The rate with which the reward is devalued per period is called the discount rate (q). In the standard model of intertemporal choice, i.e. in the discounted utility model (Samuelson, 1937), q is assumed to be constant. This constant discount rate implies that in each period the reward is discounted by the same discount factor ($\delta = 1/(1 + q)$), which is reflected by the exponential discounting function ($D(t) = \delta^t$). However, based on mostly experimental evidence suggesting that discount rates decrease with the delay (θ) with which rewards can be obtained, the assumption of constant discount rates over time was largely rejected. This evidence indicates

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that at least some individuals have dynamically inconsistent preferences; these individuals are patient (low q -values) when making plans for the future but impatient (high q -values) when the potential consumption act approaches immediacy. As alternative models that can explain a good part of these dynamic inconsistencies, hyperbolic discounting models were suggested (Ainslie, 1975; Frederick et al., 2002; Loewenstein and Prelec, 1992). In these models, the temporal immediacy of rewards corresponds to relatively high discount rates.²

In behavioral economics, the commonly used intertemporal choice model is Laibson's (1997) β - δ model. This model was first proposed by Phelps and Polak (1968) in the context of intergenerational altruism and was later adapted by Laibson to model intrapersonal dynamic conflicts. The model follows dual process theories which assume that human decision making is best explained by conceptualizing the individual as consisting of two distinct decision making systems (Berns et al., 2007; Hoch and Loewenstein, 1991; Kahneman, 2003, 2011; Loewenstein, 1996; Strack et al., 2006). The first System, called System 1, is affective, automatic, impulsive, heavily values the present, and is strongly influenced by situational factors. In the β - δ model, System 1 is reflected by the β parameter. System 2, which is reflected by the δ parameter, is characterized by analytic preferences, patient behavior, willpower, and cognition. β and δ represent two separated discount factors, corresponding to System 1 and System 2 respectively. Whereas System 2 discounts all future rewards with a constant rate per period, System 1, reflected by the β parameter, makes a sharp distinction between immediate rewards and future rewards: when an immediate reward is in the choice set, the reward in the next period is discounted with $\beta\delta$, but when both rewards will occur at two successive periods in the future, the later reward is discounted only with δ (Laibson, 1997). Accordingly, the β - δ model's discount function ($D(\theta) = 1, \beta\delta, \beta\delta^2, \beta\delta^3, \dots$) is quasi-hyperbolic with discount factors varying discretely over time. The utility function corresponding to a temporal prospect (c_t, \dots, c_T) where future consumption is discounted quasi-hyperbolically is given by

$$U_t = E_t \left[u(c_t) + \beta \sum_{\tau=1}^T \delta^\tau u(c_{t+\tau}) \right], \quad (4.1)$$

where $u(c_t)$ is the utility gained from consumption c at time t , and β and δ are discount factors both bound between 0 and 1.

²A simple example for a hyperbolic discount function proposed by Ainslie (1975) would be $D(\theta) = 1/\theta$ and a more general one suggested by Loewenstein and Prelec (1992) $D(\theta) = 1/(1 + \alpha\theta)^{\beta/\alpha}$. As discount rates are defined by $-D'(\theta)/D(\theta)$, the discount rates corresponding to both discount functions are $q(\theta) = 1/\theta$ and $q(\theta) = \beta/(1 + \alpha\theta)$ respectively. Both discount rates decrease with rising delay.

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The β - δ model has proven to be useful to explain various cases of intertemporal choice. These contain the choices between watching a highbrow or a lowbrow film (Read et al., 1999), choices between healthy and unhealthy snacks (Read and Van Leeuwen, 1998), early retirement patterns of workers (Diamond and Köszegi, 2003), and contract choices in health clubs (DellaVigna and Malmendier, 2006). Moreover, it has gained neuroscientific support by McClure et al. (2004) who examined the neural correlates of intertemporal choice for primary and secondary rewards (McClure et al., 2007, 2004). They found that activation in brain areas that are heavily innervated with the dopaminergic midbrain system (the ventral striatum, the medial orbitofrontal cortex, and the medial prefrontal cortex) is associated with the β parameter, while activation in the lateral prefrontal cortex and posterior parietal cortex is associated with the δ parameter.³ Still, some caveats remain in the quasi-hyperbolic discounting model. For example, it is still difficult to give an explanation for the finding that certain rewards (clothes, food items, and addictive drugs) are more steeply discounted than other rewards (e.g. money) (Dittmar and Drury, 2000; Estle et al., 2007). Moreover, the sudden and strong urges that induce impulsive consumption can go beyond what could be modeled by the already myopic discount rates in hyperbolic discounting models (Frederick et al., 2002). To understand intertemporal choice more thoroughly, one possibility is to investigate the impulsive β system in order to understand why this system heavily (over-) values the present. In other words, a microfoundation of the β parameter is needed.

Two potential microfoundations of the β parameter are based on visceral influences (Loewenstein, 1996) and cue-contingent preferences (Laibson, 2001). The microfoundation of the β parameter that will be presented later on in this chapter is strongly related to these two theories. Visceral influences correspond to drive states such as hunger, thirst, sexual arousal, and to some negative emotions such as exhaustion, pain, or fear for physical safety. As part of System 1, these visceral influences often overwhelm other goals stated by System 2 and thus produce short-sighted, impulsive behavior (Loewenstein, 1996, 2000). Although individuals anticipate the influence of visceral factors on their behavior, individuals tend to underappreciate the magnitude of this influence (Loewenstein et al., 2003). The theory of cue-contingent preferences (Laibson, 2001) argues that cues can increase the marginal utility of rewards associated with the cues. For example, the smell of baking cookies is argued to induce hunger in individuals who associate cookies with eating. Thus, in this framework cues that were previously associated with rewards can change the

³Though there are also neuroimaging studies that support a unitary discounting system (e.g. Kable and Glimcher, 2007).

drive states the individuals are in and thus induce impulsive behavior (Berns et al., 2007).

4.3 ‘Wanting’ versus ‘liking’

The microfoundation of the β parameter suggested in this chapter is based on recent and influential neuroscientific research investigating the neural correlates of reward (Berridge, 1999). Berridge and colleagues’ findings suggest that preferences contain a motivational component and a pleasurable component. These two components, called ‘wanting’ and ‘liking’ respectively, are not only conceptually different, but are also related to distinguishable processes in the brain.⁴ Although consciously, we humans almost always want what we like, and vice versa like what we want, the unconscious core process of the motivation to pursue a reward (‘wanting’) and the core process of hedonic pleasure (‘liking’) can become dissociated.⁵ An example of a situation where such ‘wanting’–‘liking’ dissociations occur is binge eating (Berridge et al., 2010; Lemmens et al., 2011). In this line of research, it is argued that food cues can induce eating urges in hungry individuals. In such situations, individuals ‘want’ food to a higher degree than they expect to like the same food items. Another example where ‘wanting’–‘liking’ dissociations can occur is drug addiction (Bernheim and Rangel, 2004; Robinson and Berridge, 1993, 2008). In their incentive salience theory of addiction, Robinson and Berridge argue that drug addicts perceive extremely strong cravings when they encounter drug-related cues, although these addicts usually do not expect to like the drugs. Other examples for ‘wanting’–‘liking’ dissociations include situations where individuals experience failure in pursuing desired outcomes (Litt et al., 2010), and preferences towards the aesthetic features of male and female faces (Dai et al., 2010). Moreover, Kahneman et al.’s (1997) utility taxonomy is related to ‘wanting’ and ‘liking’, since remembered utility, experienced utility, and predicted utility refer to remembered liking, actual ‘liking’, and expected liking, while decision utility roughly corresponds to ‘wanting’ (e.g. Berridge,

⁴While ‘liking’ is caused in a limited number of hedonic hotspots in brain structures such as the nucleus accumbens or the posterior half of the ventral palladium, ‘wanting’ mechanisms are more numerous and widely spread in the brain (Peciña et al., 2006).

⁵The inverted commas indicate the core processes of motivation and hedonic pleasure in the brain. These core processes are different from the conscious perceptions of motivation and pleasure, i.e. wanting and liking without inverted commas. The unconscious core processes of motivation and hedonic pleasure, ‘wanting’ and ‘liking’, are necessary but not sufficient conditions for conscious wanting and liking. Whereas the conscious processes of wanting and liking are subjective in nature, the unconscious core processes of ‘wanting’ and ‘liking’ can be objectively measured by behavioral or neuroscientific methods.

2002; Berridge and Aldridge, 2008).

One area in the brain that has proven to be especially important for dissociating ‘wanting’ from ‘liking’ is the mesolimbic dopamine system (Berridge, 2007). In experiments with rats, manipulations of this dopamine-related mesolimbic brain system were shown to influence ‘wanting’ but not ‘liking’ (Ikemoto and Panksepp, 1999). When dopamine receptors in the brain were blocked, the running speed to a goal box containing sucrose solution, i.e. ‘wanting’, was significantly reduced. However, the rats’ intake of the sweet solution when the rats had already made it to the box, i.e. the ‘liking’, did not decrease. Consequently, it is argued that the neurotransmitter dopamine codes the incentive salience of rewards, i.e. how strongly rewards are ‘wanted’, not how much they are ‘liked’.⁶ When dissociating reward into motivational and pleasurable components, dopamine is responsible for the motivation to pursue rewards rather than how pleasurable rewards are perceived (Berridge, 2007).

It is striking that both the impulsive β parameter in the intertemporal neuroimaging studies (McClure et al., 2007, 2004) and reward ‘wanting’ correspond to activation of the mesolimbic dopamine system. This indicates that the impulsive β parameter is closer related to ‘wanting’ rewards than to ‘liking’ them. Thus, it might be the case that increased degrees of reward ‘wanting’ lead to the impulsive choices of smaller sooner rewards instead of larger later ones, although the latter are ‘liked’ more (Berridge, 2009; Berridge and Aldridge, 2008). However, if the β parameter is indeed closely related to ‘wanting’, what is the mechanism that increases the degree to which immediate rewards are impulsively ‘wanted’?

4.4 Cue-triggered ‘wanting’

This chapter follows Berridge and Aldridge (2008) and claims that a mechanism called cue-triggered ‘wanting’ is one potential microfoundation of the β parameter in the quasi-hyperbolic discounting model. Cue-triggered ‘wanting’ was first shown in rat experiments where the rats’ motivational reactions to auditory cues predicting sugar rewards were investigated (Wyvell and Berridge, 2000, 2001). These experiments show that the mesolimbic dopamine system is crucial for the motivation of rats to pursue sugar rewards. Those rats whose dopamine systems are activated work much harder for the cued

⁶This is contrary to the classical view that sees dopamine as the pleasure neurotransmitter coding ‘liking’. Other researchers argue that dopamine is more important in learning processes signaling prediction errors. For a discussion about the role of dopamine see Berridge (2007).

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sugar rewards than the rats with unchanged dopamine systems. Additionally, the authors find that ‘liking’ expressions (measured by typical facial reactions such as rhythmic lip-licking movements) do not differ for the two groups of rats. Accordingly, it is argued that in rats with activated dopamine systems the sugar cues trigger momentary motivational ‘wanting’ peaks, but do not influence the degree to which the rewards are ‘liked’. Hence, an essential aspect of cue-triggered ‘wanting’ is that it is characterized by a ‘wanting’–‘liking’ dissociation. Additional support for the possibility of such ‘wanting’–‘liking’ dissociations in rats comes from studies by Tindell et al. (2005). Tindell et al.’s (2005) findings rule out the possibility that cues increase the degree to which sugar rewards are expected to be liked (and therefore also ‘wanted’). To the contrary, Tindell et al. (2005) find that activation of the mesolimbic dopamine system increases cue-triggered ‘wanting’, but does not change the effect that cues have on liking expectations. Thereby cue-triggered ‘wanting’ is disentangled from cue-triggered changes of liking expectations (Tindell et al., 2005). The described rat experiments suggest that the synergy of (1) the activation of rats’ mesolimbic brain systems, and (2) the perception of certain reward cues can induce cue-triggered ‘wanting’ characterized by ‘wanting’–‘liking’ dissociations (Berridge and Aldridge, 2008). More precisely, Berridge and colleagues argue that an activated mesolimbic dopamine system can imbue reward cues with incentive salience (‘wanting’). When mesolimbic activation coincides with the perception of reward cues, these cues can trigger strong motivational reactions and make the cued rewards highly ‘wanted’.

Humans, of course, are not rats. Hence, to explain impulsivity in humans, the cue-triggered ‘wanting’ mechanism found in rats has at least to be adjusted. Nevertheless, also certain similarities between human and animal behavior can be assumed, especially for human behavior that is governed by the impulsive decision making System 1. Humans, just like other animals, have brain dopamine systems that interact with cues and can foster impulsivity. In humans, states of mesolimbic activation frequently correspond to need deprivation states such as hunger, thirst, drug addiction, and many emotional situations that can either be rewarding or stressful (Berridge, 2002; Berridge and Aldridge, 2008). Essentially, most of these states of mesolimbic activation correspond to the visceral influences already described by Loewenstein (1996). Consequently, Berridge (2002) suggests that cue-triggered ‘wanting’ is one specific mechanism of how visceral factors induce impulsivity in intertemporal choices.⁷

⁷Note that even if unconscious ‘wanting’ that exceeds unconscious ‘liking’ may be the reason for many impulsive decisions, on the conscious level wanting and liking do not necessarily have to be perceived as dissociated. Individuals may often rationalize their behavior to themselves in the sense that they explain their urges by, for example, arguing

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In humans, cues that can trigger ‘wanting’ can occur in many different ways. Generally, every stimulus that can be perceived somehow has the potential to become a cue. Also the perception of a reward itself can trigger impulses. However, compared to animals, humans live in a much more complex world, perceive more cues at each point in time, and are driven by various states of mesolimbic activation. Therefore, a third factor capturing the knowledge about which goods are appropriate to satiate which needs has to be added to understand impulsivity in human life. This third factor will be called consumption knowledge. That is, consumption knowledge contains the implicit or explicit knowledge or beliefs about which goods satiate which needs. However, even when need deprivation states, reward cues, and consumption knowledge coincide and increase the motivation to obtain immediate rewards, in humans this increased motivation does not necessarily induce impulsive decisions. Humans are not totally prone to their urges. By the use of willpower, humans can control themselves and neutralize the impulsive motivations. Self-control, which is a resource that can get depleted so that urges tend to influence decisions more frequently (Baumeister et al., 1998; Vohs and Faber, 2007), has to be considered as a fourth factor to understand (non-)impulsivity in human beings.

Summing up, cue-triggered ‘wanting’ can increase the motivation to obtain an immediately available reward independent of pleasure expectations, when individuals (1) are currently in a need deprivation state, (2) perceive a cue associated with an immediately obtainable reward, (3) know or believe that the cued reward is able to reduce the current need deprivation state, and (4) do not control themselves perfectly. As an example, consider an individual who has decided to reduce his or her consumption of junk food (smaller sooner rewards) in order to keep up a healthy lifestyle (larger later reward). Consider furthermore that this individual, after a long and exhausting day at work, is hungry and catches sight of a pizza delivery car on his/her way home. The individual knows that there is a supermarket around the corner that sells frozen pizza. In the individual, the sight of the pizza delivery car triggers an impulsive ‘want’ to buy and eat this pizza. However, the sight of the car does not change how much the individual ‘likes’ or expects to like the pizza. Hence, if the individual defers to the pizza urge triggered by the delivery car, this decision is likely to be characterized by a ‘wanting’–‘liking’ dissociation.

that they always expected to like the impulsively bought rewards. Also note that cue-triggered ‘wanting’ is different from miswanting (Gilbert and Wilson, 2000). Whereas in miswanting individuals wrongly expect to like rewards, cue-triggered ‘wanting’ can make rewards ‘wanted’ although these are not even expected to be liked.

4.5 The incentive salience model

In this section we integrate the cue-triggered ‘wanting’ mechanism into an otherwise standard discounted utility model. More precisely, we suggest that the impulsive decision making System 1 is essentially characterized by cue-triggered ‘wanting’. Compared to the quasi-hyperbolic discounting model, we substitute the β parameter by the cue-triggered ‘wanting’ mechanism. We will call the new model the incentive salience model of intertemporal choice. This model is inspired by the neural computational model presented by Zhang et al. (2009) which, however, had other aims and another focus.

The incentive salience model considers temporal prospects (c_t, \dots, c_T) , where c_t denotes the consumption of a given good c that takes place with certainty at time t . Motivational values (or the incentive salience) of temporal prospects are denoted by V . When temporal prospect i obtains a higher motivational value than temporal prospect j , this is depicted by $V_i \succcurlyeq V_j$; when both prospects have the same motivational value $V_i \sim V_j$ holds.⁸ In the incentive salience model, the motivation V to accept a temporal prospect (c_t, \dots, c_T) is determined by two components. The first component refers to the sum of pleasures that the consumption items are expected to offer. When individuals expect consumption items to be pleasurable ($r(c_t) > 0$), they will be motivated to obtain them. This is in line with standard expectancy value models where individuals want to consume those products they expect to like. Accordingly, the pleasure function $r(c_t)$ is continuous, strictly increasing, and $r(0) = 0$. The influence of expected liking on the motivation to consume is the result of standard reinforcement learning mechanisms. The motivation to consume is upgraded every time an individual recognizes that the pleasure the object offers is different from what the individual has expected it to be.⁹ Hence, the incentive salience value (\bar{V}) of a temporal prospect (c_t, \dots, c_T) is given by the sum of the expected future hedonic pleasures ($\bar{V} = E_t[\sum_{i=0}^T \delta^i r(c_{t+i})]$), where $\delta \in [0, 1]$ is the discount factor. This component of the incentive salience model corresponds to the standard discounted utility model.¹⁰

⁸Note that in common notation, \succcurlyeq depicts preferences (for example Prelec, 2004). However, in the incentive salience model, preferences are dissociated into motivational and pleasurable components and \succcurlyeq refers to the motivation to obtain a temporal prospect.

⁹In each period, pleasure estimates \hat{V} are based on computing a prediction error γ and correcting any experienced deviation of \hat{V} from consistent successive periods: $\gamma_t = r_t + \delta \hat{V}(s_{t+1}) - \hat{V}(s_t)$. Using this prediction error, the estimated pleasure \hat{V} is updated.

¹⁰As an alternative modeling approach, it would be possible to use a hyperbolic discounting model instead of the discounted utility model as the first component of the incentive salience model. However, as this chapter’s focus is on the integration the cue-triggered ‘wanting’ mechanism, we chose to stick to the simplifying assumption of the discounted utility model (see discussion in section 4.6).

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The second component that additionally determines the motivation to obtain a temporal prospect is situationally imposed cue-triggered ‘wanting’. As seen in section 4.4, cue-triggered ‘wanting’ contains four factors: a need deprivation state, a cue associated with an immediately obtainable reward, consumption knowledge, and (lack of) self-control. The need deprivation state is reflected by η_t . $\eta_t < 0$ indicates oversaturation (such as when the individual has eaten too much), and $\eta_t > 0$ represents deprivation (for example hunger). In this chapter, we will focus on the latter case. The perception of a cue is captured by the binary variable s_t , which is zero when no cue is perceived and unity in case of a cue perception. The explicit or implicit knowledge about which goods are appropriate to satiate which needs is captured by consumption knowledge (k_t ; $0 \leq k_t \leq 1$). Self-control (SC_t) that can neutralize the urges to impulsively obtain immediate rewards is bound between zero and unity ($0 \leq SC_t \leq 1$). Perfect self-control corresponds to $SC_t = 1$.

Hence, when individuals are in a need deprivation state ($\eta_t > 0$), perceive a cue ($s_t = 1$) that indicates the immediate availability of a pleasurable reward (c_t , with $r(c_t) > 0$), and know or believe that the need deprivation state can be reduced by the cued object ($k_t > 0$), cue-triggered ‘wanting’ increases the motivation to acquire an immediately obtainable consumption object. This increased motivation can induce behavioral changes when individuals do not perfectly control themselves ($SC_t < 1$). The simplest way to formalize cue-triggered ‘wanting’ is by a multiplicative function ($s_t \cdot k_t \cdot \eta_t$). When the product of the three variables is greater than zero, cue-triggered ‘wanting’ adds additional motivational power to the cued, immediately available reward. The motivation to obtain an immediately available reward including cue-triggered ‘wanting’ is depicted by $r(c_t)(1 + s_t \cdot k_t \cdot \eta_t)$, and the difference from $r(c_t)$ is the consequence of cue-triggered ‘wanting’. By the use of self-control, however, the effect of cue-triggered ‘wanting’ can be neutralized ($r(c_t)(1 + s_t \cdot k_t \cdot \eta_t \cdot (1 - SC_t))$), so that the motivation to obtain the temporal prospect again coheres with the sum of pleasure expectations. Without cue-triggered ‘wanting’ or with perfect self-control, there is a one-to-one relationship between the expected pleasure and the motivation to consume. When decisions are influenced by cue-triggered ‘wanting’, however, this coherence is suspended.

The overall motivation to acquire a temporal prospect including cue-triggered ‘wanting’ is reflected by $V(c_t, \dots, c_T)$. This motivation is determined by both the discounted liking expectations ($\bar{V} = E_t[\sum_{i=0}^T \delta^i r(c_{t+i})]$) and the combined effects of the current drive state η_t , the consumer knowledge k_t , the cue s_t , and non-perfect self-control ($SC_t \leq 1$). The motivation to consume a given

temporal prospect is

$$V(c_t, \dots, c_T) = E_t \left[r(c_t)(1 + s_t \cdot k_t \cdot \eta_t \cdot (1 - SC_t)) + \sum_{i=1}^T \delta^i (r(c_{t+i})) \right], \quad (4.2)$$

where $\delta \in [0, 1]$ is a constant discount factor. In the incentive salience model, cue-triggered ‘wanting’ ($s_t \cdot k_t \cdot \eta_t > 0$) reflects the influence of the impulsive decision making System 1. Cue-triggered ‘wanting’ increases the motivational weight put to immediate rewards relative to future rewards. The decision making System 2 is reflected by self-control (SC_t) as well as the part of the incentive salience model that mimics the discounted utility model. When the individual does not perceive a cue ($s_t = 0$), has no consumer knowledge ($k_t = 0$), is not in a need deprivation state ($\eta = 0$), or has perfect self-control ($SC_t = 1$), the model simplifies to the standard discounted utility model. When one of these conditions holds, decisions are solely the result of the reflective decision making System 2. On the other extreme, when degrees of deprivation become very high, the impulsive System 1 can become the dominant driver of decisions. In these cases the deprivation state η gets so great, that the relatively small values of discounted future rewards have almost no influence on the decision anymore. For most decisions, however, deprivation states are not strong enough to completely override cognitive deliberation. On the other hand, also the cognitive System 2 is not strong enough to completely neutralize urges occurring in the impulsive System 1. Hence, it seems best to model intertemporal decisions as being made by both systems simultaneously as it is done in equation (2).

Note that, in intertemporal decision models, preferences $U()$ over temporal prospects (c_t, \dots, c_T) are commonly represented by two components, namely a continuous, strictly increasing utility function $u(c_t)$ and a strictly decreasing discounting function $D(\theta)$ (with θ referring to the delay). In these models, preferences are depicted by the sum of expected utilities gained by present and future consumption, each weighted by a function of the delay. Hence, commonly $U(c_t, \dots, c_T) = \sum_{\theta=0}^T D(\theta) \cdot u(c_{t+\theta})$. The cue-triggered ‘wanting’ mechanism, however, is neither part of the discount function, nor does it belong to the utility that can be gained from consumption. Accordingly, the incentive salience model adds a conceptually different third component to the model. Consider, for example, an individual who has the choice between obtaining either c_t immediately or $c_t + \sigma$ in the next time period. At time t these choices correspond to the temporal prospects $(c_t, 0)$ and $(0, c_t + \sigma)$, respectively. In the incentive salience model, indifference between both motivations to obtain the temporal prospects, i.e. $V(c_t, 0) \sim V(0, c_t + \sigma)$, is

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characterized by $E_t[r(c_t)(1 + s_t \cdot k_t \cdot \eta_t \cdot (1 - SC_t))] = E_t[\delta r(c_t + \sigma)]$, or

$$\frac{E_t[r(c_t)(1 + s_t \cdot k_t \cdot \eta_t \cdot (1 - SC_t))]}{E_t[r(c_t + \sigma)]} = \delta. \quad (4.3)$$

On the one hand, this notation emphasizes that cue-triggered ‘wanting’, reflected by the term $(s_t \cdot k_t \cdot \eta_t)$, is separated from the discount factor δ . Cue-triggered ‘wanting’ occurs at the left-hand side of the equation and increases the motivational value of the immediately obtainable reward. It does not reduce the absolute value of future rewards by discounting them more strongly. Accordingly, in the incentive salience model, impulsivity can be seen as the desire for immediate gratification on top of the impatience that is already measured by the discount rate δ . The usefulness of measuring a single discount rate that lumps together impatience and impulsivity is thus scrutinized by the incentive salience model. On the other hand, equation (4.3) shows that, while cue-triggered ‘wanting’ increases the motivational value of immediately obtainable rewards, it does not affect the pleasure component of reward, i.e. $r(c_t)$ is independent from the parameters reflecting cue-triggered ‘wanting’. Consequently, cue-triggered ‘wanting’ can lead to the choice of the immediate reward ($V(c_t, 0) \succcurlyeq V(0, c_t + \sigma)$), although the later reward is expected to offer more (discounted) pleasure ($E_t[r(c_t)] < E_t[\delta r(c_t + \sigma)]$).

4.6 Discussion

The incentive salience model integrates insights from neighboring disciplines to the economic analysis of intertemporal choice. This integration has both costs and benefits. The main cost is the added complexity compared to, for example, the quasi-hyperbolic discounting model. While in the quasi-hyperbolic discounting model, impulsivity can be reflected by only one parameter (β), in the incentive salience model, four parameters (s_t , k_t , η_t and SC_t) are needed. This can generate problems for the empirical estimation of the incentive salience model, especially in the field where it is difficult to control for all of the four parameters. Whether adding complexity to a model is nonetheless warranted depends on the more complex model’s ability to explain not-yet understood empirical findings and the ability to provide new testable hypotheses. Regarding the latter, the incentive salience model provides new hypotheses that can be tested mainly in experiments. In experiments, it is possible to measure, manipulate, and control for the four parameters added in the incentive salience model. By holding constant three parameters and varying only one of them, it is possible to investigate the effects that each of the parameter has on impulsivity. In such controlled experiments, *ceteris*

paribus, the incentive salience model predicts more impulsivity when cues are perceived, consumption knowledge exists, the individuals are in a deprivation state, and the self-control resource is depleted. For example, the incentive salience model can inspire more research similar to that of Read and Van Leeuwen (1998), who find that hungry participants who have the choice between immediately obtaining a healthy or an unhealthy snack choose the unhealthy snack more often than participants who are satisfied.

Regarding the model's ability to explain not-yet understood empirical findings, in the following, the incentive salience model's ability to explain some known anomalies in intertemporal choice will be discussed. Behavioral economic research has identified several anomalies that cannot be explained by the traditional discounted utility model (Frederick et al., 2002). The incentive salience model can account for some, but by no means for all, of these anomalies. In the literature, the most commonly described anomaly in intertemporal choice is dynamic inconsistency. Individuals are patient when making plans for the future but act impatiently when the future becomes present. The incentive salience model suggests that additional to decreasing impatience when outcomes are delayed, also impulsivity can explain that preferences dynamically change from preferring larger later rewards to preferring smaller sooner ones. However, since impulsivity requires immediate availability of consumption objects, the incentive salience model can explain these dynamic inconsistencies only if the smaller rewards can be obtained immediately. Accordingly, the model can explain parts of present-biased preferences (O'Donoghue and Rabin, 1999), also known as the immediacy effect (Prelec and Loewenstein, 1991; Read et al., 1999). Since many self-control problems (smoking, drinking, binge eating, etc.) result from impulses rather than from decreasing impatience, the incentive salience model may be helpful to elaborate on self-control strategies in future work.

The immediacy effect is also reflected by the β parameter in Laibson's (1997) quasi-hyperbolic discounting model. Actually, when comparing the incentive salience model (equation 2) with the quasi-hyperbolic discounting model (equation 1), it becomes obvious that both models have essentially the same functional form (Zhang et al., 2009). The β parameter in the quasi-hyperbolic discounting model is substituted by the cue-triggered 'wanting' mechanism. However, only the incentive salience model provides a brain-based explanation for the fact that the impulsive desires to obtain smaller sooner rewards occur. While in the quasi-hyperbolic discounting model, the β parameter reflects ad hoc values that are chosen to fit the data, the explanation of impulsivity in the incentive salience model is inspired by neuroscientific and psychological findings. Cue-triggered 'wanting' might essentially be the (or more likely: one) mechanism causing the impulsivity reflected by the β parameter in the quasi-

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hyperbolic discounting model. This conjecture is in line with neural data. The neural correlates of both parameters reflecting impulsive decisions (i.e. β in the quasi-hyperbolic discounting model and η_t in the incentive salience model) involve active dopaminergic midbrain structures (the ventral striatum and the medial prefrontal cortex) (Berridge, 2007; McClure et al., 2007, 2004).

Another anomaly that can, at least partly, be understood by using the incentive salience model is the domain effect. The domain effect states that directly consumable rewards such as food and addictive substances are more rapidly discounted than for example money (Estle et al., 2007). The incentive salience model suggests that, rather than as a result of more rapid discounting, these directly consumable rewards are chosen impulsively. To the extent that this is indeed the case, the incentive salience model can explain the domain effect. Rewards such as food and addictive substances are related to deficiency needs that, when deprived, activate the mesolimbic dopamine system. To the contrary, rewards that are related to, for example, cognitive needs that do not correspond to mesolimbic activation are unlikely to be chosen impulsively. For example, it is rather unlikely to perceive a strong urge to buy basic body care (Dittmar and Bond, 2010). Hence, the incentive salience model adds a motivational perspective to the behavioral economic literature on intertemporal choice. Rather than solely focusing on how individuals choose impulsively, with the incentive salience model one can go beyond this decision theoretic perspective and also predict what the rewards are that tend to be chosen in an impulsive fashion (Witt, 2012). This allows, for example, a structured investigation of when self-commitment devices are sensible, thus complementing the research focusing on how self-commitments work in well specified cases.

However, the incentive salience model's ability to explain the domain effect hinges on a critical assumption that should be mentioned here. The incentive salience model assumes that each deprivation state, say η_{it} , increases the motivation to obtain its corresponding reward $r(c_{i,t})$ instead of any other reward $r(c_{j,t})$ with $i \neq j$. In other words, there are distinct η values for hunger, thirst, or drug addiction (Zhang et al., 2009). For example, when an individual is hungry, the sight of a pizza delivery car might trigger a 'want' to eat a pizza, while the sight of a glass of water does not increase the 'want' to drink in hungry individuals. However, it is not yet evident if specific need deprivation states can indeed induce impulsive choices only of those rewards that are able to satiate the currently deprived needs. It was shown that cross-domain spillover effects of 'wanting' can occur. Compulsive gamblers, for example, may also show other addictions (Zhang et al., 2009), male participants exposed to erotic pictures have a higher 'want' for money (Van den Bergh et al., 2008), and a salient need for distinctiveness increases the 'want' to eat (Berger and Shiv, 2011). Hence, mesolimbic activation of dopaminergic brain systems

induced by one of these need states might also increase the motivational value of any other cue. This would correspond to the idea that dopamine reflects a motivational “common currency” in the brain (c.f. Berger and Shiv, 2011). Future research should clarify to which extent deprivation states indeed induce higher ‘wanting’ only in the specific domains corresponding to the current need deprivation states.

Besides offering one possible explanation for the domain effect, the incentive salience model also allows accounting for parts of the magnitude effect (smaller rewards are more rapidly discounted than larger rewards). In the incentive salience model, current need deprivation states are decisive for the occurrence of strong desires for immediate gratification. Small rewards should be sufficient to reduce many of these current need deprivation states. For example, a smoker’s current craving can be reduced by a single cigarette; a carton of cigarettes is not needed. However, many smokers buy larger amounts of cigarettes, presumably driven by rather cognitive motives occurring in System 2 such as convenience and the anticipation of future cravings. While the craving for a single cigarette reflects mainly the motivational power of System 1, motivations to buy larger amounts are more cognitively driven and less likely to be influenced by cue-triggered ‘wanting’. That is, when large rewards are at stake, the cognitive System 2 tends to dominate decisions. To the contrary, when only small rewards are at stake, controlling oneself is less important and the impulsive System 1 might dominate the choices. Hence, individuals driven by System 1 might show higher discount rates for single cigarettes than for cartons of cigarettes.

Other anomalies, especially those where it is not decisive that an immediate reward is in the choice set, cannot be explained by the incentive salience model as presented in this chapter. Such anomalies include nonadditive discounting (Scholten and Read, 2010), common difference effects without immediate outcomes in the choice sets, and delay-speedup asymmetries (Loewenstein and Prelec, 1992). However, it is possible to combine the incentive salience model with other discounting models to account for some of these anomalies. To do so, the simplifying assumption of exponential discounting of future rewards can be replaced by, for example, hyperbolic discounting functions. As a result, impulsivity could be defined as the extreme desire for immediate gratification on top of the already myopic preferences modeled by a hyperbolic discounting function. However, as the strength of the incentive salience model is in explaining impulsivity, combining different models and accounting for both impulsivity and decreasing impatience could cause unnecessary complexity.

A related simplifying assumption the incentive salience model makes is that short-term fluctuations of need deprivation states influence only impulsivity. The effects of fluctuating need deprivation states on reward ‘liking’ and plea-

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sure expectations are not modeled, i.e. $r(c_t)$ is independent of η_t both in the present and in the future. Thus, it is implicitly assumed that the individuals' pleasure expectations are extrapolations of the pleasures that respective rewards have offered in the past. In real life, however, need deprivation states influence the pleasure that rewards provide and this effect can also be anticipated (Read and Van Leeuwen, 1998). For example, food tastes better when hungry and individuals know that. However, the effects of need deprivation states on the pleasure components of reward do not explain impulsivity. Impulsivity, defined as spontaneous, automatic, and without a lot of reflection (Rook, 1987), can better be explained by cue-triggered 'wanting'. As the chapter investigates dynamic inconsistencies arising from impulsivity, it seems justified to simplify in the sense that pleasure is not influenced by fluctuating need deprivation states.

Finally to conclude the discussion of the incentive salience model, some implications of understanding impulsivity as being characterized by 'wanting'-'liking' dissociations are stressed. First, the 'wanting'-'liking' distinction might explain why individuals underappreciate the effects that visceral states have on current and future behavior (Loewenstein et al., 2003). While consciously, rational individuals almost always want what they like and like what they want, unconsciously 'wanting'-'liking' distinctions can occur. Most individuals are not aware of these unconscious distinctions and thus it is hardly possible for them to anticipate preference reversals leading to choices of smaller sooner rewards. 'Wanting'-'liking' dissociations may thus partly explain why individuals are naive about future self-control problems (O'Donoghue and Rabin, 1999). Second, 'wanting'-'liking' distinctions might explain why individuals oftentimes regret their impulsive choices. Situational factors, for example in the store, might increase how much consumer goods are 'wanted' without changing how much the same goods are 'liked'. Purchasing a product without actually 'liking' the product sufficiently to make the purchase happen under normal circumstances is likely to induce regret. Such regret might then decrease discount factors in subsequent intertemporal decisions (Raeva et al., 2010). However, the idea that impulsive purchases can be characterized by 'wanting'-'liking' dissociations raises serious doubts about the applicability of the revealed preference approach to impulsive choices. Third, 'wanting'-'liking' distinctions may help understanding why certain needs are particularly difficult to be satiated. Economically, this is of particular interest with regard to higher order needs. Nettle (2005) argues that a slight rise of one's income or social status might be enough to engage the wanting-system, but not enough to induce higher degrees of pleasure or happiness (p.129).

4.7 Concluding remarks

This chapter presented the incentive salience model of intertemporal choice. This model follows dual process theories in distinguishing between an impulsive decision making System 1 and a reflective decision making System 2. The incentive salience model focuses on the impulsive system in that it integrates a brain-based explanation for impulsivity into an otherwise standard discounted utility model. Drawing on the dissociation of reward into ‘wanting’ and ‘liking’ components, the chapter argued that impulsive choices of smaller sooner rewards instead of larger later ones are induced by a mechanism called cue-triggered ‘wanting’. Cue-triggered ‘wanting’ occurs when need deprived individuals perceive cues that are associated with rewards known to satisfy the currently deprived needs. If not controlled by cognitive efforts, cue-triggered ‘wanting’ can induce impulsive choices of smaller sooner rewards instead of larger later rewards, although the latter are ‘liked’ more. The chapter suggested to observe need deprivation states, consumer knowledge, cues, and (lack of) self-control and to use these observations to experimentally test predictions regarding impulsivity made by the incentive salience model. Besides this predictive capacity, the incentive salience model offers possible explanations for present-biased preferences, the domain effect, and the magnitude effect. Moreover, implications of understanding impulsivity as characterized by ‘wanting’–‘liking’ dissociations were presented.

5 Impulsive consumption and reflexive thought: Nudging ethical consumer behavior

5.1 Introduction

Under the label libertarian paternalism behavioral economists have begun to draw policy implications from their findings (Thaler and Sunstein, 2003, 2008). Libertarian paternalism refers to policy interventions that change the context (in libertarian paternalistic terms, the choice architecture) in which individuals make decisions. Changing the choice architecture, libertarian paternalists argue, can nudge individuals to behave in their own best self-interests. One prominent example of a libertarian paternalistic intervention is to change the way in which food products in cafeterias are displayed and arranged in order to nudge individuals to choose products that make them better off, as judged by themselves (Thaler and Sunstein, 2008). Drawing on the assumption that products that are noticed first tend to be purchased more often than products in less favorable locations, Thaler and Sunstein (2008) suggest putting healthy fruits in the best locations and unhealthy junk food in less favorable places in order to nudge individuals towards healthy eating. Libertarian paternalists argue that such slight changes of the choice architecture are not paternalistic as commonly defined because mere changes of the choice architecture do not reduce the individual's freedom of choice. What Thaler and Sunstein (2008) do not explain in their cafeteria example, however, is why individuals tend to grab the first products they see. One possibility, actually the one which is presumed in this chapter, is that individuals choose the first products they see in an impulsive fashion. The aim of the chapter is to show that a thorough understanding of how and why impulsive consumption occurs can be used to evaluate and bring forward libertarian paternalistic ways of influencing (impulsive) consumer behavior.

Impulsive consumption, which occurs frequently in daily lives of modern citizens (Hofmann et al., 2012), is defined as the result of sudden and powerful urges that induce consumers to buy immediately without a lot of reflection about the long-term consequences of the purchases (Rook, 1987). Analogously, Hoch and Loewenstein (1991) suggest that impulsive consumption is

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the outcome of a struggle between desire and willpower (Hoch and Loewenstein, 1991). This conceptualization is closely related to recent behavioral economic models of impulsivity that understand human decision making as being guided by two different systems (Kahneman, 2011; Strack and Deutsch, 2004). Kahneman (2011) calls these two systems System 1 and System 2. While the desire corresponds to the urges that induce impulsive consumption and occur in System 1, the reflection about the long-term consequences takes place in System 2 and is closely related to willpower. In the struggle between desire and willpower, i.e. between System 1 and System 2, recent research in behavioral economics and economic psychology on impulsive consumption focuses on the mitigating effects of the latter (Baumeister and Tierney, 2011; Dewitte, 2012; Hofmann et al., 2009). Accordingly, practical implications following from this research mostly aim at strengthening the cognitive factors related to willpower that can reduce impulsive consumption by suggesting, for example, external commitment devices (Bryan et al., 2010). This chapter, on the contrary, expands on the desire that potentially leads to impulsive consumption. Hence, the chapter is in line with Hofmann et al. (2009) who suggest to put more emphasis on the desire side of the conflict between desire and willpower to obtain a more balanced perspective on impulsive consumption. In particular, the chapter presents the cue-triggered ‘wanting’ mechanism as one potential explanation for how and why urges to consume occur.

To elaborate on the differences between desire and willpower in the two systems the chapter investigates the roles played by the human capacity for reflexive thought. Reflexive thought facilitates, amongst other things, the abilities of self-focused attention and self-evaluation (Duval and Wicklund, 1972). Combined with the human ability of mental time-traveling (Suddendorf and Corballis, 2007), reflexive thought allows individuals to reflect about the consequences that impulsive consumption has for themselves in the future (Hershfield, 2011). Hence, reflexive thought helps in exerting self-control to resist existing urges that would otherwise lead to impulsive behavior. However, as Dittmar and Bond (2010) show, reflexive thought can also lead to impulsive behavior. Hence, besides playing a role in willpower, reflexive thought also plays a role in desire. More precisely, following Dittmar and Bond (2010), this chapter argues that motivational aspects of reflexive thought, i.e. identity-related needs commonly called self-image motives (Dunning, 2007), can generate desires that can lead to impulsive consumption. When, for example, individuals perceive discrepancies between their actual self-images and their ideal self-images, they sometimes impulsively purchase goods that promise to reduce these self-image discrepancies (Dittmar and Bond, 2010). Going beyond Dittmar and Bond’s (2010) analysis, this chapter argues that such impulsive purchases of identity-relevant goods can be explained by the cue-

triggered ‘wanting’ mechanism.

Utilizing the knowledge about both the cue-triggered ‘wanting’ mechanism and the different aspects of reflexive thought, the chapter presents implications for libertarian paternalistic interventions. On the one hand, the chapter argues that self-nudges should be preferred to nudges by third parties, because the subjective character of self-images makes it difficult for third parties to judge what makes individuals better off. If anybody knows which self-image is predominantly salient in an individual, it is the individual herself. On the other hand, by highlighting the motivational aspects of impulsive consumption and reflexive thought, some new nudging strategies emerge. These are presented in the context of ethical consumption. The chapter illustrates how nudges can be used to both reduce unethical impulsive consumption and increase ethical impulsive consumption. Essentially, three strategies through which choice architects (third parties, but preferably the individuals themselves) can nudge individuals towards an ethical way of impulsive consumption will be distinguished. First, individual willpower to guard against unethical impulsive consumption can be strengthened. Second, the desires for unethical impulsive consumption can be reduced. Third, impulsive consumption can be guided to ethical directions by making salient certain self-images that favor ethical consumption.

The rest of the chapter is organized as follows. Section 5.2 briefly presents some basic facts about impulsive consumption. Section 5.3 summarizes behavioral economic models of impulsivity, underscoring the roles that the two human decision making systems play in intertemporal decisions. Based on an evolutionary perspective on economic behavior, section 5.4 presents motivational aspects of impulsive consumption. Using the cue-triggered ‘wanting’ mechanism this section shows how self-image motives can induce impulsive consumption of identity-related goods. Subsequent to section 5.4, the chapter turns to the implications for policies in the spirit of libertarian paternalism. Section 5.5 offers a note of caution for those libertarian paternalistic policies that third parties apply to populations composed of individuals with diverse self-images. Section 5.6 presents three strategies by which choice architects (either third parties or the individuals themselves) can nudge individuals to make impulsive consumption more ethical. The last section concludes.

5.2 Impulsive consumption

There are various types of impulsive consumption. These include reminder impulsive consumption, suggestion impulsive consumption, planned impulsive consumption, and pure impulsive consumption (Stern, 1962). This chapter deals solely with the final type. Pure impulsive consumption results from sudden and powerful urges that induce consumers to buy immediately. These urges tend to occur spontaneously and without a lot of reflection about the long-term consequences of the purchase (Rook, 1987). The urge-like character of impulsive buying is also what distinguishes impulsivity from impatience. The latter, in contrast to impulsivity, does not need to be spontaneous, can involve reflection, and is not necessarily induced by urges. Recent technological innovations such as the possibility to purchase almost all consumer goods quickly and effortlessly in the Internet facilitate impulsive consumption. As a result of such developments, Vohs and Faber (2007) argue, the opportunities for impulse consumption in modern Western societies are ever-increasing. Using an experience sampling study Hofmann et al. (2012) find that desire is a common theme in the daily lives of modern citizens. Some consumption products are bought impulsively more often than others (Dittmar and Drury, 2000; Estle et al., 2007). While it is rather common that individuals buy, for example, food and clothes on impulse, other consumption objects such as basic body care items are almost never bought impulsively (Dittmar and Bond, 2010). Although impulsive consumption is not always seen as solely negative (Hausman, 2000), it is often associated with negative consequences such as financial problems, lower self-esteem, post-purchase dissatisfaction (Rook, 1987), as well as the high levels of consumer debt in the US (Vohs and Faber, 2007). The detrimental consequences of impulsive consumption have prompted calls for policy intervention (for example Seiders and Petty, 2004). One type of intervention is to change the choice architecture of tempting situations and to nudge individuals to change their impulsive behavior (Thaler and Sunstein, 2008). Such an intervention does not rely on coercion by, for example, using bans to achieve behavioral changes. To the contrary, changing the choice architecture preserves the individuals' freedom of choice. Accordingly, Thaler and Sunstein (2008) argue that from a libertarian perspective changes of the choice architecture should be preferred to prohibitive rules. However, achieving a behavioral change by changing the choice architecture is also likely to be more difficult than simply banning certain types of impulsive behavior. Hence, in order to effectively influence impulsive buying behavior knowledge about the processes underlying impulsive consumption is needed.

5.3 The behavioral economic perspective: Two systems

Recently, several behavioral economists and economic psychologists suggested theories explaining why individuals consume impulsively. In many of these theories, impulsive behavior is seen as the outcome of a struggle between two opposing forces, namely desire and willpower (Hoch and Loewenstein, 1991). This conception corresponds to recent behavioral economic research that envisions human behavior as driven by two different decision making systems (e.g. Kahneman, 2011). The first system, sometimes called System 1, roughly corresponds to intuitive decision making. It is quick, efficient, present-oriented, related to desire and emotion, and often relies on unconscious processes. The second system, called System 2, reflects what is usually meant by the word thinking. System 2 is slow, rule-based, controlled, and comprises the abilities of willpower and cognition. Other notations for the two systems include, respectively, the hot system and the cold system (Metcalf and Mischel, 1999), and impulsive and reflective mechanisms (Strack and Deutsch, 2004). Behavioral economics acknowledges that many economic decisions are guided by intuitions occurring in System 1. Kahneman (2011), for example, refers to the intuitive System 1 as the “hero” of his book summarizing his work in behavioral economics (p. 21). The intuitions in System 1 are sometimes biased and thus can explain why behavior diverges from rational benchmarks. Also urges to consume for example junk food occur in System 1 and lead to impulsive behavior when System 2 is not able to control System 1 in line with the plan of eating healthy.

In behavioral economic studies of intertemporal choice, one common formalization of the intrapersonal conflict between the two systems is Laibson’s (1997) $\beta\delta$ model. This model suggests that individuals’ intertemporal decisions can be described by a quasi-hyperbolic discount function ($D(\theta)$) with discount factors varying discretely over the delay θ after which rewards can be obtained ($D(\theta) = 1, \beta\delta, \beta\delta^2, \beta\delta^3, \dots$). This function implies that individuals have two separate discount factors corresponding to System 1 and System 2, respectively. Whereas δ corresponds to System 2 and discounts all future rewards with a constant rate per period, System 1, reflected by the β parameter, makes a sharp distinction between immediate rewards and future rewards: when an immediate reward is contained within the choice set, the reward in the next period is discounted by $\beta\delta$, but when both rewards occur in two successive periods in the future, the later reward is discounted only by δ (Laibson, 1997). The quasi-hyperbolic discount function is sup-

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ported by neuroeconomic studies (McClure et al., 2007, 2004).¹ Moreover, the quasi-hyperbolic discounting model has proven to be a good formal description of various cases of intertemporal choice. These cases contain the choices between watching a highbrow or a lowbrow film (Read et al., 1999), choices between healthy and unhealthy snacks (Read and Van Leeuwen, 1998), early retirement patterns of workers (Diamond and Köszegi, 2003), contract choices in health clubs (DellaVigna and Malmendier, 2006), and preferences for deadlines in homework assessments (Ariely and Wertenbroch, 2002) (see DellaVigna (2009) for a review).

The quasi-hyperbolic discounting model's success and the neuroscientific support suggest that intertemporal choices are indeed driven by the interaction of two distinct decision making systems, and that the respective brain areas indeed correspond to the two systems. However, acknowledging that the two systems correspond to distinctive brain areas does not yet explain how the two systems function. By using the quasi-hyperbolic discounting model, one can describe but not explain impulsive consumption. In order to provide such an explanation more insights are needed to understand what mechanisms correspond to β and δ , or System 1 and System 2, respectively. To understand impulsivity more thoroughly the factors that strengthen or weaken each of the two systems need to be elaborated upon (Camerer et al., 2005; Hoch and Loewenstein, 1991).

In intertemporal decisions, the major role of System 2 is to set long-term goals and make sure that these goals are achieved. Of great importance in this endeavor is the control of the myopic System 1. To control System 1 individuals need willpower. Baumeister and colleagues argue that willpower is similar to a resource that can get depleted (Baumeister, 2002; Baumeister and Tierney, 2011; Vohs and Faber, 2007). When willpower is depleted by prior exercise, individuals tend to engage in impulsive buying behavior more frequently. This depletion of willpower is not restricted to the domain in which the individuals have previously exerted self-control. Rather, when individuals exert self-control in one domain, the ability to delay gratification in other domains is also reduced. Self-regulatory fatigue or ego-depletion is one of the most frequently investigated subjects in social science (Baumeister and Tier-

¹These studies examined the neural correlates of intertemporal choice for primary and secondary rewards (McClure et al., 2007, 2004). Utilizing neuroimaging techniques (fMRI), the authors demonstrate that activation in areas that are heavily innervated with the dopaminergic midbrain system (the ventral striatum, the medial orbitofrontal cortex, and the medial prefrontal cortex) is associated with the β parameter, while activation in the lateral prefrontal cortex and posterior parietal cortex is associated with the δ parameter. However, there are also other neuroimaging studies that support a unitary system (e.g. Kable and Glimcher, 2007).

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ney, 2011, p. 2). With increasing frequency, explanations based on willpower and its depletion are also used by behavioral economists to understand self-control problems (Bucciol et al., 2011; Burger et al., 2011; Houser et al., 2008). Bucciol et al. (2011), for example, find that exposure to temptation depletes willpower and reduces economic productivity of young children.

Zhang and Shrum (2009) show that for the motivation to exert willpower, the individual capacity for reflexive thought is important. Due to this capacity, combined with the ability to engage in mental time traveling (Suddendorf and Corballis, 2007), individuals can appreciate the positive and negative effects that current consumption has for themselves in the future. When individuals expect their future selves to be similar to their present selves, using willpower and delaying gratification is easier for them (Bartels and Urminsky, 2011; Hershfield, 2011). Hence, it can be argued that reflexive thought is essential for the exertion of self-control. Supporting this point, Baumeister and Tierney (2011) argue that “willpower without self-awareness is as useless as a cannon commanded by a blind man” (p. 114).

Besides the depletion of willpower, also the degree of cognitive load influences the exertion of self-control (Shiv and Fedorikhin, 1999). Individuals with high cognitive load tend to control themselves less strongly than individuals with low cognitive load. Hence, cognitive load increases the likelihood of impulsive choices. Shiv and Fedorikhin (1999) show that individuals who have to memorize a seven-digit number are more likely to impulsively choose an unhealthy cake, instead of a fruit salad, than individuals who are made to memorize only a two-digit number. Other factors that influence the exertion of self-control include alcohol, stress, and sleep deprivation (Camerer et al., 2005). Moreover, consumer behavior tends to be more controlled when the to-be-consumed goods are personally important, and when consumers can be held accountable for their choices (Strack et al., 2006).

Research that focuses on the role that System 2 plays in intertemporal choices is helpful in understanding why individuals are, in general, more impulsive when they lack willpower. This has been greatly beneficial by suggesting ways how individuals can increase their willpower and thereby reduce the influence of impulsive urges on their behavior (see section 5.6). However, presumably due to this focus on willpower, behavioral economics has so far failed to offer explanations for other aspects of intertemporal choice. For example, an explanation for the domain effect has not been given so far. That is, it is difficult to explain why only certain goods, such as junk food, sweets, tobacco, alcohol, fashionable clothing, watches, and some cars, tend to be bought impulsively when individuals lack willpower (Dittmar and Bond, 2010; Dittmar and Drury, 2000; Estle et al., 2007; Frederick et al., 2002; Loewenstein, 1996). More generally, the focus on factors that influence the top down

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control from System 2 over System 1 lacks a motivational perspective that could address motivational questions regarding what goods are consumed impulsively (Heatherton and Wagner, 2011).² Such a motivational perspective investigates the role played by System 1 in intertemporal choice.

System 1's role in intertemporal choices has gained less attention than that of System 2 (Dewitte, 2012; Hofmann et al., 2009).³ Commonly, it is assumed that System 1 is myopic and strives for immediate gratification. However, reasons are rarely given as to why this is the case, and basic facts about desire and motivation remain unexplored (Hofmann et al., 2012, 2009). Sometimes, the striving for immediate gratification is related to the desire to behave in a hedonically pleasing manner (Rook, 1987; Shiv and Fedorikhin, 1999). Along these lines it is assumed that only products that are hedonically pleasing can induce urges to consume impulsively. For example, impulsive choices of hedonically appealing (but unhealthy) cakes instead of healthy salads as in Shiv and Fedorikhin (1999) are explained by the hedonic character of the cakes. That a product is hedonically appealing, however, is not sufficient to explain why strong visceral urges to consume occur and make System 1 myopic. Many products are hedonically appealing but do not induce such urges to consume impulsively. Moreover, it is not obvious what makes a product hedonically appealing. What is needed is a mechanism that explains why System 1 becomes myopic from time to time.

Another potential explanation for impulsive consumption is suggested by Hoch and Loewenstein (1991). They argue that already a few moments before the actual consumption act individuals regard the soon-to-be-purchased products as belonging to them. Hence, the individuals' reference points shift from not mine to mine. When the individuals nevertheless refrain from the purchase, they feel as though they have lost the product. Together with the tendency to put more weight on losses than on gains (Kahneman and Tversky, 1979) reference point shifts offer a potential explanation for urges that sometimes lead to impulsive consumption. However, given that there is no reason to assume that the degree of loss aversion differs across product do-

²This is in line with the general tendency of psychology and behavioral economics to focus on cognition. Hofmann et al. (2012), for example, argue that if all psychological phenomena can be characterized in terms of motivation and cognition, then the current psychological literature is unbalanced in the sense that much more effort is devoted to understanding cognition than it is devoted to understanding motivation.

³The attention devoted to System 1, however, is slowly increasing. Schmeichel et al. (2010), for example, present first evidence that exercising self-control can also influence System 1 by increasing approach-motivation. Redden and Haws (2012) show that satiation, i.e. the speed with which liking declines while eating, influences the desire to eat unhealthy and not only the ability to exert self-control. Hofmann et al. (2012) show that desire is a common theme in the daily lives of modern citizens.

5.4 Motivational foundations of impulsive behavior

mains, reference point shifts do not explain why impulsive consumption occurs only selectively in some consumption domains. Nevertheless, this explanation has been beneficial in, for example, making sense of Metcalfe and Mischel's (1999) finding that sudden increases in physical or sensory proximity induce impulsivity.

In later papers, Loewenstein elaborates on the tendency of System 1 to become myopic and suggests that visceral influences can induce impulsive behavior (Loewenstein, 1996, 2000). He argues that the sensory proximity of rewards together with the activation of visceral influences cause individuals to act more impulsively. Visceral influences include three main categories, namely drives (such as hunger and sexual desire), emotions (such as anger and fear), and somatic sensations (such as pain). Visceral influences put the individuals in hot states and thus produce short-sighted impulsive behavior. Due to hot-cold empathy gaps, such short-sighted behavior is not anticipated (Loewenstein, 1996). Visceral influences mainly influence intuitive decision making in System 1 and sometimes overwhelm the rational forward-looking goals set in System 2 during cold states. The theory of visceral influences has received much attention in various disciplines; for example in economics, it has been adopted in dual process models (Bernheim and Rangel, 2004). In line with Hofmann et al. (2009), this chapter argues that focusing on System 1 is a good strategy to obtain more insights about what drives impulsive consumption and to obtain a more balanced understanding of intertemporal choice.

5.4 Motivational foundations of impulsive behavior

Recent approaches within behavioral economics have begun to ask for the motivations underlying economic behavior. Kahneman et al. (1997) understands economic behavior as being driven by hedonistic, utilitarian motives, i.e. by the enjoyment of pleasure and the avoidance of pain. However, by taking an evolutionary perspective on economic behavior, one can go beyond this conception of sensory utilitarianism (Witt, 2001, 2012). Witt suggests that pleasure and pain can be understood in terms of changing need deprivation states, where pleasure is attributable to reductions of need-deprivation states, and pain relates to increases in these states. As most needs are motivational dispositions inherited through evolution, a finite set of universal human needs can be identified. As a result, insights from biology and motivational psychology can be utilized to inquire more deeply into individual preferences to

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understand what it is that induces pleasure or reduces pain and thus motivates behavior. In addition to these motivational dispositions, also cognitive and social dispositions were acquired by early humans during natural evolution and have strong effects on human behavior until today. These motivational, cognitive, and social dispositions interact with each other in various ways. For example, through innate learning mechanisms over time individuals associate reductions of need-deprivation states with certain consumption activities. These associations are stored in memory and Witt (2001) calls them consumer knowledge. As a consequence of these learned associations, need-deprivation states motivate those types of consumer behavior that were learned to reduce the current need-deprivation states (Witt, 2001).

The motivations underlying consumer behavior can be cognitive or intuitive in nature. When, for example, individuals buy insurances, these decisions are likely to be motivated by safety considerations and almost certainly the result of cognitive deliberation in System 2. To the contrary, the motivation to purchase, for example, immediately consumable food items can occur intuitively, i.e. without cognitive interference, in System 1 as this motivation is the result of homeostatic processes.⁴ Witt (2001) subdivides the intuitive form of motivation into basic needs and acquired wants and argues that these two motivational instances correspond to finite subsets of primary and secondary reinforcers in behavioral approaches, respectively. Using this classification, the chapter argues that the effects of innate motivational dispositions are most obvious when basic needs are considered. In their life courses individuals constantly acquire new wants and develop cognitive motives that show a great deal of variation across individuals (Witt, 2001). Thus, it is difficult to analyze preferences in the level of whole populations. Although the means by which individuals learn new wants and cognitive motives are also the result of biological evolution so that some similarities are likely to emerge also across individuals, it is still difficult to predict the content of acquired wants and cognitively determined motives by using evolutionary reasoning. Therefore, the chapter suggests that the strength of an evolutionary perspective on economic behavior lies in the analysis of those motives or preferences that are related to primary reinforcers closely corresponding to the intuitive System 1. As System 1 is also where urges to consume arise, an evolutionary perspective using insights from, for example, biology should be particularly valuable for an analysis of the motivational foundations of impulsive consumption.

In the following, the chapter presents recent biopsychological findings that

⁴In both cases, however, cognition plays a role in determining the means by which either cognitive or intuitive types of motivation can be satiated. Moreover, the motivation to consume food items can also be cognitive in nature.

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emphasize the importance of basic need deprivation states for an explanation of impulsive behavior. These findings suggest that the role of need deprivation states in impulsive behavior can be understood using a mechanism called cue-triggered ‘wanting’. Essentially, cue-triggered ‘wanting’ can be seen as a specific means by which Loewenstein’s (1996) visceral factors, including need deprivation states, can induce impulsive behavior (Berridge, 2002). The cue-triggered ‘wanting’ mechanism is based on the dissociation of reward into ‘wanting’ (the core process of motivation) and ‘liking’ (the core process of hedonic reward).⁵ In System 1 and System 2, different forms of motivation and hedonic reward occur. In System 2, cognitive forms of wanting and liking (without inverted commas) can be consciously perceived and evaluated. When guided by System 2, individuals almost always want what they like and like what they want so that wanting and liking typically cohere. In System 1, however, in some specific situations the unconscious core processes of ‘wanting’ and ‘liking’ (with inverted commas) can diverge (Berridge, 1999).⁶

The cue-triggered ‘wanting’ mechanism suggests that the perception of certain cues can make the cued rewards strongly ‘wanted’, although the perception of the same cues does not change the degree to which individuals expect to like the rewards. Moreover, these cues do not change the degree to which the individuals actually ‘like’ the rewards when they are eventually consumed (Berridge, 2002, 2012; Berridge and Aldridge, 2008). Hence, the cue-triggered increases of the motivation to consume can induce impulsive decisions that are characterized by gaps in ‘wanting’ and ‘liking’.⁷ Cue-triggered ‘wanting’ can occur when individuals perceive stimuli or cues that were previously asso-

⁵‘Liking’ refers to hedonic pleasure and not to other types of well-being such as eudaimonic well-being (Ryan and Deci, 2001).

⁶The dissociation between ‘wanting’ and ‘liking’ has already been recognized in behavioral economics. Applications of the ‘wanting’–‘liking’ dissociation include the explanation of addiction (Bernheim and Rangel, 2004), impulsive preferences for faces (Dai et al., 2010), the effects of failures (Litt et al., 2010), and implications for paternalistic interventions in addiction and credit card spending (Camerer, 2006). Also the utility terminology by Kahneman et al. (1997) is closely related because experienced utility and decision utility refer to ‘liking’ and ‘wanting’, respectively (e.g. Berridge, 2002; Berridge and Aldridge, 2008; Kahneman et al., 1997). In Gilbert and Wilson’s (2000) miswanting, dissociations between the motivation to consume and the pleasure obtainable from consumption emerge from prediction errors, while the mechanism presented here describes ‘wanting’–‘liking’ dissociations at the same point in time irrespective of prediction errors.

⁷Using Kahneman et al.’s (1997) terminology, cue-triggered ‘wanting’ can thus lead to a situation where decision utility is higher than both predicted utility and actually experienced utility. Berridge (2012), for example, writes that “it is possible to ‘want’ what is not expected to be liked, nor remembered to be liked, as well as what is not actually liked when obtained” (p. 1125). See also Lades (2012) for a summary of the experimental findings that lead to the conceptual distinction between ‘wanting’ and ‘liking’.

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ciated with immediately available consumption goods.⁸ However, these cues can increase ‘wanting’ to consume only when individuals are currently deprived in a strong physiological or psychological need that corresponds to an activation in the brain’s mesolimbic dopamine system. Moreover, the cues trigger ‘wanting’ to consume only when individuals explicitly or implicitly know that the cued consumption goods are able to satiate the currently deprived need.⁹ Accordingly, when individuals (a) are in a state of mesolimbic activation, (b) perceive cues that are associated with immediately available consumption goods, and (c) know that these consumption goods can satiate the currently deprived needs that induced the mesolimbic activation, the cues can trigger impulsive ‘wanting’ to consume. When these three factors coincide, the mesolimbic dopamine system attributes incentive salience to the cued rewards which makes them strongly ‘wanted’ without changing the degree to which the rewards are expected to be liked or actually ‘liked’ when they are consumed (Berridge, 2002; Berridge and Aldridge, 2008). When not effectively self-regulated by willpower, cue-triggered ‘wanting’ translates into impulsive consumption.

In Lades (2012), the cue-triggered ‘wanting’ mechanism is integrated into an otherwise standard discounted utility model. Lades (2012) adapts the quasi-hyperbolic discounting model and suggests that the motivation $V(c_t, \dots, c_T)$ to consume a given a temporal prospect (c_t, \dots, c_T) can be formalized as

$$V(c_t, \dots, c_T) = E_t \left[r(c_t) (1 + s_t \cdot k_t \cdot \eta_t \cdot (1 - SC_t)) + \sum_{i=1}^T \delta^i (r(c_{t+i})) \right], \quad (5.1)$$

where $r(c_t)$ depicts the reward obtainable from consuming the good c_t , the binary variable s_t is the cue, k_t ($0 \leq k_t \leq 1$) the consumer knowledge, $\eta_t > 0$ the need deprivation state, SC_t ($0 \leq SC_t \leq 1$) the self-control resource, and $\delta \in [0, 1]$ a constant discount factor. Cue-triggered ‘wanting’, reflected by $(s_t \cdot k_t \cdot \eta_t) > 0$, increases the motivational weight put to immediately obtainable rewards relative to future rewards. When, for example, an individual is very hungry ($\eta_t > 0$), the sight of a pizza-delivery car ($s_t = 1$) can trigger a strong urge to ‘want’ pizza which is known to be immediately available ($k_t > 0$), although the sight of the car does not change how much the pizza is expected to be liked or actually ‘liked’ during consumption (that is, $r(c_t)$

⁸Pictures of these consumption goods that do not indicate immediate availability of the real rewards are not sufficient (see Shiv and Fedorikhin, 1999).

⁹The role of this consumer knowledge is twofold. On the one hand, it contains the associations of cues to rewards (when the rewards are not themselves the cues). On the other hand, it involves the knowledge that certain rewards are related to certain visceral states.

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is not influenced by the cue).¹⁰ As a result, the model suggests that cues can make individuals prefer (in terms of ‘want’) smaller immediately available rewards, for example pizza, to larger later rewards, such as keeping up a healthy lifestyle, although the individuals expect to like (and actually ‘like’) the discounted larger later rewards more than the smaller immediately available rewards. This is a behavior Berridge (2002) calls irrational ‘wanting’.

The cue-triggered ‘wanting’ mechanism provides one possible explanation for how and under which circumstances visceral influences can lead to impulsive desires. Compared to Loewenstein’s (1996) theory of visceral influences, however, the explanation based on cue-triggered ‘wanting’ has at least one major strength. With the cue-triggered ‘wanting’ mechanism it can be explained why only some goods, and not others, tend to be bought impulsively. That is, cue-triggered ‘wanting’ offers an explanation for the domain effect in intertemporal choice.¹¹ Only those consumption goods closely related to strong and salient need deprivation states that activate the brain’s mesolimbic dopamine system are appropriate objects for cue-triggered ‘wanting’. States that activate the mesolimbic brain system and where previously shown to influence ‘wanting’ include sexual deprivation (Dai et al., 2010), hunger (Berridge et al., 2010), and the craving for drugs (Robinson and Berridge, 2008).¹² However, in addition to these physiological drive states, also psychological need deprivation states can activate the mesolimbic dopamine system and possibly induce

¹⁰Besides influencing incentive salience motivation, need deprivation states also alter the hedonic aspects of reward. Individuals evaluate, for example, a pizza as tasting better when they are hungry than when they are satiated (Read and Van Leeuwen, 1998). Hence, in Eq. 5.1, η_t can have an effect the enjoyment of consumption $r(c_t)$. However, the model presented in Eq. 5.1 aims at formalizing the role of impulsivity in intertemporal decisions. Changes in the (predicted) enjoyment do not lead to impulses in the sense of the cue-triggered ‘wanting’ mechanism. Accordingly, the chapter follows Lades (2012) by arguing that the effect of mesolimbic activation (η_t) on the enjoyment of consumption ($r(c_t)$) is not decisive for the explanation of impulsivity.

¹¹However, this is true only to the extent that each state of mesolimbic activation increases the motivation to obtain its corresponding reward and does not increase the motivation to obtain other rewards. However, it is still an open question whether this assumption is warranted (see Berger and Shiv (2011); Van den Bergh et al. (2008); Wadhwa et al. (2008); Zhang et al. (2009), and Berridge (2012) for a neuroscientific discussion in favor of the assumption of directionality). See also Lades (2012) for a more detailed discussion about the costs and benefits of the integration of the cue-triggered ‘wanting’ mechanism into intertemporal choice models.

¹²Drug addiction, in contrast to drug craving, does not activate the mesolimbic dopamine system but sensitizes it (Robinson and Berridge, 2008). Activation and sensitization, however, have similar effects: when certain reward cues are perceived, the mesolimbic brain system can make the rewards strongly ‘wanted’. Since, however, sensitization lasts longer than activation, sensitization can explain why former drug addicts relapse although they do not perceive cravings anymore that activate the mesolimbic dopamine system.

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impulsive behavior (Berridge and Aldridge, 2008).

Vohs and Faber (2007) relate ‘wanting’–‘liking’ dissociations to the human ability to exert self-control by the use of willpower. They suggest that when individuals are low on willpower and have depleted their self-regulatory resources, ‘wanting’–‘liking’ dissociations and impulsive buying might occur more often. Ego-depleted consumers might be more prone to the unconscious influences of motivation and hedonic reward and, hence, more strongly driven by urges characterized by ‘wanting’ without expected liking (Vohs and Faber, 2007). In the following, the chapter suggests that not only the cognitive aspects of reflexive thought, i.e. willpower and self-control, can be related to the ‘wanting’–‘liking’ dissociation. Also motivational aspects of reflexive thought can be related to the cue-triggered ‘wanting’ mechanism and thereby help to understand certain facets of impulsive consumer behavior.

The motivational aspects of reflexive thought are prominent in identity-related needs, commonly called self-image motives (Dunning, 2007; Sedikides and Strube, 1997).¹³ Due to their capacity for reflexive thought, individuals can think about themselves and these thoughts can evoke emotions as well as motivational power (Duval and Wicklund, 1972). Individuals perceive and evaluate themselves, create images of themselves, and favor certain self-images over others. Individuals can perceive themselves at different levels (personal, relational, and social), and these different self-image levels coexist in a given individual, able to be activated at different times and in different contexts (Markus and Wurf, 1987). To evaluate themselves individuals use their ideal self-images as reference standards. Differences between how the individuals ideally want to be (normative, ideal, or ought self-images) and how they actually view themselves (descriptive or actual self-images) lead to psychological discomfort (Higgins, 1987). This discomfort induces the desire to reduce these self-image discrepancies. The self-image motive to favor positive self-images over less positive ones, i.e. the tendency to reduce self-image discrepancies, is called self-enhancement (e.g. Sedikides and Strube, 1997). Self-image motives operate in both the intuitive System 1 and the cognitive System 2 (Devos and Banaji, 2003). Explicit self-reflections can consciously alter behavior when one is not happy with one’s self-perception. However, individuals are usually not aware of the fact that their decisions are partly driven by self-image discrepancies. Thus, self-images can affect behavior implicitly in a way that is automatic, beyond the individual’s control, and below the individual’s conscious awareness (Devos and Banaji, 2003; Dunning, 2007; Rameson et al.,

¹³In economics, there is a small but growing literature that integrates the importance of self-images in the economic analysis (Akerlof and Kranton, 2000; Benabou and Tirole, 2002; Brekke et al., 2003; Davis, 2007; Fine, 2009; Johansson-Stenman and Martinsson, 2006; Koeszegi, 2006).

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2010).

One way to reduce self-image discrepancies is to search for information that increases the positivity of one's actual self-image. Such information can be obtained by consuming products with symbolic, identity-relevant meanings that are congruent with one's ideal self-images (Sirgy, 1982). Individuals consciously or unconsciously expand their personal core selves to include certain possessions and, after this expansion, regard their possessions as being parts of themselves. By incorporating the symbolic meanings of identity-relevant goods into their self-images, individuals can signal to themselves and to others who they are (Belk, 1988). Hence, when an individual consumes a good with an identity-relevant symbolic meaning that is congruent with the individual's ideal self-image, the individual can move closer to her ideal self-image and thereby at least temporarily satisfy her need for self-enhancement. Wicklund and Gollwitzer (1982) call this behavior symbolic self-completion and show, for example, that business students who lack good qualifications display more material symbols than students with better career prospects. More recently, Gao et al. (2009) show that threats to important self-images can momentarily shake one's confidence in the respective self-image and thus alter consumer preferences. When, for example, individuals write an essay about their intelligence with their non-dominant hand, their self-image of being intelligent is threatened and they tend to prefer pens over candy (Gao et al., 2009).

Self-image motives or identity-related needs are likely to play a role in many consumption decisions for goods that have a symbolic meaning (Dunning, 2007). Previous research, however, suggests that self-images are involved in impulsive consumption to a larger extent than in "ordinary" buying (Dittmar and Bond, 2010; Dittmar and Drury, 2000; Verplanken and Sato, 2011; Zhang and Shrum, 2009). Dittmar and Bond (2010), for example, show that consumer goods with high identity-expressive potential (clothes, jewelry, sports gear) elicit a stronger tendency for impulsive buying behavior than consumer goods lacking this feature. This effect, however, is present only for individuals with materialistic world-views and salient self-image discrepancies at the moment of the consumption decision. Dittmar and Bond (2010) define individuals with materialistic world-views as having the beliefs that the accumulation of consumer goods is a central life goal and a key to happiness. These individuals hence believe that consuming identity-relevant products is a proper way to satiate currently deprived identity-related needs.

The findings by Dittmar and Bond (2010) are compatible with the explanation of impulsive consumption based on the cue-triggered 'wanting' mechanism. An essential requirement for cue-triggered 'wanting' to occur is mesolimbic activation in the brain. As mesolimbic activation does not only occur during physiological need deprivation states, but also in many emotional situ-

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ations that can be either rewarding or stressful (Berridge and Aldridge, 2008), self-image discrepancies are also likely to be able to induce cue-triggered ‘wanting’. As a second requirement for cue-triggered ‘wanting’ to occur, individuals have to implicitly or explicitly know that the identity-related goods can reduce their self-image discrepancies. This holds true only for individuals with materialistic world-views. Hence, this chapter suggests that when materialistic individuals have self-image discrepancies, i.e. are deprived of an identity-related need, the perception of cues associated with identity-relevant consumption goods can induce a ‘want’ to consume these identity-relevant goods. Adapting the incentive salience model (Eq. 5.1) to the case of identity-related consumption leads to the following formulation of the individual’s motivation $V(c_t, \dots, c_T)$ to consume a temporal prospect (c_t, \dots, c_T) where at least c_t is an identity-relevant consumption good:

$$V(c_t, \dots, c_T) = E_t \left[r(c_t) (1 + s_t \cdot M_t \cdot f(ISI_t - ASI_t) \cdot (1 - SC_t)) + \sum_{i=1} \delta^i (r(c_{t+i})) \right], \quad (5.2)$$

where s_t is the cue, M_t the materialistic world-view, ISI_t the ideal self-image, ASI_t the actual self-image, SC_t the self-control resource, and $\delta \in [0, 1]$ a constant discount factor. When cue triggered ‘wanting’ occurs ($s_t \cdot M_t \cdot f(ISI_t - ASI_t) > 0$) and is not controlled perfectly ($SC_t < 1$), the motivation to buy an immediately available identity-relevant good may exceed the degree to which the individual expects to like, or actually ‘likes’, the good. Consequently, cues can cause individuals to impulsively ‘want’ identity-relevant goods, although the cues do not change the degree to which the goods are expected to be liked or actually ‘liked’ after or during the purchase.¹⁴ For example, when an individual’s actual self-image falls short in a social comparison with an ideal self-image adopted from the mass media, the individual explicitly or implicitly perceives a discrepancy between who s/he ideally wants to be and who s/he actually is. When such a self-image discrepancy is salient and the individual has a materialistic world-view, in the case where s/he perceives some fashionable clothes that correspond to his or her ideal self-image, this perception induces the ‘want’ to immediately buy the clothes. The perception of the clothes, however, does not change the degree to which the individual expects to like the clothes, nor does it change the degree to which the individual actually ‘likes’ the clothes. Hence, the motivational ‘wanting’ peak

¹⁴The feeling of not being the person an individual ideally likes to be might change the degree to which identity-related goods are expected to be liked and therefore wanted. However, these changes in enjoyment and subsequent changes of motivation to consume do not create the urges that induce impulsive behavior.

5.5 *Libertarian paternalism: As judged by whom?*

may explain why individuals sometimes do not ‘want’ their recently bought clothes anymore, only a few hours after the purchase when the self-image discrepancies are not salient anymore and ‘wanting’ is back to the level of ‘liking’.

To sum up, the chapter suggests that by investigating the aspects of reflexive thought that correspond to System 1, rather than to System 2, further insights regarding the motivational foundations of impulsive consumption can be revealed. By combining the motivational aspects of reflexive thought, manifested in self-image motives, with the cue-triggered ‘wanting’ mechanism additional parts of the domain effect in intertemporal choice can be explained. In addition to physiological need deprivation states like hunger, thirst, and drug-addiction, the chapter argues that also psychological need deprivation states related to one’s identity can induce cue-triggered ‘wanting’. Therefore, those goods that have high identity-expressive potential (clothes) tend to be consumed impulsively more often than the goods lacking identity-expressive potential (basic body care or garden tools) (Dittmar and Bond, 2010). Such insights are not possible to obtain by referring to the cognitive aspects of reflexive thought alone.

5.5 **Libertarian paternalism: As judged by whom?**

Behavioral economists have begun to apply their findings to policy issues, endowing these suggestions with the name of libertarian paternalism (Thaler and Sunstein, 2003, 2008).¹⁵ In the US and the UK, libertarian paternalism has already gained considerable political attention. In the UK, for example, the government has created a behavioral insights team, commonly called the nudge unit. Libertarian paternalists suggest policy interventions that change the context (in libertarian paternalistic terms, the choice architecture) in which individuals make decisions. By changing the choice architecture, Thaler and Sunstein (2008) argue, individuals can be nudged to behave in their own best self-interests. Thaler and Sunstein (2008) call a change of the choice architecture libertarian when it maintains individual freedom of choice at the least possible cost. The authors call a policy paternalistic “if it tries to influence choices in a way that makes choosers better off, *as judged by themselves*” (emphasis in the original, p. 5). Hence, to be in line with libertarian paternalism only nudges should be applied that are most likely to help those

¹⁵Other terms include light paternalism (Loewenstein et al., 2008) and asymmetric paternalism (Camerer et al., 2003).

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individuals who want to be nudged and are least likely to inflict harm on those individuals who do not want to be nudged.

In the case of impulsive consumption, one good candidate for a behavior that is not in the best interest of an individual is a behavior that is characterized by a ‘wanting’–‘liking’ dissociation. When an individual strongly ‘wants’ a good but does not ‘like’ the good sufficiently to consume it under normal circumstances, a resulting impulsive consumption act is likely to be against the consumer’s best interest. Accordingly, a policy intervention impacting impulsive behavior can be called libertarian when individuals are still free to choose every good they ‘want’ even if they do not ‘like’ it, and it can be called paternalistic when it tries to reduce ‘wanting’–‘liking’ dissociations.

In the context of this chapter, however, Thaler and Sunstein’s (2008) definition of paternalism, and in particular the emphasis on “*as judged by themselves*”, deserves a closer look because it is not obvious who “themselves” refers to. “Themselves” can be defined on at least two levels, namely either on the level of the decision making system or on the level of the self-image. Regarding the former, Thaler and Sunstein’s (2008) position is quite clear. Nudges can only be used to change intuitive judgment and decision making in System 1, and the deliberative System 2 is not affected by them. It is hence System 2 that judges what is good for the individual in the long run and, accordingly, maintains individual autonomy.¹⁶ Regarding the latter, i.e. the self-image, such a clear-cut position is harder to take on. Currently salient self-images play a role when judging which choices make individuals better off, because they filter the information individuals receive, process, and memorize. However, self-images exist at different levels, dynamically change over time and contexts, and can conflict with each other (Markus and Wurf, 1987).

Consider, for example, two agents who are similar to each other with one exception: The first agent, say *A*, has a predominant self-image of being a scholar and the self-image of the other agent, say *B*, is predominantly that of a wine lover. Whereas *A* does not like his urges to consume wine, *B* obtains some type of (eudaimonic) well-being from following them. As a result, the ‘wanting’–‘liking’ dissociation that characterizes impulsive wine consumption generates a loss in the overall well-being of agent *A* while it does not lead to lower overall well-being of agent *B*. While at the end of the day agent *A* judges a nudge that reduces impulsive wine consumption (for example a mental budget for wine (Thaler, 1999)) as being beneficial, agent *B* does not.

¹⁶There are also views that do not approve of a general privileging of System 2 in self-control problems (see for example Whitman, 2006). However, since ‘wanting’–‘liking’ dissociations can occur in System 1 but typically do not occur in System 2, this chapter supports the position that in self-control problems it is System 2 that can judge what makes the individual better off.

5.6 Nudging ethical consumer behavior

It may even be the case that the nudge reduces agent B 's well-being as it increases the psychological costs related to wine consumption, thus creating a psychic tax that reduces well-being without providing revenues (Glaeser, 2006). From the perspective of a third party, however, agent A and agent B do not differ from each other. Self-images are subjective issues so that it is more difficult for third parties to calculate the costs and benefits of nudges than it is for the individuals themselves. Moreover, while individuals can create nudges according to the cost benefit analysis of their personal situation, nudges by third parties oftentimes can not account for the heterogeneity of consumer preferences (O'Donoghue and Rabin, 2003). The calculation of costs and benefits, however, is an important component in the logic of libertarian paternalism (Thaler and Sunstein, 2003). Accordingly, when self-images differ across individuals, nudges by third parties should be viewed with caution.

This difficulty does not necessarily undermine the usefulness of libertarian paternalism. As a consequence of this difficulty, however, it may be preferable if the choice architect who determines when and how to nudge is the individual herself (or rather her System 2) instead of a third party. If anybody knows which self-image is predominantly salient in an individual, it is the individual herself. Hence, it is easier for individuals to integrate the different frequencies with which various self-images are salient into the cost benefit analysis of nudges than it is for third parties. Individuals are therefore less likely than third parties to make well-being reducing errors when engaging in nudging activities. If both options are available, the chapter therefore suggests that self-imposed nudges should be preferred over nudges by third parties. These third parties, however, may provide mechanisms that individuals can utilize to nudge themselves, if so desired. Additionally, third parties are sometimes in good positions to inform the individuals of potential sources of errors. Such information provision can make use of framing effects or other biases discovered by behavioral economics, as long as individuals are not affected when making choices solely by System 2 (Cordes and Schubert, 2011). Hence, the value of third parties may be in communicating information in specific ways and providing mechanisms that allow individuals to nudge themselves. In what follows, three possibilities are presented how choice architects (third parties but preferably System 2) can nudge individuals' System 1 to make impulsive consumption more ethical.

5.6 Nudging ethical consumer behavior

In the past few decades, ethical considerations have gained increasing importance in consumer behavior (De Pelsmacker et al., 2005; Mazar and Zhong,

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2010). This increased concern has led to a remarkable growth in the market for ethical products. For example in the UK, the amount spent on ethical products rose from £13.5 billion in 1999 to £46.8 billion in 2010 (The Co-operative Bank, 2011) which amounts to approximately 5% of total domestic consumer spending (£918 billion in 2010 according to Clancy (2010)). When opinion polls are used to ask individuals for their willingness to pay substantially more for ethical products, however, these answers suggest that the demand for ethical products should be higher than the approximately 5% (see De Pelsmacker et al., 2005; Vermeir and Verbeke, 2006). Accordingly, positive attitudes towards ethical consumption oftentimes do not translate into ethical consumer behavior, and this is often explained by an attitude-behavior gap (Vermeir and Verbeke, 2006). In this section, the chapter presents some strategies that individuals can use to reduce this attitude-behavior gap so that their positive attitudes towards ethical consumption indeed translate into ethical consumption, more precisely into ethical impulsive consumption.

The chapter adopts a broad definition of ethical consumption and refer to it as consumer behavior where not only personal pleasures and values, as well as factors such as price and quality, but also ideas of what is right and good for other people and the environment influence the motivation to buy (De Pelsmacker et al., 2005; Mazar and Zhong, 2010; Starr, 2009). This definition of ethical consumption contains a positive part, i.e. when ethical products are purchased, and a negative one, i.e. when products that are considered to be unethical are avoided (De Pelsmacker et al., 2005).¹⁷ Analogously to the two definitions of ethical consumption, the chapter distinguishes between two forms of how impulsive ethical consumption can be encouraged. On the one hand, impulsive consumption of ethical products can be induced. On the other hand, impulsive consumption of unethical products can be reduced. The latter form of encouraging impulsive ethical behavior, i.e. reducing unethical impulsive consumption, can happen in two ways. Individuals can either directly try to reduce their desires to consume unethical products, or, when these desires have already occurred, individuals can strengthen their willpower's position in the struggle against the desires for immediate gratification.

Strengthening willpower, i.e. influencing System 2, is the self-control mechanism most often investigated in behavioral economics. In Eq. 5.1 and Eq. 5.2, strengthening willpower refers to an increase of SC_t . To increase SC_t individuals can use external control devices such as soft and hard commit-

¹⁷Starr (2009) lists areas of ethical consumption including buying food produced under environmentally sustainable methods, buying goods procured via fair-trade arrangements, boycotting companies that use sweatshop labor, favoring products with low carbon emissions, recycling diligently, avoiding products with wasteful attributes, buying animal products only from suppliers that use humane husbandry methods, etc.

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ments. While hard commitments have real economic penalties for failure, soft commitments rely on the psychological consequences of not sticking to one's commitments (Bryan et al., 2010). Examples of external devices include saving accounts that restrict withdrawals (Ashraf et al., 2006), Christmas saving clubs, informal bets, and voluntarily putting one's name on a list of people who are banned from gambling in casinos (Thaler and Sunstein, 2008). As a commitment device to reduce one's impulsive wine consumption, one can take only a limited amount of money and no credit card to the restaurant. However, the motivational perspective presented in section 5.4 has more to say about internal control mechanisms than about such external devices.

When internal control mechanisms are used, individuals have to rely more strongly on their willpower than when they use external control devices. For example, to strengthen their System 2 in its struggle against System 1 individuals often engage in cost benefit analyses (Hoch and Loewenstein, 1991). In these analyses, individuals use willpower to make salient the costs of succumbing to the urges.¹⁸ However, since these costs are usually remote and not very tangible (Hoch and Loewenstein, 1991), self-control based on making salient the costs of succumbing is not always easy. Moreover, in line with Glaeser (2006), when governments make salient the costs of succumbing to urges, this may lower the amount of succumbing but also decrease the enjoyment of those individuals who keep on succumbing to the urges. Thus, making salient these costs can be seen as a psychological tax that reduces individual well-being without yielding government revenues (Glaeser, 2006).

The chapter suggests that the knowledge of the cue-triggered 'wanting' mechanism can support the individual's System 2 in its struggle against System 1 by reevaluating the benefits of succumbing to urges. Rather than making salient the costs of succumbing, knowing that impulsive consumption can be characterized by 'wanting'-'liking' dissociations, i.e. that the benefits in terms of 'liking' may be smaller than the strong desires suggest, can reduce the perceived benefits of succumbing to urges. In the case of identity-related impulsive consumption, knowing about possible 'wanting'-'liking' dissociations that can result from self-image discrepancies may induce individuals to reflect on their intentions to buy, for example, some new not necessarily needed clothes produced under bad working conditions. Hence, to reduce impulsive consumption information programs can communicate the (non-intuitive) existence of 'wanting'-'liking' dissociations and provide realistic examples where and when cue-triggered 'wanting' tends to occur. Providing the information

¹⁸These costs of succumbing to urges include economic costs based on an assessment of the ability to pay, and psychic costs such as guilt and regret (Hoch and Loewenstein, 1991). Moreover, identifying the potential health conflicts that temptations pose has been recognized as a critical component of the self-control process (Myrseth and Fishbach, 2009)

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about ‘wanting’–‘liking’ dissociations may have a discernible influence on the behavior of individuals with sufficient reflexive capacity to engage in cost-benefit assessments even in moments where impulses to buy occur.

The second strategy to reduce impulsive consumption is to reduce the frequency with which impulsive urges to consume occur. This strategy influences System 1 rather than System 2. When urges do not occur, willpower is not needed in the first place. Hofmann et al. (2009) argue that a better understanding of the factors underlying temptation helps to discover and apply new ways to change and treat impulse-related disorders. By arranging the architecture for future choices, System 2 can play offense, rather than defense (Baumeister and Tierney, 2011, p. 254) and thus avoid critical situations and struggles between the two systems altogether. Hoch and Loewenstein (1991) suggest three self-control tactics to reduce impulsive urges, namely avoidance, postponement and distraction, and substitution. The knowledge about the cue-triggered ‘wanting’ mechanism helps to elaborate on these tactics. It suggests that individuals can reduce the exposure to specific cues (s_t), change the consumer knowledge (k_t or M_t), and reduce need deprivation states (η_t) in tempting situations.

By reducing the perception or salience of cues (reducing the situations where $s_t = 1$) the occurrence of urges can be prevented. Already children use distraction to avoid perceiving cues that could induce impulsive behavior (Mischel et al., 1989). Individuals can also try to avoid situations in which they are exposed to cues that can interact with visceral states and thus trigger impulsive urges to consume goods they consider to be unethical. To reduce the likelihood of being exposed to such cues individuals can, for example, favor certain shopping environments over others. Individuals who are prone to urges to consume identity-relevant goods (such as clothes) no matter whether these goods are ethically produced can favor shopping environments in which identity-relevant cues are less salient than in other shopping environments. These individuals can, for example, avoid shopping environments where certain role-models such as artificially adjusted “perfect” bodies are particularly salient (Dittmar, 2008).

However, sometimes it is impossible to avoid being exposed to cues that could trigger urges to consume. In the case of urges to consume food items, the checkout aisles in supermarkets are an example for such a situation (Houser et al., 2008). Since cues, however, can trigger ‘wanting’ only when coinciding with consumer knowledge and mesolimbic activation, there are other ways to avoid impulsive urges in such situations. The proximity to candy, for example, is less likely to induce urges to eat unhealthy in satiated individuals compared to hungry individuals (Read and Van Leeuwen, 1998). Therefore, the second strategy to reduce impulsive urges based on the cue-triggered ‘wanting’ mech-

anism that the chapter suggests is to reduce the frequency of decisions made while being in a state of mesolimbic activation ($\eta_t > 0$). System 2 can, for example, reduce the impulses to buy unhealthy food by nudging the individual to eat a little snack before going grocery shopping. Putting a reminder in one's car saying that one should not go grocery shopping when hungry may be a sufficient nudge that System 2 can use to avoid impulses occurring later at the checkout aisles. In the same vein, System 2 can also reduce the amount of impulsively bought clothes whose purchase the individual considers to be unethical for example because the clothes are almost never worn and stay in one's wardrobe most of the time. To do so, System 2 has to make sure that, when purchasing decisions are taken, System 1 is not currently influenced by self-image discrepancies so that in Eq. 5.2 $ISI_t = ASI_t$. Consumers can, for example, bolster their self-images before entering shopping environments where identity-relevant goods such as clothes are present by thinking about positive evaluations they received in the past.

Detecting the situations in which self-image discrepancies are salient, however, is more difficult than realizing that one is hungry and eating a snack before going grocery shopping. When hungry, individuals most of the time explicitly perceive this deprivation state. Self-image discrepancies, on the contrary, are less salient and often operate under the radar of consciousness (Devos and Banaji, 2003). Accordingly, avoiding self-image discrepancies in specific situations is likely to be more difficult than avoiding hunger in specific situations. An alternative way to reduce impulsive desires evoked by self-image discrepancies may thus be needed. A more long-lasting way to reduce impulsive desires evoked by self-image discrepancies is to influence the speed and likelihood with which individuals acquire new ideal self-images.¹⁹ When ideal self-images change rapidly and become unrealistically high, self-image discrepancies are more likely to occur than when ideal self-images are realistic and stable over time. Research by Dittmar (2008) suggests that many individuals adopt their ideal self-images from role models presented in the media. These role models tend to change rapidly and thus destabilize individuals' ideal self-images over time so that it is more likely that self-image discrepancies occur. The undesirable effects of unstable ideal self-images are particularly strong when the newly adopted ideal self-images are unrealistically high. For example, having the "body perfect" and living the "good life" are ideal self-images that are often desired but impossible to achieve (Dittmar, 2008). Also Cordes

¹⁹Such attempts are more lasting because instead of changing specific contextual factors of the decision situations, these attempts interfere in the learning processes of identity-related preferences. As far as preferences are not exogenously given but are subject to change over time, individuals can influence preference learning processes by, for example, influencing which ideal self-images they adopt.

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and Schubert (2011) argue that repeatedly adopting new ideal self-images can lead to undesirable preference learning paths which are characterized by an increasing demand for consumption without an increase in well-being.

To stabilize their ideal self-images at realistic levels, individuals may desire to interfere in the adoption of ideal self-images. Individuals can, for example, try to slow down the process in which they adopt new ideal self-images by reducing their exposure and attention to advertisements. Also, individuals who get richer can try to neutralized the effects that reaching higher income classes have on their ideal self-images by, for example, not joining the local golf club (for a discussion of the effects of changing income on role models and consumer behavior see Cordes, 2009). Policies that help individuals to avoid the adoption of unrealistically high ideal self-images can require advertisers to declare whenever the (role-)models that appear in their advertisements are photoshopped. As an effect of such a declaration, it is likely that individuals stop considering the photoshopped, i.e. unrealistic, models as role models for themselves.

The third strategy to avoid urges to consume that follows from the cue-triggered ‘wanting’ mechanism is to change the consumer knowledge (k_t or M_t). Consumer knowledge relates certain cues to rewards and rewards to visceral states. Just like interfering in the adoption of ideal self-images, changing consumer knowledge is a slower and a more lasting way to influence consumer behavior. Since self-image discrepancies can induce urges to consume goods with symbolic meanings that are congruent with individuals ideal self-images (Sirgy, 1982), individuals can convince themselves that certain products are not congruent with their ideal self-images.

Besides reducing impulsive consumption of unethical products, the second way to encourage ethical impulsive consumption is to nudge impulsive consumption towards ethical products. Instead of trying to reduce their tendency to act impulsively, individuals can work with this tendency and guide their impulsive behavior in ethical directions. The previous section suggested that cue-triggered ‘wanting’ can explain Dittmar and Bond’s (2010) findings that individuals sometimes impulsively consume goods such as clothes that have an identity-relevant symbolic meaning. Clothes, however, are not the only type of identity-relevant products. For individuals who consider themselves to be ethical consumers, ethical products are identity expressive as well. Self-image considerations have been shown to be an important driver of ethical consumption (Benabou and Tirole, 2011; Mazar and Zhong, 2010). Individuals want to maintain sacrosanct beliefs of themselves as being capable, lovable, and moral individuals (Dunning, 2007) and therefore consume ethical products and/or

avoid products they consider as unethical.²⁰

This chapter suggests that moral self-images can also induce impulsive ethical consumer behavior. More precisely, the chapter combines the role played by ethical self-images in inducing ethical consumer behavior with the motivational perspective on impulsive consumption presented in section 5.4. The chapter argues that when individuals' self-images of being ethical individuals are threatened, cue-triggered 'wanting' can lead to impulsive consumption of ethical products. Thus the chapter suggests that ethical consumption is not solely the result of cognitive deliberation in System 2 but that it can also be the result of impulsive urges in System 1. Accordingly, individuals can influence their impulsive behavior and guide it in ethical directions. In order to do this the cue-triggered 'wanting' mechanism suggests that individuals can influence the exposure to cues (s_t), change their consumer knowledge (k_t or M_t), and intentionally evoke need deprivation states (η_t or $f(ISI_t - ASI_t)$). By increasing the exposure to cues associated with ethical products, for example, individuals can try to intentionally trigger urges to consume ethical products. Hence, besides activating associated ethical norms and goals (Mazar and Zhong, 2010), cue-triggered 'wanting' suggests that the mere exposure to environmental cues such as organic labels can trigger strong motivational urges to impulsively consume these ethical goods.

Furthermore, in order to nudge themselves to impulsively consume ethical products individuals can create artificial discrepancies between their ideal self-images of being ethical consumers and their actual self-images so that $ISI_{e,t} > ASI_{e,t}$, where e depicts the salient ethical self-image domain. To do so it might be enough to think about past vices before going shopping. Such thoughts may increase the likelihood of impulsively buying a slightly more expensive but ethical product. Such temptation management,²¹ however, presupposes an

²⁰The connection between self-image motives and ethical behavior has also been made in other economic domains. For example, in their survey about car purchasing behavior, Johansson-Stenman and Martinsson (2006) show that, on average, individuals consider it bad to be concerned about the car's status and good to be concerned about the environment. Brekke et al. (2003) use the individuals' desire to maintain a self-image of being socially responsible to explain that individuals voluntarily contribute to public goods (recycling of household waste and participation in voluntary community work).

²¹Just like some individuals engage in "pleasure-management" (Hoch and Loewenstein, 1991), i.e. voluntarily starve themselves for a while to increase the pleasure derived from subsequent eating, other individuals might engage in "temptation management". Temptation management and pleasure management are closely related. Both types of management involve self-imposed periods of deprivation. However, while in pleasure management this deprivation is used to increase future pleasure, in temptation management deprivation is used to induced specific desires. Thus, pleasure management and temptation management aim at influencing 'liking' and 'wanting', respectively.

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existing ideal self-image of being an ethical consumer. Governmental programs can foster such self-definitions by, for example, supporting famous role-models that appear in the media behaving in environmentally-friendly ways.

However, even when urges to behave in an ethical way occur, it is not yet obvious that these urges manifest themselves in impulsive consumption activities. There have to be products around that the ethical consumers can regard as being expressive of their ethical identities. In other words, consumer knowledge (k_t or M_t) relating the products' symbolic meanings and the individuals' self-images has to exist. Firms, and also the government, can (and actually do) provide information to create this consumer knowledge relating ethical products to ethical self-images (Belk, 1988; Sirgy, 1982). The moral benefits of, for example, organic production should be communicated in credible and realistic ways in order to create the consumer knowledge that such products are indeed expressive of ethical self-images. Governmental programs can support the creation of such consumer knowledge.

To conclude the discussion about practical implications following from the motivational perspective presented in section 5.4, in the following the chapter presents some final remarks regarding the potential scope of nudging impulsive choices to ethical directions. First, ethical behavior induced by self-image motives should be especially visible in relatively affluent societies where other more striving needs (e.g. hunger) are already satiated, and where more individuals tend to have self-images of being ethical consumers. Second, the influence of self-image discrepancies is not restricted to "small" choices. Bigger choices, such as which car to buy, are also influenced by intuitions and urges. Salient and deprived self-images of being environmentally friendly may, for example, induce a desire to buy a small energy-saving car instead of a SUV. In such big decisions, urges are likely to be relatively less important than in small choices. Nevertheless, at the margin such desires might tip the balance towards purchasing a more environmentally friendly car.

5.7 **Concluding remarks**

The aim of libertarian paternalism is to help individuals make better choices, as judged by themselves. To do so it is important to know about the reasons why individuals sometimes deviate from behavior that is in their best interest. Commonly, behavioral economics elaborates on these reasons, among other things, by identifying biases in the decisions made by the intuitive System 1. Also in the context of impulsive consumption, behavioral economics acknowledges that the intuitive System 1 is myopic and strives for immediate gratification. However, with few exceptions, it is not explained why this

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is the case, and the behavioral economic strategy to solve self-control problems relies mostly on the exertion of self-control in System 2. As a result, libertarian paternalistic implications following from this research most often aim at reducing the consequences of given urges by, for example, suggesting commitment strategies that inhibit existing urges from translating into actual behavior. Based on an evolutionary perspective on consumer behavior this chapter elaborates on the motivational foundations of impulsive behavior. It presents the cue-triggered ‘wanting’ mechanism as one potential reason for the occurrence of impulsive urges in System 1. The chapter applies this mechanism to the case of identity-related impulsive consumption in order to explain why and how self-image discrepancies can lead to impulsive consumption of identity-related goods. Based on the knowledge of this mechanism, especially in context of identity-related consumption, the chapter suggests implications for libertarian paternalistic policy interventions. On the one hand, the chapter argues that self-imposed nudges should be preferred to nudges by third parties, because due to the subjective character of self-images, cost benefit analyses of nudges are more difficult for third parties than for the individuals themselves. On the other hand, the chapter suggests nudging strategies how to encourage ethical consumption by either reducing unethical impulsive consumption, or guiding impulsive consumption in ethical directions. The chapter thus shows that an analysis of the motivational foundations of impulsive consumer behavior can complement existing behavioral economic research that aims at generating implications for interventions in the spirit of libertarian paternalism.

6 The impact of differential satiation dynamics on changing consumer behavior, well-being, and innovative activity

6.1 Introduction

Over the last few decades, individuals in most industrial nations have witnessed a strong rise of their disposable income. The individuals exploited their increased financial possibilities and consumption expenditures rose nearly as strong as income did. But not only the amount of consumption rose. Also the structure of consumption expenditures changed (Deaton and Muellbauer, 1980). For example, as indicated by income elasticities below unity, the expenditure shares devoted to food consumption decreased with rising income, so that food is commonly classified as a necessity. This empirical regularity was first shown by Ernst Engel and is so strong that it is referred to as Engel's Law (Engel, 1857). To the contrary, the expenditure shares for categories such as housing and recreation increased with rising income so that the measured income elasticities for these categories are typically above unity and these goods are classified as luxuries. Moreover, since with rising income luxuries can become necessities, income elasticities are not constant and they can vary when income changes (Banks et al., 1997; Blundell et al., 1993). Although there is ample empirical evidence for such structural change on the demand side (Banks et al., 1997; Deaton and Muellbauer, 1980), there are almost no theoretical models that can explain, rather than solely describe, these empirical findings. Taking a need-based perspective, and acknowledging the importance of innovations, this chapter presents a simple formal model that can account for some of the described long-run changes of expenditure shares when income rises.

In comparison to most common economic models that aim at describing the long-term changes on the demand side in a way that is consistent with constrained utility maximization, the model presented in this chapter differs substantially in at least three ways. First, the model follows research suggesting that preferences can, at least partly, be understood on the basis of needs

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instead of assuming that preferences are solely subjective. More precisely, in line with a long tradition in economics (Duesenberry, 1949; Ironmonger, 1972; Scitovsky, 1992; Witt, 2001), the chapter assumes that need deprivation states are the key driver of consumer behavior. Since with rising income, need deprivation/satiation dynamics differ across needs, this need-based perspective is particularly valuable for investigating long-run changes of consumer behavior. The need-based perspective suggests, for example, that expenditure shares for food decrease with rising income because the need for food is easier to be satiated than many other consumer needs such as those for social status, arousal, and positive self-images. Accordingly, these other needs gain importance for consumer behavior over time when income rises (Witt, 2001). Satiation and hence decreasing market shares, however, trigger innovative responses on the supply side. These innovations can change the degree to which different goods are satiable, and hence have to be considered in model explaining structural change on the demand side based on differential satiation dynamics. A second difference to traditional economic models is that the chapter does not a priori assume that individuals rationally maximize their utility or even that rational utility maximization is the best approximation for describing consumer behavior. Instead, the chapter shows that a decision making process inspired by Herrnstein et al.'s (1997) matching law can account for some empirical regularities that most classical utility maximization models have great difficulties to reconstruct. However, the chapter does acknowledge that constrained utility maximization can be used as a normative benchmark with which the consumer behavior that is obtained from the matching model can be compared in a welfare analysis. Third, the chapter departs from the common assumption of utility maximization models stating that choices reveal the individuals' "true" preferences. Since in the model individuals are not rational utility maximizers, it is possible that their motivation to consume (wanting) differs from the well-being (liking) they obtain from consumption. This dissociation of utility into wanting and liking corresponds to recent approaches in neuroscience and behavioral economics (Berridge, 1999; Kahneman, 2003) and is important when analyzing the welfare implications of the decision making process suggested here.

The rest of the chapter is organized as follows. Section 6.2 presents the theoretical background from which the model's assumptions are derived. Section 6.5 presents the model in which differential need satiation patterns translate into long-run changes of consumer behavior when income rises. For two needs, namely the need for nutrition and the need to signal social status, the development of consumer behavior with rising income is shown by means of Engel curves and income elasticities. Section 6.4 compares the income allocation of individuals who match with the income allocation that maximizes individual

utility. In particular, section 6.4 analyzes which individuals in the income distribution suffer more than others from their possibly non-optimal allocation of income when they match and do not maximize. Section 6.5 investigates the impact of an innovation that adds an additional symbolic component to the food product. This innovation affects both structural change on the demand side and the welfare of the consumers. The last section concludes.

6.2 Theoretical background

Neoclassical economists usually explain consumer behavior by assuming that individuals rationally maximize a utility function containing consumer goods under given constraints. The maximization of this function leads to demand functions which can be tested empirically. To identify the utility functions that, when maximized, lead to empirically testable demand functions, economists typically assume that preferences, i.e. the expectations about how much utility consumption acts will provide, are revealed by choices. In other words, utility functions can be derived from observing demand functions. Hence, what economists typically do is to identify demand functions that are good descriptions for observed consumer behavior and, in a second step, identify the utility functions that, when maximized, lead to these demand functions. Utility functions themselves are unobserved. To the contrary, the utility functions, which are maximized to obtain the demand functions, are inferred from the demand functions.

To fit the concept of the *homo oeconomicus*, from a theoretical view all that is needed from these inferred utility functions is that they satisfy certain axioms (such as transitivity, independence, and non-satiation) that make sure that the maximization process works well. Besides these axioms of decision making, traditional economists make no further assumptions, for example about the content, rather than the mathematical structure, of the utility functions. Preferences are assumed to be solely subjective. More than that, inquiring into individual preferences, i.e. understanding the content of individual utility functions, is argued not to be of economists' business (Friedman, 1962; Samuelson, 1937). Accordingly, research in economics has long searched for demand functions that are, on the one hand, the result of the maximization of well-behaved utility functions and, on the other hand, flexible enough to describe various patterns of consumer behavior without needing any information about the content of preferences (Banks et al., 1997; Barnett and Serletis, 2008; Deaton and Muellbauer, 1980).

Consumer behavior can change (more quickly) over situations and (more slowly) over time. In neoclassical economics, changing consumer behavior is

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usually understood as being the result of changes in exogenous variables such as price, income, or, when these aspects are not sufficient, changes in preferences. Partly due to the fact that in economics preferences are usually regarded as solely subjective, however, the discipline has so far failed to provide a unifying model that is able to explain a good deal of changing consumer behavior over time and/or situations. As a result of this failure, certain subfields within economics have emerged that aim at, among other things, understanding more thoroughly individual preferences and the ways preferences change over time and/or situations. While behavioral economics tends to focus on changing preference due to situational factors (Lewis, 2008), this chapter is interested in the relatively slow change of consumer behavior that occurs over time and is less dependent on the context of the decision making situation. This slower change of consumer behavior becomes apparent in the changing allocation of income over time. To the authors knowledge, there is currently no formal model in economics that is based on a theoretical explanation for the fact that over time and with rising income, the expenditure shares devoted to some goods evolve differently than the expenditure shares devoted to other goods.

Empirical evidence for such structural change, however, is ample (Deaton and Muellbauer, 1980). To describe long-run changes of consumer behavior economists usually use Engel curves and income elasticities (Lewbel, 2008). Engel curves describe the relationship between consumption in a particular consumption category, on the one hand, and income, on the other hand. With the Engel curves at hand, one can easily calculate income elasticities. Income elasticities depict the ratio of the percentage change of consumption in a particular consumption category to the percentage change in income. Goods with income elasticities below zero, between zero and unity, and above unity are called inferior goods, necessities, and luxuries respectively. While the expenditure shares devoted to necessities decrease with rising income, the expenditure shares devoted to luxuries increase. Inferior goods are consumed less frequently with rising income. While in almost all empirical studies food turns out to be a necessity, other consumption categories, such as recreation, transport, and housing, usually have income elasticities above unity and are called luxuries (Deaton and Muellbauer, 1980; Kaus, 2012). Moreover, empirical evidence suggests that Engel curves are close to linear in some consumption categories but non-linear in others (Banks et al., 1997). Also, income elasticities can change with income so that a good can be a luxury for poor individuals but a necessity for rich individuals (Lewbel, 2008). For example, Blundell et al. (1993) show that income elasticities for food decrease with rising income from 0.788 for the poorest 5 percent to less than 0.5 for the richest 25 percent.

This chapter argues that the traditional economic strategy to identify utility functions whose maximization leads to empirically testable demand functions was not particularly successful in offering an *explanation* for the described changes of consumer behavior. In particular, such an approach has not offered an explanation why some goods are necessities and other goods are luxuries. At least three reasons for this can be identified: (1) the lack of a motivational foundation of utility functions, (2) the pure focus on constrained utility maximization without acknowledging the possibility of other decision making processes, and (3) the assumed coherence between the motivation to consume and the well-being obtainable from consumption.

The first problem of traditional research in economics on consumer behavior, i.e. the lack of a motivational foundation of economic preferences in favor of the assumption that preferences are solely subjective, makes it difficult to separate one product category from another and to describe the factors that differentiate these categories (Witt, 2001, 2012). The idea of solely subjective preferences is contested by several subdisciplines within economics. For example, socio-economic and behavioral economic approaches argue that individuals are influenced by the social context in predictable ways. Individuals' decisions about how much to spend for status symbols, for example, depend on how much other individuals spend for these goods (Frank, 1985). Other research in behavioral economics investigates predictably changing preferences due to adaptation effects or hedonic treadmills (Frederick and Loewenstein, 1999; Scitovsky, 1992). In the latter approaches, individuals are argued to adapt to the goods they bought so that these goods lose their entertaining value and ever new goods are needed to keep the individuals satisfied. More generally, in psychology there is much research on human motivation. Particularly salient in this literature is the motivation related to individuals' self-images (Gaertner et al., 2008; Gollwitzer and Kirchhof, 1998). Also economists have recently integrated self-images into neoclassical utility functions (Akerlof and Kranton, 2000; Benabou and Tirole, 2011), and Cordes (2009) argues that social self-images, and hence identity-related preferences, can change systematically with rising income.

This chapter follows Witt (2001) who suggests to capture such insights on human motivation in an integrative framework understanding human preferences in terms of basic needs, acquired wants, and cognitively determined motivations. It has long been argued that consumer behavior, just like any other type of behavior, is driven by the desire to satisfy needs (Duesenberry, 1949; Engel, 1857; Ironmonger, 1972; Scitovsky, 1992). By recognizing that human behavior is driven by a finite number of basic human needs, preferences become partly objective and the traditional economic assumption that one cannot say anything about human preferences, because preferences are

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purely subjective, can be softened. To the extent that consumption goods and consumer needs can be related to each other, one can understand the reasons why individuals consume. However, since consumption goods usually have several characteristics and therefore can appeal to different needs at the same time, the need-based approach to preferences can only explain a limited subset of consumer behavior.

Nevertheless, for certain types of consumer behavior the need-based explanation of preferences is valuable. This is especially true when being interested in long-term changes of consumer behavior. Witt (2001) argues that need deprivation states correspond to physiological or psychological discomfort and therefore motivate behavior to reduce the discomfort. Importantly, Witt stresses that the satiation/deprivation patterns across needs differ. With rising income and accordingly more consumption in most categories, the motivation to consume decreases faster for needs that are relatively easy to be satiated than for needs that are relatively difficult to be satiated. Homeostatic needs, such as hunger and thirst, are easier to be satiated with sufficiently high income than other, non-homeostatic needs, such as the need to signal social status, the need for arousal, and the need for positive and consistent self-images. Moreover, besides innate needs which are sometimes easy and sometimes difficult to be satiated, acquired wants and higher order cognitive motives are relatively difficult to be satiated (for a more detailed discussion see Witt, 2001, 2011).

As a result of these differential satiation dynamics, individuals shift their expenditures from the needs that are easy to be satiated to those where the need's motivation has not yet vanished due to high satiation levels. Hence, based on knowledge about differential satiation/deprivation patterns of various needs underlying consumer behavior, it is possible to explain why, with rising income, the allocation of income to various expenditure categories changes. The need-based framework suggests that when very poor individuals gain additional income, they use most of this income to consume basic goods such as food, clothes, or housing. When rich individuals get even richer, they use most of the additional money to consume products corresponding to needs that are relatively difficult to be satiated, such as expensive watches or television sets, bigger cars, or mobile phones.¹

Regarding the second problem of traditional economics, namely the focus

¹Though this approach is somewhat akin, it does not exactly mimic Maslow's (1943) notion of a hierarchy of needs. In the need-based perspective taken here, the satiation of more basic needs is not a necessary condition for behavior that satisfies needs located at higher levels of Maslow's pyramid. To the contrary, in Witt's approach it is possible that even with very low income every expenditure category obtains a (potentially small) fraction of income.

on constrained utility maximization, one has to acknowledge that this way to formalize economic decision making is not problematic per se. The view that individuals rationally maximize their utility under given constraints has been greatly beneficial for explaining a multitude of economic phenomena and lies at the core of the success of economics as a discipline. Constrained utility maximization, however, becomes problematic when it generates predictions that are not consistent with the data, or when great efforts have to be taken to get the predictions consistent with the data. Such problems occur when one uses constrained utility maximization as a tool to explain long-run changes of consumer behavior that are driven by rising income. More specifically, many common utility maximization models predict Engel curves and income elasticities that are not in line with common empirical findings (Deaton and Muellbauer, 1980).

As an example, consider quasi-homothetic preferences such as the Stone-Geary specification of the utility function (Geary, 1950; Stone, 1954). In this specification, consumers obtain utility from consumption in excess of subsistence levels. The maximization of these utility functions leads to Engel curves locally linear in income and income elasticities that tend to unity when income rises. Some even more restrictive specifications of the utility function (for example the Cobb-Douglas utility function and the CES utility function) assume that preferences are homothetic so that Engel curves are straight lines starting in the origin and income elasticities are always, and per definition, unity for all categories at all income levels. This implies that all expenditures are linear in income and that expenditure shares are similar at all income levels. These predictions contradict Engel's law and are clearly proven wrong by many empirical studies (e.g. Blundell et al., 1993).

Other models, such as the AIDS (Deaton and Muellbauer, 1980) and the basic translog (Christensen et al., 1975), assume that expenditures are linear in the logarithm of total expenditure. However, these models still do not have enough flexibility to account for the curvature of Engel curves occurring with large income changes (Barnett and Serletis, 2008), nor do they offer theoretical explanations or predictions for the curvature of Engel curves. The quadratic specification for estimating Engel curves (QUAIDS) suggested by Banks et al. (1997) can account for various types of Engel curves, so that their model can be regarded as the best specified model describing the relationships between individual budget shares and the log of individual incomes. Nevertheless, Banks et al.'s (1997) model involves many parameters which makes it numerically difficult and intractable to implement. Moreover, although Banks et al.'s (1997) model can be used to calculate various types of income elasticities, it is not able to generate predictions about which categories are categorized by which income elasticities and why this is the case (Chai and Moneta, 2010).

Overall, when relatively simple utility functions (Stone-Geary, CES) are used, basic empirical regularities cannot be replicated. When more complicated types of utility functions are used to obtain (more complicated) demand functions (AIDS, basic translog, QUAIDS), these models are flexible enough to capture many empirical regularities, but they also become difficult and intractable to implement. Most importantly, although these models are able to *describe* long-run changes of consumer behavior, they have not been successful in *explaining* why these changes occur and of which type they are.

Research mainly in behavioral economics has shown that in many decision making situations, rational utility maximization is not the best approximation of human behavior (see Camerer, 2004). This chapter argues that utility maximization also leads to unsatisfying predictions regarding long-run changes of consumer behavior. Hence, it may be the case that also for investigating these long-run changes of consumer behavior the assumption of rationality has limited applicability.² It may not be the best strategy to search for particular types of utility functions that can be integrated into the concept of rational utility maximization so that the empirically correct demand systems are “predicted”. There may be better ways to obtain the correct predictions when one departs from the traditional utility maximization framework.

Following Witt (2001), this chapter suggests to use a variant of Herrnstein et al.’s (1997) matching law to formalize consumer behavior when one aims at understanding long-run changes and utilizes the ideas that preferences are based on needs. The matching law has proven to be a good approximation for behavior driven mainly by basic need deprivation states which are related to what Witt (2001) calls innate needs (Herrnstein et al., 1997). The matching law is considered to be one of the most robust experimental findings in behavioral sciences at the level of behavior with little or no cognitive intervention (Davison and McCarthy, 1988). In various studies, mainly with animals but also with humans, where deprived subjects allocate their behavior to obtain a reduction of their deprivation states, a robust finding emerged: Subjects allocate their behavior so that the relative rate of response is proportional to the relative rate of reinforcement. Herrnstein and colleagues call this behavior matching. Formally the matching law can be written as

$$\frac{B_1}{B_1 + B_2} = \frac{R_1}{R_1 + R_2}, \quad (6.1)$$

where B_i depicts the behavior that leads to the reward or reinforcer R_i . R_i can

²As Chakrabarty and Hildenbrand (2011) note, linking the development of expenditure shares to microeconomics was never in the spirit of Engel who was one of the first economists investigating long-run changes of consumer behavior. Nowhere in Engel’s thinking or writings does the concept of an individual demand function appear.

be interpreted as the (motivational) value attached to reward i (Rachlin et al., 1981). In the matching law literature, it is commonly argued that individuals keep track of the average reward that a particular type of behavior generates so that R_i commonly depicts the average reward of need i . Individuals are assumed to shift behavior to those alternatives which provide the highest average reward without considering that their choices change the average rewards obtainable from consumption in the future. Herrnstein and Prelec (1991) call this way of allocating behavior melioration. Melioration leads to matching in the equilibrium. When the average reward R_i does not change as a result of behavior B_i , matching and maximization lead to the same outcome. However, when the reward R_i obtainable from B_i changes as a result of behavior B_i , melioration leads to a different allocation of behavior compared to maximization. Accordingly, when reward is understood in terms of a reduction of a need deprivation state, and consumption choices are distributed over many consumption instances, melioration and matching imply different allocations of behavior. Matching is thus likely to be a good approximation for consumption in categories such as food where the complete expenditure is the sum of many single purchases. For consumption in other categories such as cars where usually just one single and very deliberative purchase is made in a given period, matching and maximization are likely to lead to similar behavior (Herrnstein and Prelec, 1991).

The matching law, however, usually describes behavior in experiments. Outside of experiments, it is difficult to define what R_i stands for (Witt, 2001). To transfer the matching law into the context of human consumer behavior on the population level, and to keep the model as simple as possible, this chapter deviates from the classical literature on the matching law. In the model presented in this chapter, R_i depicts the motivational value of need i corresponding to the need deprivation state that individuals face at the beginning of each period when they have not consumed anything yet. At the beginning of each period, individuals compare these need-deprivation states and then devote their income to the various consumption categories proportional to the deprivation states. Hence this variant of matching suggests that the income to be allocated is divided proportional to the strengths of the need deprivation states in each consumption category. More money is spent in those categories where, at the beginning of the period, deprivation is higher than in those categories where deprivation is relatively low. This way of allocating behavior implies that individuals are not forward looking in the sense that they do not consider which ways of satiation are potentially obtainable and how their consumption changes the pleasure obtainable from future consumption. To the contrary, individuals act solely driven by current states of discomfort caused by deprivation of certain needs.

The third problem that arises when economists aim at explaining Engel curves and income elasticities using constrained maximization models is that no distinction is made between descriptive and normative aspects of utility. The concept of utility subsumes the notions of motivation to consume (wanting) and the well-being obtainable from consumption (liking) in one concept. When individuals are rational, this is not a major problem, because rational individuals want what they like and like what they want. Hence, their behavior reveals their true preferences. However, since behavioral economics and neuroscientific research show that in many situations individuals are not rational, it is not necessarily the case that wanting and liking cohere (Gilbert and Wilson, 2000; Kahneman, 2003). Neuroscientific findings, for example, suggest that wanting and liking correspond to different areas in the brain (Berridge, 1999). In behavioral economics and economic psychology, studies such as Litt et al. (2010) and Dai et al. (2010) show that wanting and liking can also differ when measured behaviorally. As a result, when one departs from the assumption that individuals are rational actors, one cannot use the same utility function to depict motivational aspects of utility and well-being aspects of utility at the same time.

6.3 The model

The model assumes that need deprivation states are the key motivator of consumer behavior. For each consumer need i , the need deprivation state is defined as the difference between the need's satiation point $\theta_{i,t}$ and the satiation level that is present when nothing has been consumed yet. When individuals consume and thereby increase their satiation level up to the satiation point $\theta_{i,t}$, no discomfort of deprivation is present anymore. Each unit of consumption reduces the deprivation state by a need-specific factor depicting the effectiveness of consumption. The chapter will assume this factor to be unity for all needs.³

The motivation to consume in category i at time t is depicted by $v(p_{i,t}c_{i,t})$, where $p_{i,t}$ is the average price of consumption good $c_{i,t}$. The model assumes that this motivation to consume is independent of the consumption in previous periods, i.e. there are no lasting satiation effects from one period to the next period.⁴ Therefore, for each need i at the beginning of every time period where

³The effectiveness of consumption is tied to the means, i.e. consumption goods, by which deprivation can be reduced in the various categories. This effectiveness can be modeled as a function that decreases with consumption in the same category, approaching zero from above so that total satiation will never be reached.

⁴Baucells and Sarin (2007) present a model in which satiation is persistent over time

consumption is still zero ($c_{i,t} = 0$) also the satiation level is zero. Hence, at the beginning of each period, the deprivation state as well as the motivation to consume is completely determined by $\theta_{i,t}$. Note that this also implies that the motivation to consume is independent of the effectiveness of consumption.

The model assumes that at the beginning of each period, individuals allocate their income by comparing the various values of $v(p_{i,t}c_{i,t})$ with each other. More precisely, in every period individuals allocate their income proportional to the motivational strengths of the need deprivation states. That is, individuals match the various motivational values of their consumer needs with the money they spend in the consumption categories. The money spent in category i relative to the overall money spent is matched to the motivational value of need i relative to the sum of all motivational values of all needs. Hence, income is allocated according to

$$\frac{p_{i,t}c_{i,t}}{I_t} = \frac{v(p_{i,t}c_{i,t})}{\sum_{j=1}^n v(p_{j,t}c_{j,t})} = \frac{\theta_{i,t}}{\sum_{j=1}^n \theta_{j,t}}, \quad (6.2)$$

where $I_t = \sum_{j=1}^n p_{j,t}c_{j,t}$. Rearranging equation (6.2) leads to the demand function for good i

$$c_{i,t} = \frac{I_t}{p_{i,t}} \times \frac{\theta_{i,t}}{\sum_{j=1}^n \theta_{j,t}}. \quad (6.3)$$

This decision making process implies that individuals shift their consumption to those alternatives where at the beginning of the period the deprivation is more pressing. To give an example, assume that in an artificial economy only two goods (A and B) exist. Both goods have stable satiation points and average prices are given by $p_A = p_B = 1$. Assume that the motivation to consume good A is 5, and the motivation to consume good B is 3. Matching implies that for any given amount of income below 8, the fraction 5/8 of income is allocated to good A and the fraction 3/8 is allocated to good B . This means that for all levels of income below 8, the percentage of deprivation for both needs is equal. For example, when income is 4, need A obtains 5/2 and need B obtains 3/2 which corresponds in both cases to 50% deprivation. When income increases beyond 8, the motivation to allocate additional income vanishes because an income of 8 is sufficient to satiate both needs. In this case, individuals use their discretionary income that is not needed for need satiation to save for future consumption activities and corner solutions emerge.

In the example above, it is assumed that satiation points are stable. However, for some needs this assumption is not warranted. Following Pollak

and decays at a constant, need-specific rate per period.

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(1970) the model suggests that satiation points are determined by physiological factors (θ_i^{ph}) and by psychological factors ($\theta_{i,t}^{ps}$), so that

$$\theta_{i,t} = \theta_i^{ph} + \theta_{i,t}^{ps}. \quad (6.4)$$

Physiological factors are exogenously given by biology and thus are constant over time. For example in the case of the need for nutrition, the physiological satiation point is arrived when hunger does not motivate eating anymore. Since the amount of income that is needed to achieve this satiation point does not change dramatically over time, needs with a constant satiation point are relatively easy to be satiated with sufficiently high income. Most needs with constant satiation points can be satiated by the products' functional values (instead of the products' possibly existing symbolic meanings). For example in the case of the need for nutrition, the products' calories are the satiating component.⁵

Psychological factors, however, can change the satiation points. Oftentimes these changes are driven by rising individual income or increasing affluence in whole societies. One psychological factor that can change the satiation point and that has received some attention in economics is the social comparison level (Charles et al., 2009; Frank, 1985; Heffetz, 2011; Kaus, 2013; Leibenstein, 1950; Veblen, 1899). Social comparison levels play an important role regarding the human need to signal one's status to others. When one's social comparison group spends a lot for status symbols, individuals who want to signal their status as well have to spend a lot of money, too. Given that one does not want to fall short in a social comparison with one's neighbors, say the Joneses, who have recently bought a new and more expensive car, one has to buy a new and more expensive car as well (Frank, 1985). Individuals choose their social comparison levels partly by themselves, and these choices depend on the individuals' income. Poor individuals tend to have relatively poor peer-groups and richer individuals tend to have richer peer-groups. In line with this argument, Cordes (2009) argues that social self-images change systematically with rising income and material markers of one's social identity become increasingly expensive. Hence, it can be safely assumed that the psychologically satiation point for the need to signal status is a function of one's income.⁶ In the following, the chapter assumes that the psychological

⁵Individuals today, though, spend more for food than hundred years ago. It is, however, likely that this does not hinge on the need for nutrition alone, but additionally on needs for variety, health, status, or ethical considerations. In section 6.5, the chapter will come back to this point.

⁶Another psychological factor that can change the satiation points and has received considerable attention in economics is adaptation. Adaptation plays a role when needs such

satiation point increases linearly with one's income with the factor α_i . Hence, the satiation point can be written as $\theta_{i,t} = \theta_i^{ph} + \alpha_i I_t$.

Including the possibility of changing satiation points, equation (6.3) becomes

$$c_{i,t} = \frac{I_t}{p_{i,t}} \times \frac{\theta_i^{ph} + \alpha_i I_t}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}. \quad (6.5)$$

Given that all prices are unity, the income elasticity for good i is given by⁷

$$\epsilon_{i,t} = 1 + \frac{\alpha_i I_t}{\theta_i^{ph} + \alpha_i I_t} - \frac{\sum_{j=1}^n \alpha_j I_t}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}. \quad (6.6)$$

Equation (6.6) shows that whether a good is a luxury ($\epsilon_{i,t} > 1$) or a necessity ($\epsilon_{i,t} < 1$) depends on the various ratios of $\alpha_i I_t$ and $\theta_i^{ph} + \alpha_i I_t$. $\frac{\alpha_i I_t}{\theta_i^{ph} + \alpha_i I_t}$ depicts the influence of psychological factors on the satiation point of need i , and $\frac{\sum_{j=1}^n \alpha_j I_t}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}$ depicts the influence of all psychological influences combined on the sum of all satiation points. If for need i the influence of psychological factors on the satiation point is higher (lower) than the influence of all psychological influences combined on the sum of all satiation points, need i is a luxury (necessity). Moreover, with rising income, differences across goods in θ_i^{ph} become less important, but differences of the α_i across needs become more important. Hence, to determine whether a good is a luxury or a necessity, with low income it is more important to look at physiological impacts on the satiation point, and with higher income it is more important to look at psychological impacts on the satiation point.

To understand the matching dynamics with unstable satiation points more thoroughly, consider an economy in which only two goods exist that correspond to the only two needs that the consumers in the economy have. The first good depicts all necessities. For illustrative purposes, call this good "food". The need corresponding to food, i.e. the need for nutrition, has a positive and constant physiologically satiation point ($\theta_f^{ph} > 0$) and no psychological

as the need for arousal are considered. Spending the same monthly amount of money does not mean that one gets the same amount of entertainment in each time period. Rather, this year one has to spend more than last year, to reduce the need deprivation down to the same level as yesterday, because individuals adapt and the same television set loses its entertaining value when time goes by. To keep their deprivation state of the need for arousal at a constant level, individuals thus have to consume ever new and more entertaining products (Frederick and Loewenstein, 1999; Scitovsky, 1992).

⁷See Appendix.

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component effects the satiation point ($\alpha_f = 0$). The second good stands for all goods corresponding to needs that are more difficult to be satiated.⁸ This good, say a “status symbol”, has no physiologically satiation point ($\theta_s^{ph} = 0$), but the psychologically satiation point is influenced by social comparisons. To keep it simple, the model again assumes that social comparison levels linearly increase with one’s income so that also the satiation point of the need to signal status linearly increases with income ($\theta_{s,t}^{ps} = \alpha_s I_t$). Hence, $\theta_f = \theta_f^{ph}$ and $\theta_{s,t} = \alpha_s I_t$.

According to equation (6.5) the demand function for food is

$$c_{f,t} = \frac{I_t}{p_{f,t}} \frac{\theta_f^{ph}}{\theta_f^{ph} + \alpha_s I_t}. \quad (6.7)$$

Analogously, the demand function for status symbols is

$$c_{s,t} = \frac{I_t}{p_{s,t}} \frac{\alpha_s I_t}{\theta_f^{ph} + \alpha_s I_t}. \quad (6.8)$$

To see the effects that different dynamics of satiation points have on long term changes of consumer behavior, it is helpful to look at income elasticities of the two goods. The income elasticity for food is $\epsilon_f = 1 - \frac{\alpha_s I_t}{\theta_f^{ph} + \alpha_s I_t}$. Hence, as long as α_s is positive, consistent with empirical findings (Blundell et al., 1993), with very low income the income elasticity for food is close to unity and with rising income, the income elasticity for food decreases. The income elasticity for status symbols is $\epsilon_s = 1 + 1 - \frac{\alpha_s I_t}{\theta_f^{ph} + \alpha_s I_t}$. Hence, as long as α_s is positive, the income elasticity for status symbols is always above unity and decreases with income.

Figure 6.1 graphically illustrates the dynamics of the matching model. For this illustration, it is assumed that the satiation point of the need to eat is 2 so that this need is satiated when $c_{f,t} = \theta_f^{ph} = 2$, and the satiation point of the need to signal social status depends linearly on income and is given by $\theta_{s,t} = (2/3)I_t$. Hence, to reduce the discomfort of having not enough social adoration, individuals have to devote two thirds of their income to status symbols. Both prices are assumed to be unity. Given these specifications, according to equations (6.7) and (6.8), the demand functions when individuals match are $c_{f,t} = \frac{3I_t}{3+I_t}$ and $c_{s,t} = \frac{I_t^2}{3+I_t}$ for food and status symbols, respectively.⁹

⁸It is also possible to think of the two goods as being “food” and “everything else”.

⁹According to equations (6.7) and (6.8), $c_{f,t} = I_t \times \frac{2}{2+(2/3)I_t} = \frac{3I_t}{3+I_t}$, and $c_{s,t} = I_t \times \frac{(2/3)I_t}{2+(2/3)I_t} = \frac{I_t^2}{3+I_t}$

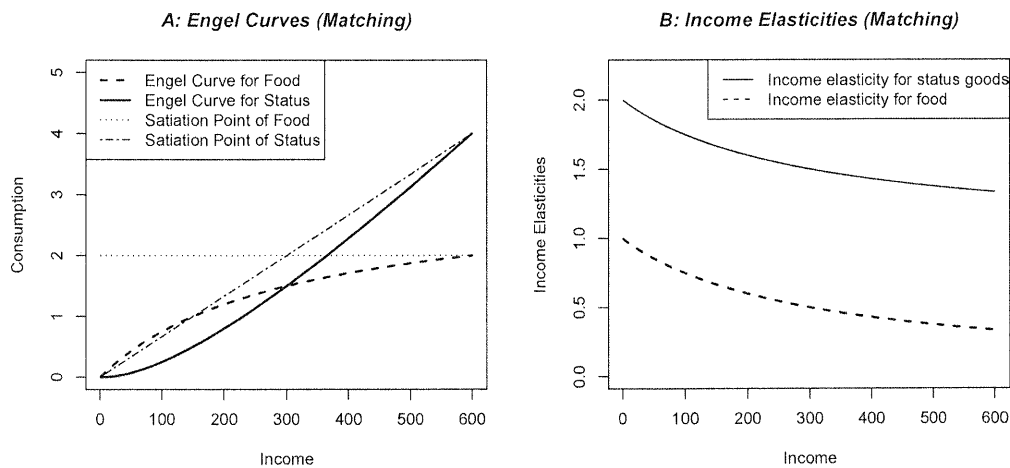


Figure 6.1:

Figure 6.1A depicts the (inverted) Engel curves of the two goods.¹⁰ As illustrated in figure 6.1A, with relatively low income, most income is devoted to food. With rising income, individuals consume more food. However, the increase of food consumption becomes smaller as the satiation level of food approaches its satiation point. Consumption of status symbols is relatively low for poor individuals and increases more than proportionally with rising income. When income reaches 6 units, the individuals are rich enough to satisfy both needs. When income gets above 6, corner solutions are present because the model assumes that individuals do not consume more than it is needed to arrive at their satiation points. Hence, when income is above 6, food consumption stays constant at 2 and consumption of status goods increases with $2/3$ for each unit of increasing income.¹¹

Figure 6.1B shows the income elasticities for food and status goods. It is

¹⁰In all figures, income is depicted in the next smaller money unit so that an income of for example 6 is depicted as 600.

¹¹Corner solutions are always problematic because they can be modified by ad hoc assumptions to fit the model to the observed data. In this case, the chapter assumes that it is unlikely that a situation will occur where indeed all needs are satisfied. The chapter presents a simple two goods/two needs model. However, in reality, much more needs drive consumer behavior. It is likely that some satiation dynamics are related to individual income in more complicated ways than by simple linear relations. Hence, it is not unrealistic to assume that satiation points are never reached. Moreover, a “need to save” can be defined which is insatiable so that satiation is never reached in the model. Another possibility to make sure that the satiation points are never reached is to add the effectiveness of consumption to the model as described in footnote 3.

straightforward to see that in our example the income elasticity for food is $\epsilon_f = 1 - \frac{I_t}{3+I_t}$ and the income elasticity for status symbols is $\epsilon_s = 1 + 1 - \frac{I_t}{3+I_t}$. As can be seen in figure 6.1B, income elasticities for both goods decrease with rising income. This is consistent with empirical findings from, for example, Blundell et al. (1993) who find that income elasticities for food decrease with rising income; a finding that traditional maximization models have difficulties to predict.

6.4 Welfare implications

This section analyzes to what extent consumer behavior following the matching law deviates from consumer behavior that maximizes utility. To compare both types of income allocation, first the section defines a utility function that takes account of satiation points. An additively separable utility function is used which is commonly assumed in textbook economics when the effects of the existence of bliss points are to be understood.¹² Bliss points depict the optimal levels of consumption corresponding to zero (dis-)utility. When consumption is below or beyond these bliss points, utility is negative. Bliss points can be interpreted as satiation points so that minimizing deprivation maximizes utility. In order to be able to compare the utility function with the model presented in section 6.3, again it is assumed that only two goods, food and status goods, exist in the economy. Hence, the utility function with the two bliss points is

$$U(c_{f,t}, c_{s,t}) = -\frac{1}{2}(\theta_f - c_{f,t})^2 - \frac{1}{2}(\theta_{s,t} - c_{s,t})^2. \quad (6.9)$$

As above, the bliss point for food, i.e. θ_f , is defined as 2 and the bliss point for status goods is a function linearly increasing with income ($\theta_{s,t} = (2/3)I_t$). Rational individuals do not consume more than is needed to arrive at their bliss points. In the chapter the consumer behavior following from the maximization of this utility function will be used as the normative benchmark with which the consumer behavior following from the matching law is compared. That is, the chapter assumes that although constrained utility maximization is not a proper means for a descriptive analysis of structural change on the demand side, it is the most tractable normative benchmark available.¹³ Note

¹²Although intuitively appealing, utility functions with bliss points are not often used in neoclassical economics partly because the assumptions of monotonicity and non-satiation do not hold for these functions so that the optimization calculus does not necessarily operate well and corner solutions can emerge.

¹³However, there are also other approaches to normative economics that take account of the fact that preferences can change (see Witt (2005); Witt and Schubert (2010)).

that since rational individuals always want what they like and like what they want, traditionally this utility function is related to both the motivation to consume and the pleasure that can be obtained from consumption.

Maximizing the utility function (6.9) under the constraints $c_{f,t} + c_{s,t} \leq I_t$, $c_{f,t} \geq 0$, and $c_{s,t} \geq 0$ leads to the demand functions $c_{f,t}^{max} = \min(c_{f,t}, 1 + (1/6)I_t)$ and $c_{s,t}^{max} = \max(0, -1 + (5/6)I_t)$ for $I_t < 6$, where corner solutions are present when income is below $6/5$.¹⁴ When income is below $6/5$, individuals spend all their income on food, because even when already some income is devoted to food, a marginal unit of additional food consumption provides more utility than the first marginal unit of status consumption. When income is $6/5$ and all this income is devoted to food, the utility obtainable from one more unit of food equals the utility from the first unit of the status good. Hence, only starting with an income of $6/5$, rational individuals consume status goods. When income is 6 , individuals can reduce their disutility to zero by spending 2 on food and $4 = (2/3)6$ on status symbols. When income increases beyond 6 , individuals do not increase the income allocated to food consumption any further, but still use $(2/3)$ of their additional income to satiate the need to signal social status. Hence, there is another structural break of the Engel curves at $I_t = 6$. For the same reasons as described in section 6.3, however, income is assumed to be below 6 . When income is below $6/5$, the income elasticities for food and status objects are unity and zero, respectively. When income is above $6/5$, the income elasticity for food is $\epsilon_f^* = \frac{I_t}{6+I_t}$ and the income elasticity for status symbols is $\epsilon_s^* = \frac{5I_t}{5I_t-6}$.¹⁵ Both income elasticities tend to unity as income rises. In the case of status consumption this is in line with the data. For food, however, empirical studies suggest that income elasticities decrease with rising income (Blundell et al., 1993).

Figure 6.2 compares the Engel curves that arise from matching with the Engel curves arising from maximization. One can see that both the optimization calculus and the matching approach predict relatively similar curvatures of the Engel curves for rich individuals, given that comparable assumptions about bliss points and satiation points are made. Even if one assumed that individuals match their expenditures, as can be seen in figure 6.2, maximization is a not too bad approximation for the change of consumer behavior of relatively rich individuals who become even richer. For rich individuals, the existence of bliss points or satiation points seems to be more important for the descriptive analysis of long-run changes on the demand side than the question

¹⁴See Appendix.

¹⁵The income elasticities are $\epsilon_{c_{f,t}^{max}} = \frac{\partial c_{f,t}^{max}}{\partial I_t} \frac{I_t}{c_{f,t}^{max}} = \frac{1}{6} \cdot I_t \cdot \frac{6}{6+I_t} = \frac{I_t}{6+I_t}$ and $\epsilon_{c_{s,t}^{max}} = \frac{\partial c_{s,t}^{max}}{\partial I_t} \frac{I_t}{c_{s,t}^{max}} = \frac{5}{6} \cdot I_t \cdot \frac{6}{5I_t-6} = \frac{5I_t}{5I_t-6}$ for food and status, respectively.

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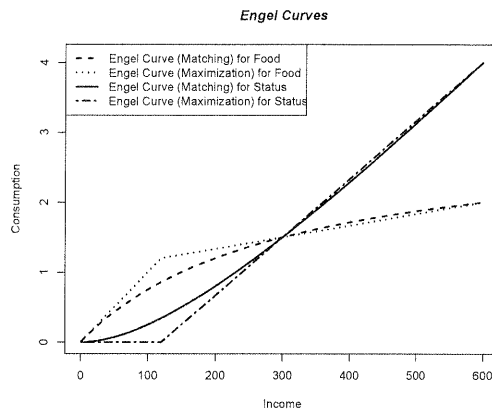


Figure 6.2:

which decision making calculus individuals use.

However, for relatively poor individuals, differences between Engel curves obtained from utility maximization and the matching law are obvious. One obvious difference between both Engel curves is the consumer behavior of individuals who have an income below $6/5$. They maximize their utility by not consuming status goods at all. Matching, however, suggests that these individuals do consume status goods. More generally, relatively poor individuals ($I_t \leq 3$) spend more on status goods and less on food than it is rational, and richer individuals ($3 \leq I_t \leq 6$) spend slightly too much on food and too little on status goods. The deviation from rational behavior, however, is larger for poor individuals than it is for rich individuals.

These differences can play a role in the normative welfare analysis. Assumed that individuals indeed match expenditure shares to need deprivation states, welfare losses can be computed by subtracting the utility corresponding to matching from the utility corresponding to maximization. Figure 6.3A shows the utility that is generated by individuals who either match or maximize to allocate their income. Formally, to obtain figure 6.3A, the various demand functions were inserted into the utility function (6.9). Figure 6.3B plots the welfare reductions from matching compared with maximization for various income levels. As can be seen, the welfare reduction is higher for relatively poor individuals than it is for richer individuals. Individuals with a relatively high income (above 2) have only a very small welfare loss compared to the poorer individuals. Hence, when all individuals follow the matching principle to allocate their income, this behavior leads to a higher welfare loss for the poor than for the rich. This can have consequences for the evaluation of various redistributive policy interventions. Redistribution of income from the

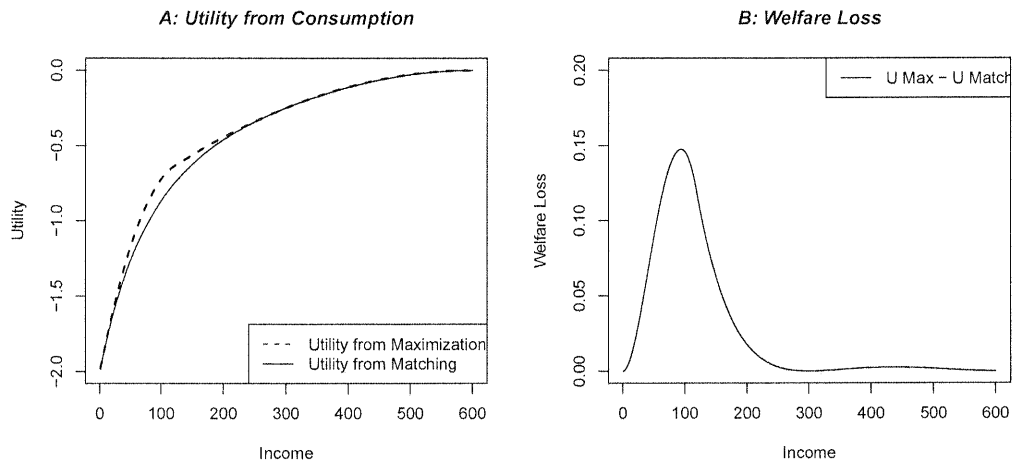


Figure 6.3:

rich to the poor may have a smaller effect in terms of welfare that it has in terms of pure income.

6.5 Innovative activity

The model presented in section 6.3 analyzed differential satiation patterns as one reason for structural change on the demand side when income rises. However, although important, differential satiation is only one of several reasons for such structural change. Another reason is the innovative activity of producers who try to increase the demand for their products (Witt, 2001). One reason for this innovative activity is the reduced demand caused by high satiation levels corresponding to high consumer income. Innovators oftentimes aim at changing the satiation characteristics of consumer goods to generate more consumption. These innovations occur in various forms. For example, Witt suggests that producers sometimes reduce the satiating components of consumer goods, as in the case of diet products, alcohol free beer, and decaffeinated coffee. These innovations reduce the effectiveness of consumer goods to increase satiation levels. Other innovations increase the price of certain products by using rarely occurring and hence more expensive ingredients.

A third type of innovation is to add new characteristics that appeal to less easily satiable needs to the consumer goods. Innovators sometimes add new symbolic characteristics to consumption products, thus providing additional reasons to consume these products. Food items can, for example, be

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used to signal social status and/or communicate with oneself or with others. Moreover, food consumption is oftentimes seen as being driven by self-image motives such as in the case of ethical food consumption. Individuals consume ethical food products to obtain positive and stable self-images of being responsible individuals. These symbolic characteristics can show systematical relationships with rising income as described in section 6.2.

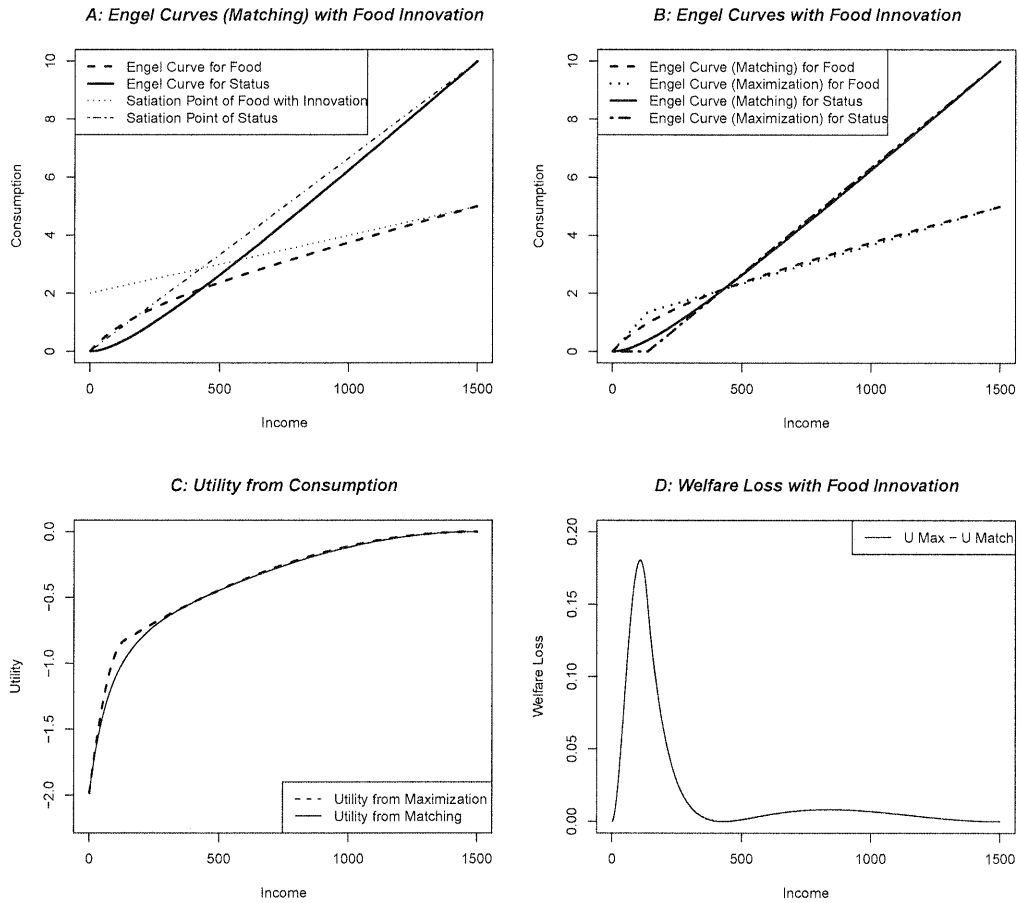


Figure 6.4:

Formally, adding a symbolic meaning to the food item changes the satiation point from θ_f to $\theta_{f,t}^*$. $\theta_{f,t}^*$ now is determined by the physiological satiation point θ_f^{ph} and a psychological factor that changes linearly with income $\theta_{f,t}^{ps} = \alpha_f I_t$, where α_f depicts the degree to which the symbolic motivation to consume the food product varies with income. Hence, the satiation point corresponding to the two needs that food items can satiate after the innovation is given by

$\theta_{f,t}^* = \theta_f^{ph} + \alpha_f I_t$. Accordingly, when individuals match, i.e. according to equation (6.3), the demand function for food is $c_{f,t}^* = \frac{\theta_f^{ph} I_t + \alpha_f I_t^2}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t}$ and the demand function for status goods is $c_{s,t}^* = \frac{\alpha_s I_t^2}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t}$. Figure 6.4A shows these demand functions as well as how the satiation points for food and the status good change with rising income. Figure 6.4B compares the matching Engel curves with the Engel curves obtained when equation (6.9) is maximized with $\theta_f = \theta_f^{ph} + \alpha_f I_t$ and $\theta_s = \alpha_s I_t$ under the constraints $c_{f,t} + c_{s,t} \leq I_t$, $c_{f,t} \geq 0$, and $c_{s,t} \geq 0$ (see Appendix). Figure 6.4C shows the utility obtained from both ways of allocating income to the two consumption categories, and figure 6.4D plots the welfare loss generated by matching instead of maximization. Comparing figure 6.3B with figure 6.4D shows that the innovation increased the welfare loss of relatively poor individuals so that their behavior deviates more strongly from the rational benchmark.

6.6 Concluding remarks

This chapter presents a simple matching model in which differential need satiation dynamics across needs translate into long-run changes of consumer behavior. The model is able to reconstruct some empirical regularities that traditional maximization models have difficulties to generate. For example, the empiric regularity that income elasticities for food decrease with rising income is difficult to be generated in most maximization models, but the matching model can reconstruct this regularity. Furthermore, the chapter compares the allocation of income generated by the matching model with the allocation of income generated by a utility maximization calculus. Both decision making processes generate relatively similar Engel curves for rich individuals. For poor individuals, however, the two types of Engel curves are quite different. When relatively poor individuals match, they spend more than it is optimal on luxury products such as status goods and less than it is optimal on necessities such as food. The deviations from optimal behavior when individuals match are thus larger for poor individuals than they are for rich individuals. Accordingly, the model suggests that the inequality in a society measured in terms of well-being can be higher than the inequality measured in terms of income. This has implications for the evaluation of redistributive policy interventions, and future research can investigate the effects of such interventions. Moreover, the chapter shows that an innovation that adds a symbolic component to a basic good can increase the welfare loss of poor individuals that emerges when individuals match instead of maximizing. Future research can investigate the effects that other types of innovations

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have on structural change and individual well-being. Finally, since matching and maximization lead to particularly different allocations of income for poor individuals, future empirical research can investigate which decision making process leads to Engel curves that are better approximations of the behavior of poor individuals.

6.7 Mathematical Appendix

Calculation of income elasticities in section 6.3:

The demand functions are given by $c_{i,t} = \frac{I_t \theta_i^{ph} + \alpha_i I_t^2}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}$. Hence,

$$\begin{aligned} \epsilon_{i,t} &= \frac{\partial c_{i,t}}{\partial I_t} \frac{I_t}{c_{i,t}} \\ &= \frac{[(\theta_j^{ph} + 2\alpha_j I_t)(\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)) - (I_t \theta_j^{ph} + \alpha_j I_t^2) \sum_{j=1}^n \alpha_j] \cdot I_t \cdot \sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}{(\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t))^2 \cdot (I_t \theta_j^{ph} + \alpha_j I_t^2)} \\ &= \frac{(\theta_j^{ph} + 2\alpha_j I_t)(\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)) - (I_t \theta_i^{ph} + \alpha_i I_t^2) \sum_{j=1}^n \alpha_j}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t) \cdot (\theta_i^{ph} + \alpha_i I_t)} \\ &= \frac{\theta_i^{ph} + 2\alpha_i I_t}{\theta_i^{ph} + \alpha_i I_t} - \frac{I_t \sum_{j=1}^n \alpha_j}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)} \\ &= 1 + \frac{\alpha_i I_t}{\theta_i^{ph} + \alpha_i I_t} - \frac{\sum_{j=1}^n \alpha_j I_t}{\sum_{j=1}^n (\theta_j^{ph} + \alpha_j I_t)}. \end{aligned}$$

Maximization calculus in section 6.4:

Maximizing the utility function

$$U(c_{f,t}, c_{s,t}) = -\frac{1}{2}(2 - c_{f,t})^2 - \frac{1}{2}((2/3)I_t - c_{s,t})^2 \quad (6.10)$$

under the constraints $c_{f,t} + c_{s,t} \leq I_t$, $c_{f,t} \geq 0$, and $c_{s,t} \geq 0$ using the Lagrange method

$$L = -\frac{1}{2}(2 - c_{f,t})^2 - \frac{1}{2}((2/3)I_t - c_{s,t})^2 + \lambda[I_t - c_{f,t} + c_{s,t}] \quad (6.11)$$

leads to the first order conditions

$$\frac{\partial L}{\partial c_{f,t}} = 0 \Leftrightarrow 2 - c_{f,t}^{max} = \lambda \quad (6.12)$$

and

$$\frac{\partial L}{\partial c_{s,t}} = 0 \Leftrightarrow (2/3)I_t - c_{s,t}^{max} = \lambda. \quad (6.13)$$

Hence, $2 - c_{f,t}^{max} = (2/3)I_t - c_{s,t}^{max}$ and with $c_{f,t}^{max} + c_{s,t}^{max} = I_t$, $c_{f,t}^{max} = 2 - (2/3)I_t + I_t - c_{f,t}^{max}$ so that $c_{f,t}^{max} = 1 + (1/6)I_t$. However, since $c_{f,t} + c_{s,t} \leq I_t$, the solution is

$$c_{f,t}^{max} = \min(c_{f,t}^{max}, 1 + (1/6)I_t). \quad (6.14)$$

Since, $c_{s,t} = I_t - c_{f,t}$, $c_{s,t}^{max} = I_t - 1 - (1/6)I_t$ so that $c_{s,t}^{max} = -1 + (5/6)I_t$. Due to $c_{s,t} \geq 0$, the solution is

$$c_{s,t}^{max} = \max(0, -1 + (5/6)I_t). \quad (6.15)$$

Matching and maximization with innovation in section 6.5:

The demand functions when individuals match after the innovation for food and status are $c_f^* = I_t \cdot \frac{\theta_f^{ph} + \alpha_f I_t}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t} = \frac{\theta_f^{ph} I_t + \alpha_f I_t^2}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t}$ and $c_s^* = I_t \cdot \frac{\alpha_s I_t}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t} = \frac{\alpha_s I_t^2}{\theta_f^{ph} + \alpha_f I_t + \alpha_s I_t}$. With $\theta_f^{ph} = 2$, $\alpha_s = (2/3)$, and $\alpha_f = (1/5)$: $c_f^* = \frac{2I_t + (1/5)I_t^2}{2 + (1/5)I_t + (2/3)I_t} = \frac{2I_t + (1/5)I_t^2}{2 + (13/15)I_t}$ and $c_s^* = \frac{(2/3)I_t^2}{2 + (1/5)I_t + (2/3)I_t} = \frac{I_t^2}{3 + (13/10)I_t}$.

Maximizing the utility function

$$U(c_f^*, c_s^*) = -\frac{1}{2}(\theta_f^{ph} + \alpha_f I_t - c_f^*)^2 - \frac{1}{2}(\alpha_s I_t - c_s^*)^2 \quad (6.16)$$

under the constraints $c_f^* \geq 0$, $c_s^* \geq 0$, and $c_f^* + c_s^* \leq I_t$ using the Lagrange method leads to the first order conditions

$$\theta_f^{ph} + \alpha_f I_t - c_f^{max,*} = \lambda \quad (6.17)$$

and

$$\alpha_s I_t - c_s^{max,*} = \lambda, \quad (6.18)$$

so that with $c_f^* + c_s^* = I_t$,

$$c_f^{max,*} = \frac{1}{2}(\theta_f^{ph} + (1 + \alpha_f - \alpha_s)I_t) \quad (6.19)$$

and

$$c_s^{max,*} = -\frac{1}{2}\theta_f^{ph} + \frac{1}{2}(1 - \alpha_f + \alpha_s)I_t. \quad (6.20)$$

7 Conclusion

As noted in the introduction, this dissertation pursues three aims. The first, quite general aim is to contribute to the growth of interdisciplinary knowledge, as well as to suggest and provoke new ways of interdisciplinary research on the edge of economics and psychology. The second aim is to show that the need-based explanation of preferences suggested by Witt (2001) can support behavioral economics and influence the recent developments within behavioral economics.¹ The third aim of this dissertation is to show that for some economically relevant questions, the need-based explanation of preferences has better answers than behavioral economics and neoclassical economics have.

In chapter 2, the ability of the need-based approach to explain changing preferences is compared with the abilities of neoclassical economics and behavioral economics to explain (different forms of) changing preferences. In the chapter, I distinguish between two types of changing preferences. On the one hand, preferences can change quickly when the context in which decisions are made changes (context-dependent preferences). On the other hand, preferences can change mainly independent of situational factors in a slower and more lasting way (shifting preferences).

I argue that while neoclassical economics is not well-suited to explain any of the two types of preference change, behavioral economics is able to explain a good deal of context-dependent preference change. However, since behavioral economics focuses on decision making processes and is not interested in the content of these decisions, it cannot go beyond explaining the influence of situational factors on preferences, and it is silent about how preferences themselves change in the long run potentially independent of situational factors. Using the premise that different needs are characterized by differential satiation patterns, the need-based approach can explain such shifting preferences over the long run. Hence, I argue that the need-based approach is a better choice than neoclassical or behavioral economic approaches when one is interested in long-run changes of consumer behavior.

In chapter 2, I moreover argue that the need-based explanation of prefer-

¹These recent developments include (1) the rise of neuroeconomics and the related belief that human behavior is well-approximated by dual-process models, (2) the increasing role of affect in economic decision making, and (3) the engagement of behavioral economists in welfare economics and the presentation of policy implications (Angner and Loewenstein, 2012).

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ences and the behavioral economic focus on judgment and decision making can benefit from each other. Behavioral economics, for example, is likely to benefit from a motivational perspective that helps to understand why the deviations from rational benchmarks are stronger in some domains than in others, and in which domains these deviations are likely to become bigger over time. Moreover, contextual factors can also influence the slower preference formation process, because individuals infer their preferences from their own past behavior (Bem, 1967) so that situational factors can have an influence on the slower type of preference shifting (Ariely and Norton, 2008). I argue that future research should put more emphasis on motivational aspects of human behavior to complement the already well-established decision-theoretic research conducted in behavioral economics.

With the major aim of increasing the economists' familiarity with the concept of the self-image, chapter 3 presents an overview about the usually psychological topic of the self-image. In this overview, the chapter highlights the motivational aspects of self-images, i.e. self-image motives or identity-related needs, thus fitting well into the dissertation's general need-based perspective. The chapter is meant to inspire future research by economists using one or another idea or concept related to self-images.

Chapters 4 and 5 apply the need-based approach to the fields of intertemporal choice and impulsive consumption. In chapter 4, a need-based mechanism called cue-triggered 'wanting' is presented. Cue-triggered 'wanting' is one explanation for the urges that potentially lead to impulsive consumption. The cue-triggered 'wanting' mechanism originated from neuroscientific work by Kent Berridge and colleagues who suggest that reward can be dissociated into 'wanting' and 'liking' components (Berridge, 1999; Berridge and Aldridge, 2008). Cue-triggered 'wanting' can lead to impulsive choices where immediately obtainable rewards are strongly 'wanted', although the same rewards are neither expected to be liked nor 'liked' when they are actually consumed. Hence, the chapter is closely related to recent developments within behavioral economics that make use of neuroscientific insights to better understand economic phenomena. On a neurological level, the chapter deals with the motivational foundations of impulsive behavior. More formally, chapter 4 integrates the cue-triggered 'wanting' mechanism into an otherwise standard intertemporal choice model and thus generates the incentive salience model of intertemporal choice.

The incentive salience model of intertemporal choice is also in line with recent behavioral economic developments that argue that human decision making is well-described by dual process theories. The model distinguishes between an impulsive decision making System 1 and a reflective decision making System 2 and focuses on the impulsive System 1. More precisely, the

model assumes that the impulsivity in System 1 can be explained using the cue-triggered ‘wanting’ mechanism so that in impulsive choices rewards are sometimes stronger ‘wanted’ than ‘liked’. Cue-triggered ‘wanting’ can occur when need deprived individuals perceive cues that are associated with rewards known to satisfy currently deprived needs. If not controlled by cognitive efforts, cue-triggered ‘wanting’ can induce impulsive choices of smaller sooner rewards instead of larger later rewards, although the latter are ‘liked’ more.

Chapter 4 suggests that via the cue-triggered ‘wanting’ mechanism, need deprivation states can lead to impulsive consumption. Hence, the need-based perspective on impulsive consumption can support behavioral economics in generating scientific progress in the field of intertemporal choice. The need-based perspective suggests to observe need deprivation states, consumer knowledge, cues, and (lack of) self-control and to use these observations to experimentally test predictions regarding impulsivity made by the incentive salience model. Besides this predictive capacity, the incentive salience model offers possible explanations for present-biased preferences, the magnitude effect, and the domain effect. The model is thus one example of how a need-based explanation of preferences combined with neuroscientific insights can complement behavioral economic research.

Chapter 5 is closely related to chapter 4 and presents some policy implications in the spirit of libertarian paternalism (Thaler and Sunstein, 2008). To come up with these normative implications, the chapter first engages in a descriptive analysis of impulsive consumption. More particularly, chapter 5 works out the roles that cognitive and motivational aspects of reflexive thought (self-control and self-image motives, respectively) play in intertemporal decisions. While self-control (in System 2) inhibits individuals from consuming impulsively, self-image motives can induce impulsive consumption in System 1. Recent behavioral economic research on impulsive consumption tends to focus on the mitigating effects of self-control (Dewitte, 2012; Hofmann et al., 2009) and mainly neglects the motivational question where urges to consume come from. To explain where some of these urges come from, chapter 5 combines the cue-triggered ‘wanting’ mechanism (introduced in chapter 4) with self-image motives (introduced in chapter 3). Chapter 5 argues that the cue-triggered ‘wanting’ mechanism can explain recent findings by Dittmar and Bond (2010) who show that self-image discrepancies can induce impulsive consumption of identity-related goods.

Utilizing this explanation of identity-relevant impulsive consumption, chapter 5 presents implications for libertarian paternalistic policy interventions that aim at influencing impulsive consumption. On the one hand, the chapter argues that self-nudges should be preferred to nudges by third parties, because the subjective character of self-images makes it difficult for third parties

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to judge what makes individuals better off. On the other hand, partly by highlighting the motivational aspects of impulsive consumption and reflexive thought, three libertarian paternalistic strategies emerge. These are presented in the context of ethical consumption. First, individual willpower to guard against unethical impulsive consumption can be strengthened. Second, the desires for unethical impulsive consumption can be reduced. Third, impulsive consumption can be guided to ethical directions by making salient certain self-images that favor ethical consumption.

The latter two libertarian paternalistic strategies emerge directly from the need-based motivational perspective taken in this dissertation and are not possible when sticking to the decision-theoretic focus of behavioral economics. Moreover, a research focus on the motivational foundations underlying consumer behavior is likely to lead to libertarian paternalistic strategies that affect consumer behavior in a more lasting way than libertarian paternalistic strategies that emerge from decision-theoretic research. Hence, for future research I suggest to put more emphasis on such long-lasting libertarian paternalistic interventions that deal with the motivations underlying consumer behavior.

Other future work on the incentive salience model in normatively relevant areas can investigate more thoroughly the normative impact that considering impulsive consumption as being characterized by ‘wanting’–‘liking’ dissociations has. These implications can be major, and the ideas presented in chapters 4 and 5 may change the way economists conceive of individual welfare at least in the context of impulsive consumption. Understanding impulsive choices as being characterized by ‘wanting’–‘liking’ dissociations raises serious doubt on the applicability of the welfare criterion economists traditionally use. This traditional welfare criterion claims that since individuals rationally choose what is best for them, maximizing freedom of choice also maximizes welfare. To the extent that ‘wanting’ and ‘liking’ do not cohere, however, one cannot infer preferences, and thus welfare, from choices and it is not true anymore that maximizing the freedom of choice automatically maximizes welfare. What individuals reveal by their choices is ‘wanting’, not ‘liking’.

In a related vein, Witt and Schubert (2010) argue that the concept of revealed preferences does not consider the causes for certain actions. The need-based perspective adapted from Witt (2001), to the contrary, takes into account these causes. When the cause of an action to consume is cue-triggered ‘wanting’ (> ‘liking’), one cannot automatically infer a higher level of well-being resulting from the choice. Hence, integrating the mechanism of cue-triggered ‘wanting’ leads to a different account of the welfare that can be obtained from impulsive consumption. It can be argued that impulsive consumption should be weighted less than other types of consumption in the welfare

calculus, and that the reduction of the moral weight of impulsive consumption should reflect the ‘wanting’–‘liking’ dissociation. This view challenges the argument that higher moral weight should be put on basic needs relative to acquired wants and cognitively learned motives to consume (Witt and Schubert, 2010). When exactly these basic needs also induce cue-triggered ‘wanting’ characterized by ‘wanting’–‘liking’ dissociations, this higher moral weight can be doubted. Hence, impulsive consumption might be an exception to the normative, rule-like proposition that higher moral weight should be put on the satisfaction of basic needs. To be sure, such normative considerations arise only when a need-based motivational perspective is taken. Hence, the need-based perspective can support the recently developing normative branch of behavioral economics.

A second welfare implication becomes obvious when one considers that preference learning can have implications for individual well-being. Preference learning is at the core of the evolutionary economic perspective on welfare economics (Schubert, 2012). Individuals sometimes infer their preferences from their own behavior or from impulsively activated schemata even when these preferences or schemata were determined by situational factors (Ariely and Norton, 2008; Bem, 1967). Cue-triggered ‘wanting’ is one way to understand such influence of situational factors on preference learning. Since individuals sometimes enjoy preference learning (Schubert, 2012), and preference learning is hindered when individuals exclusively consume those products that they already expect to like, cue-triggered ‘wanting’ may increase individual well-being. Individuals, for example, sometimes enjoy going grocery shopping when they are very hungry. The decisions which products to buy are thereby handed off to their impulsive urges occurring in System 1. Hence, although impulsive consumption may be weighted less in the welfare calculus using utility measured at one single point in time, it may ultimately increase well-being when also preference learning is considered.

In chapter 6, I presented a simple matching model in which differential need satiation dynamics across needs translate into long-run changes of consumer behavior. The model is a formalization of Witt’s (2001) need-based framework that verbally explains the long-run changes of consumer behavior over the recent decades. Over these decades, the fraction of income devoted to necessities such as food has decreased, and the fraction of income devoted to luxuries such as status goods and recreational activities has increased (Deaton and Muellbauer, 1980). However, in economics there are almost no theoretical models that can explain, rather than solely describe, these empirical findings.

The model presented in chapter 6 follows Witt (2001) in arguing that different needs are characterized by different satiation dynamics. The model shows that those needs that are relatively easy to be satiated (for example the need

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to eat) loose expenditure shares when income rises, and those needs that are relatively difficult to be satiated (such as those for social status, entertainment, and positive self-images) gain in expenditure shares when income rises. The model uses a variant of Herrnstein et al.'s (1997) matching law as the decision making process according to which individuals allocate their income. As a result of the usage of this decision making process, the model is able to reconstruct the empiric regularity that income elasticities for food decline with rising income (Blundell et al., 1993). Most traditional utility maximization models have difficulties to reconstruct this finding.

Moreover, the chapter compares the allocation of income from matching individuals with the allocation of income that is optimal, i.e. that is the result of constrained utility maximization. Chapter 6 shows that for relatively rich individuals, matching and maximization generate quite similar allocations of income. However, for poor individuals there are larger differences: When poor individuals match, they spend more than it is optimal on luxury products such as status goods and less than it is optimal on necessities such as food. The deviations from optimal behavior when individuals match are thus larger for poor individuals than they are for rich individuals. Accordingly, the model suggests that the inequality in a society measured in terms of well-being can be higher than the inequality measured in terms of income. This can have implications for the evaluation of redistributive policy interventions, and future research can investigate the degree to which this can (and should) be the case.

As innovations play an important role in influencing satiation patterns, the chapter also investigates the effect that one particular type of innovation has on Engel curves and individual well-being. This innovation adds an additional symbolic component to the food product. Due to this symbolic component, also food can now be used to signal social status so that another motivation to consume food is added. The chapter shows that at any given income level, this innovation increases the consumption of food and decreases the consumption of other status symbols. Moreover, it is shown that the welfare loss, especially for the poor, is higher in the economy with the innovation than it is in the economy without the innovation. Hence, chapter 6 argues that innovations should not be seen as solely beneficial. Future research can investigate the effects that other types of innovations have on structural change and individual well-being.

Since matching and maximization lead to particularly different allocations of income for poor individuals, future empirical research can investigate which decision making process leads to Engel curves that are better approximations of the behavior of poor individuals. Moreover, the model suggests that for those consumption categories where clear statements about the satiation dy-

namics can be given, parametric testing should be preferred to non-parametric, i.e. theory-free, testing.

Chapter 6 analyzes long-run changes of consumer behavior in a way that is distinct from the analyses in neoclassical economics and behavioral economics. The chapter integrates insights from biology and motivational psychology about the satiation dynamics of various needs. Moreover, the chapter uses a decision making mechanism inspired from research in behavioral psychology to formalize individual consumer behavior. The chapter thus shows that using insights from these disciplines can answer questions that are beyond the questions asked in neoclassical economics and behavioral economics. This holds particularly true when one is interested in the long-run changes of consumer behavior. Thus, chapter 6 can be seen as a step towards more interdisciplinary research on the edge of economics and (not only cognitive) psychology.

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Leonhard K. Lades

