

Bianca A.C. Groen

# ENABLING EMPLOYEES



through co-development  
of performance measures

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Bianca Anna Clazina Groen

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Everyone is a genius.

But if you judge a fish on its ability to climb a tree,  
it will live its whole life believing that it is stupid.

*Albert Einstein*



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# PREFACE

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# PREFACE

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Bianca A.C. Groen



It was at the end of 2007 and I had just finished my master thesis in industrial and organizational psychology. Although I had another master thesis waiting for me, I thought it was time to dive into the “real” world called “practice”. Hence I began searching for a job in which I hoped to increase my knowledge of managerial practice. At the time, I was convinced this was the best option in order to begin a PhD in the area of “management” in a topic which would be applicable to organizations.

Simultaneously, Marc Wouters, Ewout van Jarwaarde and I received the publication acceptance letter of a paper we wrote based on our study tour of Thailand and Vietnam. Shortly after, we had a dinner to celebrate the paper’s publication and Marc inquired as to our plans for the future. After I told him my plans, Marc described a PhD project he hoped to begin within a beverage manufacturing company. He was looking for a PhD candidate who was eager to work in practice while simultaneously participating in edifying research to eventually obtain a PhD. I am still grateful to Ewout for broaching the topic of potential candidates as I was unaware Marc was thinking of me when he described his plans.

Immediately, Marc’s offer appeared to be a great opportunity to incorporate my educational and practical goals in one task. This project would allow me to merge two streams of my past education: industrial and organizational psychology and industrial engineering and management. And at the same time it would allow me to gain practical experience while obtaining my PhD.

The company’s head of the supply department soon agreed to begin the project as he felt an immediate need to improve the performance of employees of the bottling department. I was to lead several new projects to co-develop performance measures with employees and their managers. He speculated improvements could be made by increasing employees’ enthusiasm and ambition and by supporting this process with factual information of the current performance. He had positive earlier experiences with co-developing performance measures with employees, as several MSc graduate students had previously performed similar projects in other areas of the supply department. Marc Wouters and Celeste Wilderom had coached most of these students during their projects. They were both convinced I could help improve the company’s performance through this new project and agreed to coach me in this.

I began my research in March 2008 on a project within the maintenance department of the bottling lines. I developed performance measures with the employees and researched how this affected their behavior and their performance. In the one and a half years I spent at the company, I met many wonderful people who supported me through this project. I cannot

name everyone, but I feel the urge to name and thank at least the people who were most important in this process. Andries de Groen, I want to thank you for your trust in me and in our approach. Without you, the project would never have started in the first place. Tinka Stertefeld has been involved in numerous projects in the past and I was fortunate to have the experience to learn from her expertise. Thank you Tinka, for listening to me every once in a while and for sharing your experience.

Other important people were the maintenance technicians with whom I developed the performance measures. I loved working with you. I have experienced how knowledgeable you all are and I appreciated your creative ideas for improving the bottling department. I know not all of you were initially looking forward to the project. Nevertheless, you delivered important input to eventually develop useful performance measures. I was pleased to see that as the project developed, many of you began to realize how useful performance measures can actually be.

Hans Abbink and Gerald Zweers, as supervisors of the maintenance technicians you were the ones who had to reconcile the needs of both the higher management and the maintenance technicians. During my action-research period I experienced how difficult that can be. Thank you so much for all your help in the project!

Finally, I would like to thank all the other people with whom I had very interesting conversations during my stay at the company, including the other employees of the maintenance department who gave me a lot of support, the members of the supply team who provided me with useful feedback, and the employees of the central warehouse who really made me feel welcome in their office. Of these central warehouse colleagues I wish to give some special thanks to Ronnie Bomers. Ronnie, I still remember our first meeting: you were very excited about the performance measures you made in one of the earlier co-development projects with Marc and Celeste. You convinced me how beneficial co-developing performance measures can be to employees and organizations. And later on, whenever I needed help with anything, you were always there to help me. Thank you so much for everything. I hope we keep in touch!

Even with the support of all these people, my time at the company was the most demanding part of my PhD. Around the start of my research, the company was taken over by a large multi-national organization. This take-over led to a massive reorganization within the company which influenced the priorities of the organization and its employees. These new circumstances led to the joint decision of the company and the researchers to pause any new projects. Fortunately, my promoters and our department chair Nico Mol were convinced I would still be able to significantly

contribute to the scientific output of our department. Consequently, I had the opportunity to continue my research, but then solely at the university. Nico, Marc and Celeste, I cannot thank you enough for making this possible!

For the next period, I used a survey to study the same research question: Why do employees perform better if they are involved in developing the performance measures used to measure their performance? In terms of research contributions, this was useful because the strengths of the survey method eliminate the weaknesses of the action-research method and vice versa. For me personally it was useful because it allowed me to get back into my comfort zone and to regain my self-confidence and passion for research. As with every research project, not everything went as expected—for example, it took much more effort to collect data than we had anticipated—however, this was nothing compared to what I had experienced in my action-research period. I really enjoyed this period: I remember many days on which I almost could not resist posting on Facebook how much I loved my work.

The joy in my work was in a large part due to the pleasant people I worked with. I would like to recognize my colleagues of the former Finance and Accounting department and of the newly formed Business Administration department. Thank you for being such good company especially during the many lunches we had.

The single most important persons on my way to finishing this dissertation were my promoters: Marc Wouters and Celeste Wilderom. I hope these few words will do justice to how much I enjoyed working with you. I am grateful for all your help, not only in writing this dissertation, but also for creating opportunities which would help me further in my career. Thank you both for your trust in me. Marc, with your openness to ideas and feedback you are the ideal sparring partner. I admire your eagerness to continue learning. You have been such a great example! Celeste, I will never forget how much you helped me in the emotionally difficult times I experienced, especially in the beginning of my PhD project. Moreover, I really appreciated that you were always ready to give me feedback. To my surprise, even when I sent something in the weekend, I could count on having received large amounts of useful comments and editing when I started working on Monday morning. Thank you for all your support! Marc and Celeste, I honestly hope there will be many more opportunities to cooperate in the future!

I would also like to name a few of the other people who have helped me along the way. First of all, the three department heads I have had in the four years I worked here: Nico Mol, Hans de Groot en Aard Groen. Nico,

Hans and Aard, thank you for your confidence in me and for recognizing my efforts! I could never forget our secretaries: Jolande Hennink, Manon Jannink and Hèla Klaczynski. Thank you for always being there for me!

Many others, along with my promoters, have helped me in the writing process as well, by reviewing my papers and/or by giving comments during the many presentations I have given. I would like to thank the following persons for their helpful comments on earlier versions of the various parts of this dissertation: Sally Widener; Sander van Triest; Matthew Hall; Nóra Szűcs; Peter van den Berg, Jadzia Siemienski-Kleyn; Arnold Ross; Jeff Hicks; Paul Bakker; Erin Karman; Martijn Groen; the reviewers and session participants at the 5th and 6th Conference on Performance Measurement and Management Control, American Accounting Association 2010 and 2012 Management Accounting Section Meeting, 33th and 35th European Accounting Association Annual Congress, European Academy of Management Annual Conference 2011 and 2012, Academy of Management Annual Meeting 2011 and 2012, EAWOP 2011 conference, University of Hong Kong, Erasmus University Rotterdam, University of Groningen, University of Amsterdam, Eindhoven University of Technology and University of Twente. Moreover, I want to thank the members of my committee for their enthusiasm for being part of the committee and for their time and effort in reading my dissertation.

This research could never have been done without everyone who participated as research subjects. I want to thank every participant, as well as those who helped find them, including the following organizations: EVO, NGI Platform voor ICT-professionals, Noventum Service Management Consultants, TSM2Connect and Vereniging Logistiek Management.

Obviously, my PhD period was not only about working. I had another passion as well: playing handball. I spent many hours a week with my friends of Cabezota, the handball club of the university. Thank you for the wonderful years!! While my handball career has ended, I look forward to the many years as friends.

Besides my Cabezota-friends, I have many other friends who—unfortunately—I have not seen much lately. I am happy to see you all at my defense. I hope you know that even though we don't speak as often as we used to, I will always be there for you whenever you need me.

And last but not least, I would like to thank my family and my boyfriend. Mum, dad and little bros: thanks for always being there for me, no matter what. I am happy to have such a lovely and warm home to turn back to every once in a while. And Gerrit, I am so glad I got to know you! Thank you for all the wonderful moments we shared. I hope there are many more to come!



# SAMEN- VATTING

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## Verbetering van medewerkers- prestaties door samen prestatie- indicatoren te ontwikkelen

A new version of this paper is soon to be published as:

Groen, B.A.C. (2012). Betere prestaties door samen prestatie-indicatoren te ontwikkelen. *Maandblad voor Accountancy en Bedrijfseconomie*.



# SAMEN- VATTING

---

Bianca A.C. Groen

## **SAMENVATTING**

Uit onderzoek is gebleken dat medewerkersprestaties kunnen verbeteren door samen met medewerkers prestatie-indicatoren te ontwikkelen. Onbekend is hoe deze verbetering precies tot stand komt, terwijl organisaties dat juist moeten weten als zij hetzelfde willen bereiken. Dit proefschrift test twee mogelijke verklaringen. Uit drie verschillende studies blijkt dat zowel medewerkers als leidinggevenden de kwaliteit van samen ontwikkelde prestatie-indicatoren hoger vinden. Verder blijkt dat kwalitatief goede prestatie-indicatoren medewerkers beter in staat stellen om goed te presteren en ze helpen leidinggevenden om discussies aan te gaan met medewerkers over hun prestaties. Dit zorgt allebei voor betere prestaties van medewerkers.

## **RELEVANTIE VOOR DE PRAKTIJK**

Dit onderzoek geeft organisaties inzicht in hoe medewerkersprestaties kunnen verbeteren door medewerkers te betrekken bij het ontwikkelen van prestatie-indicatoren. Daarnaast bevat dit proefschrift een omschrijving van hoe zo'n ontwikkelingstraject kan worden vormgegeven.



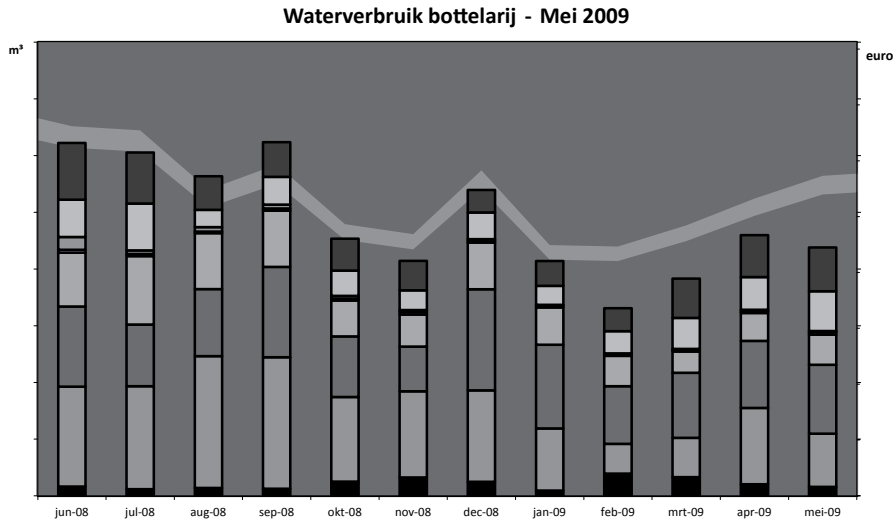
# Hoofdstuk 1

Verschillende onderzoeken hebben aangetoond dat medewerkersprestaties verbeterd kunnen worden door samen met medewerkers prestatie-indicatoren te ontwikkelen (Abernethy & Bouwens, 2005; Hunton & Gibson, 1999; Kleingeld, Van Tuijl, & Algera, 2004). Deze onderzoeken gaan ervan uit dat medewerkersprestaties worden verhoogd doordat samen prestatie-indicatoren ontwikkelen een positieve invloed heeft op het gedrag van medewerkers. Er is echter nog geen empirisch onderzoek gedaan naar deze mogelijke verklaring, terwijl dat wel heel belangrijk is om dezelfde positieve effecten te kunnen krijgen in andere organisaties. In het huidige onderzoek staat daarom de volgende vraag centraal: *Waarom gaan medewerkers beter presteren als ze worden betrokken bij het maken van de prestatie-indicatoren die worden gebruikt om hun prestaties te meten?* In dit onderzoek worden twee modellen getest ter verklaring van de relatie tussen samen prestatie-indicatoren maken en medewerkersprestaties.

## 1.1 Wat zijn prestatie-indicatoren?

Om goed te begrijpen waar dit proefschrift over gaat, is het belangrijk om te weten wat hier wordt bedoeld met prestatie-indicatoren. In de basis komt het hier op neer: prestatie-indicatoren zijn alles wat gebruikt wordt om de werkprestaties van medewerkers kwantitatief mee uit te drukken. In dit onderzoek wordt alleen gekeken naar prestatie-indicatoren van uitvoerende medewerkers in het primaire proces van de organisatie. Voorbeelden van zulke medewerkers zijn: advocaten, artsen, bouwvakkers, callcentermedewerkers, chauffeurs, consultants, docenten, ICT'ers, logistiek medewerkers, monteurs, operators, technici, verkopers, verplegers, etc. Een specifiekere definitie van een prestatie-indicator is: een meetinstrument dat gebruikt wordt om de effectiviteit of efficiëntie van acties te kwantificeren (Neely, Gregory, & Platts, 1995). Figuur 1 geeft een voorbeeld van een prestatie-indicator die de hoeveelheid waterverbruik van de bottelarij meet.

Met “het samen ontwikkelen van prestatie-indicatoren” wordt bedoeld dat medewerkers een substantiële hoeveelheid invloed krijgen in het ontwerp, de implementatie en de doorontwikkeling van de prestatie-indicatoren die gebruikt worden om hun prestaties te meten. Het gaat hierbij dus niet alleen om het stellen van doelen, maar ook om het ontwerp van alle andere onderdelen van de prestatie-indicatoren: de formule, de databronnen, de naam, de koppeling aan een hoger doel, en de afspraken over hoe vaak er gemeten wordt en wie waarvoor verantwoordelijk is (zie Neely, Bourne, Mills, Platts, & Richards, 2002; Neely, Richards, Mills, Platts, & Bourne, 1997).



**Figuur 1** Voorbeeld van een prestatie-indicator

## 1.2 Opbouw van het proefschrift

Dit proefschrift beschrijft drie verschillende studies die een antwoord geven op de vraag waarom medewerkers beter gaan presteren als ze worden betrokken bij het maken van hun eigen prestatie-indicatoren. Hoofdstuk 2 gaat over een onderzoek in een middelgroot productiebedrijf. In dat bedrijf heb ik samen met de monteurs van de bottelarij prestatie-indicatoren ontwikkeld. Op basis van deze ervaringen heb ik een verklaring kunnen vinden voor de relatie tussen samen prestatie-indicatoren ontwikkelen en medewerkersprestaties. Bovendien heeft dit actie-onderzoek geleid tot een stappenplan dat andere organisaties kan helpen om zelf ook zinvolle prestatie-indicatoren te ontwikkelen samen met medewerkers.

Het verklarende model dat het initiële actie-onderzoek heeft opgeleverd is verder onderzocht met een vragenlijstonderzoek onder paren van medewerkers en leidinggevenden in allerlei verschillende soorten banen, organisaties en sectoren. Dit onderzoek wordt beschreven in Hoofdstuk 3 en geeft inzicht in de positieve gevolgen voor medewerkers van het samen ontwikkelen van prestatie-indicatoren die uiteindelijk leiden tot betere prestaties. Hoofdstuk 4 is ook gebaseerd op hetzelfde vragenlijstonderzoek, maar beantwoordt de centrale vraag vanuit een heel ander perspectief. Hierin wordt gekeken naar hoe *leidinggevenden* omgaan met samen met medewerkers ontwikkelde prestatie-indicatoren en hoe dat weer leidt tot betere prestaties van medewerkers. De laatste paragraaf vat de bevindingen van de drie studies samen.

## Hoofdstuk 2

De eerste studie naar een verklaring voor het verband tussen samen prestatie-indicatoren ontwikkelen en medewerkersprestaties vond plaats in een middelgroot productiebedrijf. Het hoofd van de afdeling “supply” wilde graag dat de monteurs van de bottelarij meer initiatieven voor verbetering van de bottelarij zouden gaan nemen en dat ze daarmee de prestaties van de bottelarij zouden verhogen. Op basis van eerdere projecten binnen de organisatie (zie bijvoorbeeld Wouters & Wilderom, 2008) was hij ervan overtuigd dat dit mogelijk was door samen met die monteurs prestatie-indicatoren te ontwikkelen. Als projectleider van dit project kreeg ik hiermee de unieke kans om in de praktijk te onderzoeken hoe het komt dat medewerkers meer verbeterinitiatieven gaan nemen als ze worden betrokken bij het maken van hun eigen prestatie-indicatoren en hoe prestaties als gevolg hiervan verbeteren.

Voor het beantwoorden van deze vraag leek de *theory of planned behavior* relevant (Ajzen, 1991; door Fishbein and Ajzen, 2010 en Ajzen, 2012 ook wel het *reasoned action model* genoemd). Deze theorie wordt veel gebruikt om allerlei soorten menselijk gedrag te verklaren, voorspellen en veranderen. Volgens de theorie zijn er drie factoren van invloed op iemands gedrag: iemands houding ten opzichte van het gedrag (*attitude*), de sociale druk die iemand voelt om het gedrag uit te voeren (*norm*) en de mate waarin iemand het gevoel heeft het gedrag uit te kunnen voeren (*control*). In dit onderzoek was het specifieke gedrag “meer verbeterinitiatieven nemen” en er is gekeken in hoeverre deze drie factoren positief beïnvloed werden door samen met medewerkers prestaties te ontwikkelen.

### 2.1 Methode

Dit onderzoek maakte gebruik van actie-onderzoek, omdat het daarmee mogelijk is om gedetailleerd en praktisch relevant inzicht te verkrijgen in het proces dat uiteindelijk heeft geleid tot een verbetering (Coughlan & Coughlan, 2002; Kasanen, Lukka, & Siitonen, 1993). De specifieke vorm van actie-onderzoek die we gebruikten heet *clinical field work* (Baskerville & Wood-Harper, 1998). Dat houdt in dat de onderzoeker de organisatie helpt een bepaald probleem op te lossen (Schein, 1987). In dit geval was het “probleem” volgens het afdelingshoofd dat de monteurs te weinig verbeterinitiatieven vertoonden. Dit probleem werd aangepakt door prestatie-indicatoren te ontwikkelen samen met alle 34 monteurs. Tijdens dit proces werd op basis van interviews, observaties en vragenlijsten bekeken hoe dit ontwikkelproces leidde tot veranderingen in *attitude*, *norm* en *control* van de monteurs en uiteindelijk tot meer verbeterinitiatieven.

Verder werd op basis van archiefdata gekeken of het samen ontwikkelen van prestatie-indicatoren ook echt leidde tot verbeteringen in de afdelingsprestaties.

## 2.2 Het ontwikkelproces

In deze paragraaf wordt de ontwikkeling van de prestatie-indicatoren samen met de medewerkers beschreven. Dit is niet alleen een belangrijk onderdeel van de methode, maar ook een resultaat op zich. Andere organisaties kunnen deze omschrijving gebruiken om ook hun medewerkers te betrekken bij de ontwikkeling van prestatie-indicatoren.

Belangrijk voor het ontwikkelproces was dat er vanaf het begin een onafhankelijke projectleider was aangesteld (Wouters, 2009). Tijdens de ontwikkelingsbijeenkomsten met medewerkers nam deze projectleider een gebalanceerde rol in. Aan de ene kant trad zij op als coach om zo de medewerkers voldoende de ruimte te geven om hun eigen ideeën in de prestatie-indicatoren tot uitdrukking te laten komen. En tegelijkertijd was zij de expert die ideeën aandroeg om op die manier te laten zien wat er allemaal mogelijk was.

Voor het project van start ging, zijn de doelen van het project bepaald: het project moest leiden tot meer verbeterinitiatieven van monteurs en tot prestatieverbetering van de bottelarij. Verder was van te voren bepaald in welke richtingen prestatie-indicatoren moesten worden gemaakt, zodat de indicatoren aan zouden sluiten bij de doelen van de organisatie. Daartoe waren vier verschillende themagroepen gemaakt: energieverbruik, materiaalverlies, storingen en planmatig onderhoud.

Het eerste contact met de monteurs over dit project was een nieuwsbrief vlak voor de zomervakantie. Daarin kregen ze alvast een voorproefje van het project. Daarnaast was er in te lezen dat de projectleider voorafgaand aan het project met iedere monteur een persoonlijk gesprek zou hebben waarin het project verder zou worden uitgelegd.

Na de persoonlijke gesprekken waren er bijeenkomsten met iedere themagroep. In de eerste bijeenkomst van elke groep werden met behulp van een "brainwrite"<sup>1</sup> zoveel mogelijk verbeterideeën bedacht. Het was belangrijk om met verbeterideeën te beginnen, want dat is veel concreter dan prestatie-indicatoren en het laat gelijk zien dat de prestatie-indicatoren gekoppeld moeten zijn aan aspecten die je wilt verbeteren.

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<sup>1</sup>In een brainwrite krijgt iedereen een formulier met daarop een concrete verbetervraag. In tien minuten schrijft iedereen zoveel mogelijk verbeterideeën op. Daarna geven ze hun formulier door aan degene naast hen. Zo krijgt men weer tien minuten om de ideeën door te lezen en nieuwe ideeën aan te dragen. Dit gaat zo door totdat iedereen zijn eigen formulier weer voor zich heeft.

Voor de tweede bijeenkomst van de themagroepen had de projectleider de verbeterideeën gecategoriseerd en besproken met de leidinggevenden van de monteurs. In de tweede bijeenkomst bespraken de monteurs de verbeterideeën en gaven ze aan welke drie categorieën het meest relevant waren om prestatie-indicatoren voor te maken.

In de volgende sessies werden de prestatie-indicatoren zelf ontwikkeld. Aan de hand van de criteria van Neely et al. (2002) werd besloten hoe de indicatoren moesten gaan heten, aan welke doelen van de organisatie ze gerelateerd zijn, welke data gebruikt worden en hoe die worden weergegeven, welk target de monteurs wilden halen, hoe vaak de indicatoren geüpdatet en besproken worden en wie er verantwoordelijk is voor het updaten. Uiteindelijk waren de volgende prestatie-indicatoren gemaakt: (1) uitstoot door ondervulling, (2) legeflessenuitstoot, (3) waterverbruik, (4) persluchtverbruik en (5) electriciteitsverbruik.

Tussen de sessies in creëerde de projectleider steeds prototypes gebaseerd op bestaande data uit de informatiesystemen van de organisatie, waarin al deze ideeën verwerkt waren. Met zo'n prototype konden monteurs zien hoe de door hen ontworpen prestatie-indicatoren eruit kwamen te zien en of ze al helemaal aan de behoeften voldeden. De prototypes werden ook direct gebruikt alsof ze al af waren: ze werden elke maand besproken tijdens een van de bijeenkomsten van de monteurs met hun leidinggevenden die iedere ochtend plaatsvinden. Zo was het mogelijk om elke keer een concrete discussie te houden over wat er nog beter kon.

### 2.3 Bevindingen

Op het moment dat de monteurs hoorden dat ze binnenkort prestatie-indicatoren zouden moeten gaan maken, reageerden ze erg negatief: "dat is toch helemaal niet mogelijk voor zo'n ingewikkeld proces", was de eerste reactie die ik hoorde van een monteur. En de tweede reactie, van een andere monteur, was: "ik vind het helemaal niet nodig om beoordeeld te worden". Na afloop van het ontwikkelproces waren ze veel positiever. Ze begrepen toen hoe nuttig prestatie-indicatoren voor ze konden zijn. Voorbeelden van reacties tijdens de evaluatiesessies waren: "van te voren had ik geen idee wat een KPI was, nu weet ik dat beter" en "je ziet nu ongeveer waar je mee bezig bent qua cijfers en geld".

De ontwikkeling van prestatie-indicatoren samen met de monteurs van de bottelarij had verschillende positieve gevolgen. Allereerst zagen we dat de monteurs meer initiatieven namen om de prestaties van de bottelarij te verbeteren. Dit was ook direct terug te zien in de scores op de gemaakte prestatie-indicatoren die op basis van de data in de meetsystemen van

de organisatie konden worden gereconstrueerd voor de periode voordat de prestatie-indicatoren waren ontwikkeld. Direct de maand nadat de prestatie-indicatoren in gebruik werden genomen gingen de prestaties op die indicatoren omhoog.

Op basis van gesprekken met de monteurs en hun leidinggevenden vonden we hier verschillende verklaringen voor, die overeenkomen met wat volgens de *theory of planned behavior* belangrijk is om gedrag van mensen te beïnvloeden: ze kregen een positievere houding ten opzichte van verbeterinitiatieven nemen (*attitude*), ze voelden meer sociale druk om verbeterinitiatieven te nemen (*norm*), en de nieuw ontwikkelde prestatie-indicatoren stelden medewerkers beter in staat om hun werk goed te doen (*control*). Een vragenlijstonderzoek onder de monteurs liet zien dat deze drie variabelen inderdaad gerelateerd zijn aan verbetergedrag ( $r_{attitude-verbetergedrag}=0,58, p<0,01; r_{norm-verbetergedrag}=0,43, p<0,05; r_{control-verbetergedrag}=0,38, p<0,05$ ).

De monteurs gaven aan dat ze—nu er gebruik werd gemaakt van prestatiemeting—eindelijk erkenning kregen voor het werk dat ze verrichtten. Al hun inspanningen werden direct zichtbaar in de prestatie-indicatoren en dit was op zich al heel motiverend, maar dit effect werd nog eens versterkt doordat de leidinggevenden van de monteurs dit gebruikten om de monteurs te complimenteren met hun goede werk. Deze erkenning van hun inspanningen zorgde ervoor dat de monteurs een positievere houding kregen ten opzichte van verbeterinitiatieven nemen. Opvallend was dat de motivatie van monteurs om te verbeteren vooral omhoog ging toen de prestatie-indicatoren ook inzichtelijk maakten hoeveel geld er bespaard kon worden.

Een tweede positief gevolg van het samen ontwikkelen van prestatie-indicatoren was dat de monteurs meer sociale druk voelden om verbeterinitiatieven te nemen. De prestatie-indicatoren maakten het mogelijk om concrete doelen te stellen en daardoor beter te weten wat er van elkaar verwacht werd. Toen de monteurs bijvoorbeeld zagen dat ze op een bepaalde productielijn een hogere uitstoot door ondervulling hadden dan op andere vergelijkbare lijnen, deden ze er alles aan om die lijn op hetzelfde niveau te krijgen.

Verder stelden de nieuw ontwikkelde prestatie-indicatoren medewerkers op allerlei manieren beter in staat om hun werk goed te doen. De indicatoren gaven bijvoorbeeld inzicht in waar de meeste verbetering mogelijk was, waardoor monteurs beter prioriteiten konden stellen en waardoor ze ook meer ondersteuning kregen van hun leidinggevenden om die verbeteringen door te voeren (met name in de zin van geld en tijd). Daarnaast vormden de prestatie-indicatoren elke maand een onderwerp

van discussie, waardoor de monteurs en hun leidinggevendenden meer informatie uitwisselden. Dit zorgde er allemaal voor dat de monteurs ook echt de mogelijkheid hadden om verbeterinitiatieven te ontplooiën. Overigens was er één indicator gemaakt waarvan de monteurs niet geloofden dat zij invloed hadden op de score. En ze slaagden er inderdaad niet in de score op die indicator te verbeteren. Hieruit blijkt dat *control* essentieel is om meer verbeterinitiatieven te nemen. Dit correspondeert met de resultaten op de vragenlijst die de monteurs hebben ingevuld. Uit een regressieanalyse bleek dat als alle variabelen tegelijkertijd worden meegenomen in de analyse alleen *control* significant gerelateerd was aan medewerkersinitiatief ( $\beta=0,38, p<0,05$ ).

Een laatste positief uitvloeisel van samen met de monteurs prestatie-indicatoren ontwikkelen, was dat de kwaliteit van die prestatie-indicatoren veel beter was en bleef dan wanneer de monteurs geen invloed zouden hebben gehad. De monteurs bleken bijvoorbeeld veel verstand te hebben van welke gegevensbronnen het meest relevant zouden zijn. Bovendien zagen de monteurs het—toen de prestatie-indicatoren in gebruik waren—onmiddellijk als er iets mis was met de meters waarop de prestatie-indicatoren gebaseerd waren. Omdat ze geloofden in het nut van een goede meting, namen ze bij een defecte meter nu direct actie.

## 2.4 Discussie

Samengevat liet dit actie-onderzoek zien dat de *theory of planned behavior* kan verklaren waarom medewerkers meer verbeterinitiatieven gaan ontplooiën als ze zijn betrokken bij het maken van hun eigen prestatie-indicatoren. Samen prestatie-indicatoren maken blijkt ervoor te zorgen dat medewerkers een positievere houding hebben ten aanzien van het nemen van verbeterinitiatieven, dat ze meer sociale druk voelen om verbeterinitiatieven te nemen en dat ze zich ook beter in staat voelen om meer initiatieven tot verbetering te nemen. Deze combinatie van factoren leidt ertoe dat medewerkers ook echt meer verbeterinitiatieven gaan nemen en daardoor beter scoren op de prestatie-indicatoren.

Sterk aan deze studie is dat het een diepgaand inzicht geeft in hoe prestatie-indicatoren ontwikkelen samen met medewerkers in de praktijk uitwerkt. Beperkingen zijn dat de resultaten gebaseerd zijn op slechts één afdeling binnen één bedrijf en dat het onmogelijk was om de participatieve manier van prestatie-indicatoren maken te vergelijken met een top-down manier. In antwoord op deze beperkingen is in Hoofdstuk 3 gebruik gemaakt van een groot cross-sectioneel vragenlijstonderzoek onder een veel bredere groep respondenten.

## Hoofdstuk 3

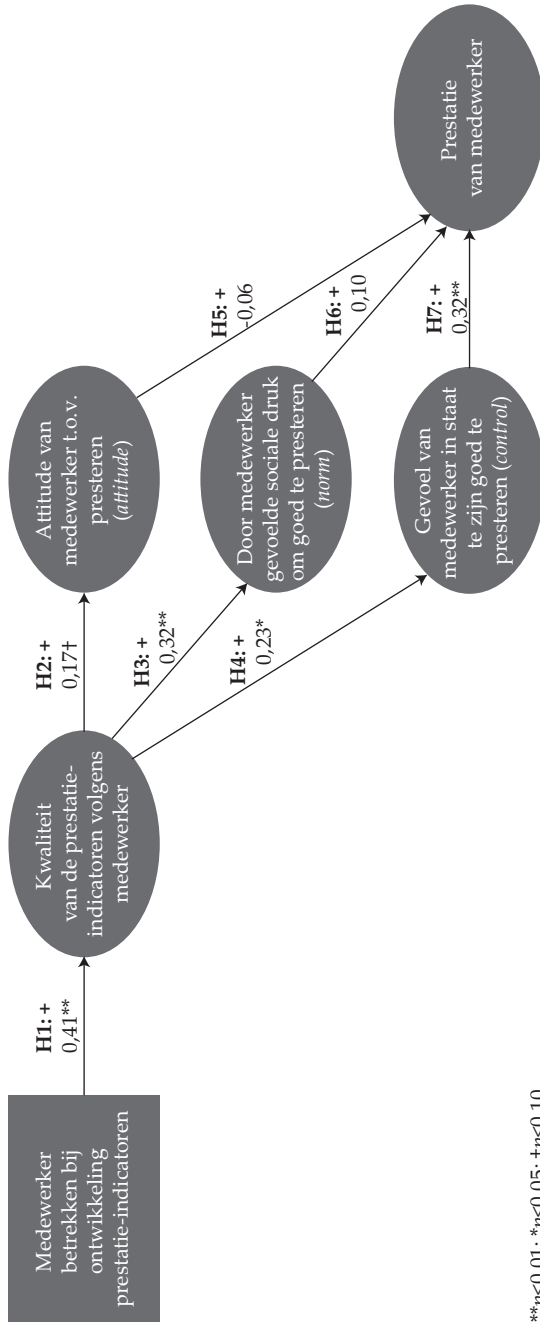
Het actie-onderzoek in combinatie met verdere literatuur heeft geleid tot een model dat vanuit het perspectief van de medewerker verklaart waarom medewerkersprestaties kunnen worden verbeterd als zij worden betrokken bij het maken van hun eigen prestatie-indicatoren. Een schematische weergave van dit model is te vinden in Figuur 2. Het model bestaat uit zeven hypothesen. Allereerst wordt verwacht dat medewerkers de kwaliteit van prestatie-indicatoren beter vinden als zij betrokken zijn bij het maken van prestatie-indicatoren (Hypothese 1). Dit komt enerzijds doordat medewerkers waardevolle unieke informatie bezitten over hun werk die alleen opgenomen kan worden in de prestatie-indicatoren als zij betrokken zijn bij de ontwikkeling ervan en anderzijds zullen medewerkers positiever zijn over indicatoren omdat hun eigen inzichten en overtuigingen erin zijn verwerkt. Verder wordt verwacht dat als medewerkers vinden dat de prestatie-indicatoren van goede kwaliteit zijn, dat ze dan ook een positievere houding (*attitude*) krijgen ten opzichte van presteren (Hypothese 2), met name omdat ze dan streven naar doelen die ze zelf ook belangrijk vinden. Verder zullen ze meer sociale druk (*norm*) voelen om goed te presteren (Hypothese 3), omdat ook mensen in hun werkomgeving de samen opgestelde doelen graag willen halen. Tot slot stellen goede prestatie-indicatoren mensen beter in staat om goed te presteren (*control*, Hypothese 4). Dit komt met name doordat de prestatie-indicatoren mensen kunnen ondersteunen bij het maken van goede beslissingen. In lijn met de *theory of planned behavior* wordt verwacht dat deze factoren alle drie zorgen voor hogere medewerkersprestaties (Hypotheses 5 t/m 7).

### 3.1 Methode

De hypothesen werden statistisch getoetst met *structural equation modeling* aan de hand van de met een vragenlijst verzamelde data. Er was voor gezorgd dat de data en de bijbehorende resultaten zo betrouwbaar mogelijk zouden zijn door de vragenlijst van te voren goed te testen en door er alles aan te doen om te voorkomen dat er *common method bias* zou zijn. Bovendien zijn er verschillende controles gedaan om te kijken of de gevonden resultaten robuust zijn.

De vragenlijst was ingevuld door paren van medewerkers en hun leidinggevenden die aan de volgende criteria voldeden: (1) ze werkten al minimaal een jaar in hun huidige functie, (2) de medewerkers hadden een uitvoerende functie in het primaire proces van de organisatie en (3) de leidinggevenden gebruikten prestatie-indicatoren om de prestaties van





**Figuur 2** Schematische weergave van het verklarende model voor de relatie tussen medewerkers betrekken bij de ontwikkeling van prestatie-indicatoren en medewerkersprestaties vanuit het perspectief van medewerkers, inclusief resultaten

hun medewerker te meten. Omdat het onmogelijk was om voorafgaand aan het nemen van de steekproef te weten wie aan deze criteria voldeed, werd gebruik gemaakt van een sneeuwbalsteekproef: mensen die aan het onderzoek meewerkten werden gevraagd om ook anderen te noemen die aan deze criteria voldoen (Salganik & Heckathorn, 2004). Uiteindelijk hadden 95 medewerkers en 88 leidinggevenden de vragen ingevuld die voor dit model relevant waren en daarmee beschikten we over de data van 88 complete paren. Deze respondenten waren werkzaam in allerlei soorten functies, organisaties en sectoren.

De mate waarin medewerkers betrokken zijn bij de ontwikkeling van de prestatie-indicatoren waarmee hun prestatie gemeten wordt, werd in dit onderzoek gemeten met de bestaande schaal van Abernethy en Bouwens (2005; Cronbachs alfa = 0,94). Voor de kwaliteit van de prestatie-indicatoren zijn vijf items van Moers (2006) gebruikt die meten hoe gevoelig de indicatoren zijn voor de acties van de medewerkers, hoe precies ze relevante aspecten van hun prestatie meten en hoe verifieerbaar ze zijn (Cronbachs alfa = 0,80). De schalen voor attitude, norm en control hebben we zelf geconstrueerd op basis van de richtlijnen die er zijn voor het ontwikkelen van *theory-of-planned-behavior* vragenlijsten (Darker & French, 2009; Fishbein & Ajzen, 2010; Francis et al., 2004). Cronbachs alfas waren 0,87 voor *attitude*; 0,86 voor *norm*; en 0,61 voor *control*. Medewerkersprestaties werden gemeten met de veelgebruikte door Podsakoff en MacKenzie (1989) tot vijf items ingekorte schaal van Williams en Anderson (1991) die in eerdere onderzoeken een grote samenhang vertoonde met objectieve prestatie (Burney, Henle, & Widener, 2009; Cronbachs alfa = 0,91).

### 3.2 Bevindingen

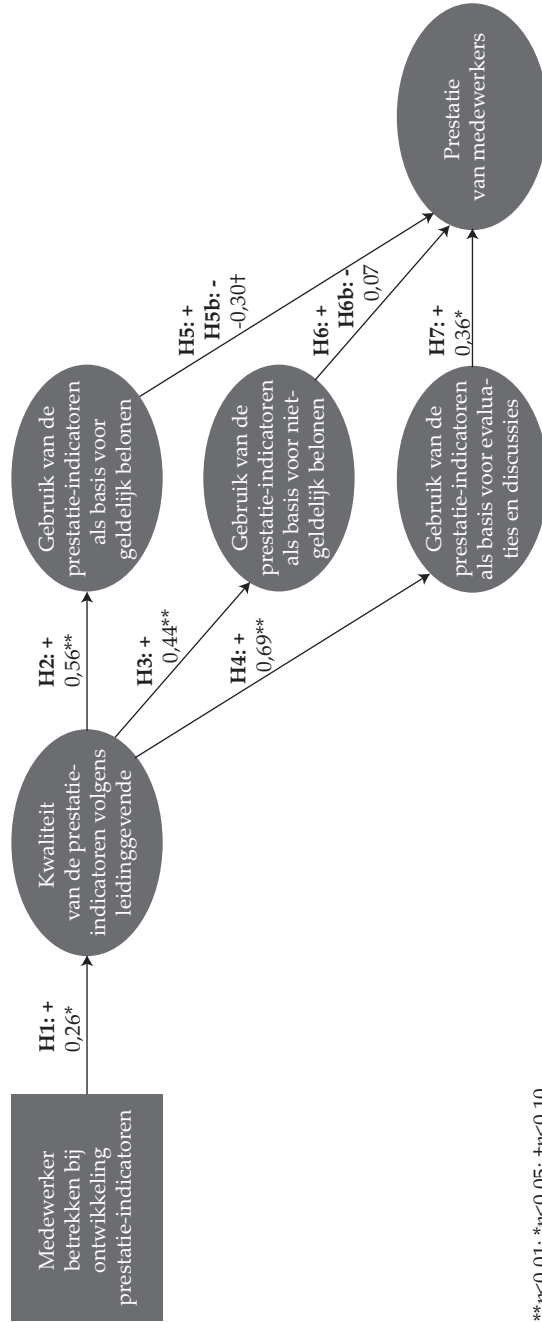
Figuur 2 geeft de resultaten van het onderzoek. De diverse robuustheidscontroles die we hebben gedaan zijn consistent hiermee. Allereerst wordt Hypothese 1 ondersteund. Dat wil zeggen dat participatie van medewerkers in het ontwikkelen van prestatie-indicatoren zorgt voor prestatie-indicatoren die volgens medewerkers een hoge kwaliteit hebben. Verder blijken kwalitatief goede prestatie-indicatoren zoals verwacht gerelateerd te zijn aan een hogere *attitude*, *norm* en *control* (Hypotheses 2 t/m 4). Anders dan de verwachtingen worden Hypotheses 5 en 6 niet ondersteund door de data. Er is wel een verband gevonden tussen *control* en *medewerkersprestaties* (Hypothese 7). Samengevat komt het erop neer dat medewerkersprestaties kunnen worden bevorderd door samen prestatie-indicatoren te ontwikkelen omdat de kwaliteit van prestatie-indicatoren in de ogen van medewerkers hierdoor kan worden verhoogd, en doordat kwalitatief goede prestatie-indicatoren medewerkers beter in staat stellen om goed te presteren.

## Hoofdstuk 4

Hoofdstuk 3 probeerde te verklaren hoe samen met medewerkers prestatie-indicatoren ontwikkelen kan leiden tot betere prestaties van medewerkers vanuit het perspectief van de medewerker zelf. In Hoofdstuk 4 wordt ditzelfde verband verklaard, maar dan gezien vanuit leidinggevenden. Het theoretische verklarende model is weergegeven in Figuur 3. Op basis van de *agency theory* (zie voor een uitgebreide uitleg van deze theorie Eisenhardt, 1989; Kunz & Pfaff, 2002; Lambert, 2007) en *self-determination theory* (Ryan & Deci, 2000) zijn acht hypothesen opgesteld. Hypothese 1 gaat ervan uit dat ook leidinggevenden vinden dat de kwaliteit van prestatie-indicatoren beter is als medewerkers worden betrokken bij de ontwikkeling ervan. Dit komt omdat dan de specifieke kennis die medewerkers hebben over hun werk kan worden geïntegreerd in de prestatie-indicatoren. Ook medewerkers hebben hier belang bij: als de prestatie-indicatoren hun prestaties goed weergeven, zullen ze meer erkenning krijgen voor hun inspanningen.

Voor leidinggevenden zijn prestatie-indicatoren vooral nuttig omdat ze gebruikt kunnen worden om in de gaten te houden of medewerkers hun werk wel goed doen en om op basis daarvan medewerkers al dan niet te belonen. Hoe beter de kwaliteit van de prestatie-indicatoren, hoe beter de indicatoren gebruikt kunnen worden als basis voor beoordeling en beloning van medewerkers. We maken onderscheid in verschillende soorten beloningen: geldelijk belonen, niet-geldelijk belonen in de vorm van het geven van promotie of meer verantwoordelijkheden, en verbale beloningen in de vorm van het evalueren en bediscussiëren van iemands prestaties. Hypothesen 2 tot en met 4 stellen dat leidinggevenden de prestatie-indicatoren eerder zullen gebruiken voor alle vormen van belonen als zij van betere kwaliteit zijn.

In principe zijn alle soorten beloningen bedoeld om de kloof te dichten tussen wat medewerkers willen bereiken en wat de organisatie wil bereiken. Met andere woorden, ze proberen medewerkers te stimuleren om beter te presteren. Dit komt overeen met de *agency theory* en leidt tot hypothesen 5 tot en met 7: naar mate leidinggevenden de prestatie-indicatoren meer gebruiken om medewerkersbeloningen op te baseren zullen medewerkers gemiddeld beter presteren. Echter, mensen hebben tegenwoordig een ander beeld van een geslaagde carrière dan vroeger. Vroeger bleven mensen vaak hun hele loopbaan bij één organisatie werken en speelden extrinsieke beloningen een belangrijke rol (Rosenbaum, 1979). Tegenwoordig switchen mensen sneller van organisatie en zijn ze op zoek naar intrinsiek motiverende banen (Hall, 1996, 2004). In intrinsiek



\*\*p<0,01; \*p<0,05; †p<0,10

**Figuur 3** Schematische weergave van het verklarende model voor de relatie tussen medewerkers betrekken bij de ontwikkeling van prestatie-indicatoren en medewerkersprestaties vanuit het perspectief van leidinggevenden, inclusief resultaten

motiverende banen liggen de doelen van medewerkers en organisaties vaak veel dicht bij elkaar en dus zijn er niet altijd extrinsieke beloningen meer nodig om mensen te stimuleren om beter te presteren. Sterker nog, als mensen al intrinsiek gemotiveerd zijn, kunnen extrinsieke beloningen juist zorgen voor een lagere motivatie en als gevolg daarvan prestatie (Deci, Koestner, & Ryan, 1999; Falk & Kosfeld, 2006; Gagné & Deci, 2005; Wong-On-Wing, Guo, & Lui, 2010). Op basis hiervan wordt verwacht dat de extrinsieke geldelijke en niet-geldelijke beloningen zullen leiden tot een verlaging van medewerkersprestaties (Hypotheses 5a en 6a). Voor Hypothese 7 wordt geen alternatieve hypothese opgesteld, want *self-determination theory* verwacht dezelfde relatie tussen verbale beloningen en medewerkersprestaties als *agency theory* (Deci, et al., 1999; Eisenberger & Cameron, 1996). Dit komt doordat deze vorm van belonen geen negatief effect heeft op iemands intrinsieke motivatie omdat het de autonomie van een individu in zijn waarde laat.

Een voorwaarde voor Hypotheses 1 tot en met 7 is dat medewerkers meer specifieke kennis hebben van hun werk dan hun leidinggevende. Als dat niet het geval was, dan was het voor leidinggevend $\ddot{e}$ n überhaupt niet nodig geweest om prestatie-indicatoren te hebben. We gaan ervan uit dat een dergelijke asymmetrie in informatie er altijd is, maar dat de mate waarin die er is kan verschillen. Hypothese 8 stelt dat de verbanden sterker zijn naarmate er meer informatieasymmetrie is tussen medewerkers en leidinggevend $\ddot{e}$ n over het werk van de medewerkers.

#### 4.1 Methode

Het theoretische verklarende model is getest op basis van hetzelfde vragenlijstonderzoek als in paragraaf 3. Er waren 86 paren die alle voor dit model relevante vragen hadden ingevuld. Wederom werd gebruikgemaakt van *structural equation modeling* om de hypothesen te toetsen en er zijn weer een groot aantal controles uitgevoerd om te checken of de gevonden resultaten robuust zijn.

De mate waarin medewerkers betrokken zijn bij de ontwikkeling van de prestatie-indicatoren waarmee hun prestatie gemeten wordt en de prestaties van medewerkers werden op precies dezelfde wijze gemeten als in het onderzoek van Paragraaf 3. Voor de kwaliteit van de prestatie-indicatoren werd ook dezelfde schaal gebruikt, maar nu ingevuld door leidinggevend $\ddot{e}$ n in plaats van medewerkers, en één item dat minder relevant was voor leidinggevend $\ddot{e}$ n is eruit weggelaten (Cronbachs alfa = 0,72). De mate waarin de leidinggevend $\ddot{e}$ n de prestatie-indicatoren gebruiken als basis van de verschillende soorten beloningen is gemeten met de schaal van Moers (2006), met uitzondering van één item waarvoor

zowel in de pretest als na de echte meting bleek dat hij niet goed bij de schaal paste. Cronbachs alfa was 0,84 voor het gebruik van de prestatie-indicatoren voor geldelijk belonen; 0,88 voor niet-geldelijk belonen; en 0,89 voor evaluaties en discussies.

## 4.2 Bevindingen

De resultaten van onze analyses staan in Figuur 3 en wederom wijzen de robuustheidscontroles op dezelfde conclusies. De data ondersteunen Hypothese 1: als medewerkers worden betrokken bij de ontwikkeling van prestatie-indicatoren, vinden leidinggevenden deze indicatoren gemiddeld van hogere kwaliteit. Verder blijkt dat leidinggevenden kwalitatief goede prestatie-indicatoren vaker gebruiken als basis voor de beloning van medewerkers (Hypotheses 2 t/m 4). Daarnaast vonden we een positief verband tussen verbale beloningen in de vorm van evaluaties of discussies en medewerkersprestaties. Dit komt overeen met Hypothese 7. Er is geen verband gevonden voor de andere beloningsvormen met prestatie, waardoor zowel Hypothese 5 en 6 als de alternatieve hypothesen 5a en 6a niet ondersteund worden. Er ook geen verband gevonden voor het verwachte versterkende effect van informatieasymmetrie (Hypothese 8). Dit komt waarschijnlijk omdat er sowieso altijd sprake is van informatieasymmetrie. Samengevat betekent dit dat leidinggevenden medewerkersprestaties kunnen stimuleren door samen met medewerkers prestatie-indicatoren te ontwikkelen om zo de kwaliteit van de prestatie-indicatoren te verbeteren en deze indicatoren vervolgens te gebruiken als basis voor evaluaties van en discussies met medewerkers.

## Hoofdstuk 5

De drie studies wijzen uit dat het samen met medewerkers ontwikkelen van prestatie-indicatoren op verschillende manieren tot betere medewerkersprestaties kan leiden. Allereerst zorgt deze ontwikkelmethode ervoor dat de kwaliteit van de prestatie-indicatoren beter wordt, zowel voor de medewerkers als voor hun leidinggevenden. Kwalitatief goede prestatie-indicatoren stellen medewerkers in staat om beter te presteren en geven leidinggevenden een goed instrument om de discussie aan te gaan met medewerkers. Beide leidt dit tot betere prestaties van medewerkers.

De combinatie van methoden die zijn gebruikt voor dit onderzoek heeft veel inzicht opgeleverd in waarom medewerkers beter gaan presteren als ze worden betrokken bij het ontwikkelen van de prestatie-indicatoren

waarmee hun prestatie gemeten wordt. Het actie-onderzoek liet zien hoe deze prestatieverbetering in de praktijk tot stand komt en liet zien dat er sprake was van causaliteit: eerst werden prestatie-indicatoren gemaakt samen met medewerkers en pas daarna vonden de positieve effecten op medewerkersgedrag en afdelingsprestatie plaats. De studie van Hoofdstuk 3 maakte het mogelijk om de resultaten uit het actie-onderzoek statistisch te toetsen voor een brede steekproef bestaande uit medewerkers en leidinggevenden in allerlei soorten banen, organisaties en branches. Hoofdstuk 4 voegt nog een tweede verklaring toe aan de gevonden verklaring voor het verband tussen samen prestatie-indicatoren ontwikkelen en medewerkersprestaties door ook vanuit het perspectief van de leidinggevende tegen dit vraagstuk aan te kijken. Als de modellen uit Hoofdstuk 3 en 4 tegelijkertijd getoetst worden, blijkt dat ze allebei significant blijven en ze voegen dus allebei iets toe.

Waar het actie-onderzoek van Hoofdstuk 2 net als andere studies een direct verband vond tussen samen prestatie-indicatoren maken en prestaties, was dat in de vragenlijstonderzoeken van Hoofdstuk 3 en 4 niet het geval. Blijkbaar is niet zomaar iedere manier van medewerkers betrekken bij de ontwikkeling van prestatie-indicatoren voldoende. Waarschijnlijk moet gebruik gemaakt worden van een uitgebreid ontwikkelingsproces om daadwerkelijk prestatieverbeteringen te bewerkstelligen. Verder is het belangrijk om medewerkers niet de vrije hand te geven in het ontwikkelen van prestatie-indicatoren. Het gaat er juist om om echt samen de prestatie-indicatoren te ontwikkelen, zodat je het beste van beide partijen kunt combineren. Een voorbeeld van een succesvol ontwikkelingsproces is gegeven in Hoofdstuk 2. Overigens is nog niet bekend welke onderdelen van de ontwikkelingsproces nu echt essentieel zijn om goede resultaten te behalen. Hier is meer onderzoek voor nodig.

De resultaten van dit onderzoek geven een idee van hoe kwalitatief goede prestatie-indicatoren kunnen leiden tot betere medewerkersprestaties. Organisaties die deze resultaten willen gebruiken moeten zich ervan bewust zijn dat het in specifieke organisaties wel eens anders kan werken. Zij kunnen het best eerst goed onderzoeken welke factoren het belangrijkste zijn in hun organisatie. Er is meer onderzoek nodig om te weten te komen hoe situatie-specifiek de resultaten van het huidige onderzoek zijn. Vooral over de invloed van beloningen op prestaties is nog te weinig bekend. Het idee dat geldelijk belonen standaard zorgt voor betere resultaten is achterhaald. In sommige gevallen kan dit nog steeds zo werken, maar uit andere onderzoeken is gebleken dat het introduceren van bonussystemen ook een (blijvend!) negatief effect kan hebben. Er is echter nog weinig bekend over onder welke omstandigheden het nu juist wel of niet werkt. Hiernaar is meer onderzoek nodig.

# CHAPTER 1

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Introduction





# CHAPTER 1

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Bianca A.C. Groen

## 1.1 Introduction and overview

*Why do employees perform better if they are involved in developing the performance measures used to measure their performance?* This is the central question of this doctoral thesis. Asking this question implies that I started out assuming co-developing performance measures can have a positive effect on employee job performance. I based this assumption on findings of various previous studies (e.g. Abernethy & Bouwens, 2005; Hunton & Gibson, 1999; Kleingeld, Van Tuijl, & Algera, 2004). These studies were inconclusive about how this effect comes about. However the reasons for increases in employee job performance through co-developing performance measures together with employees is important: it may help us understand by what means positive employee-performance effects can be generated. This is something many different business-administrative scholars and practitioners are aiming for.

Co-developing performance measures encompasses developing performance measures in close cooperation with the employees whose performance is going to be measured. In the first study of this dissertation, I used a true co-development process to develop and provide initial empirical support for a practically relevant causal model which explains how co-developing performance measures leads to better employee job performance. Developing and testing such an explanatory model is the main contribution of this dissertation. The first study had an additional contribution: it also resulted in a detailed description of guidelines to co-develop performance measures. After the first action study, a large-scale survey study was conducted to further test the developed model. Additionally, another theoretical model was developed and tested by means of the same survey. This model explains the relation between co-developing performance measures and employee job performance from the perspective of managers rather than from the perspective of employees which was central in the previous studies.

I examined my research question in three studies which are reported in the Chapters 2-4 in this dissertation. With this thesis I try to reach a broad audience of both researchers and practitioners. Practitioners who are only interested in the practical implications of this research are referred to Section 5.3. Chapters 1 and 5 as well as the Dutch summary are written in a way to be understandable for all types of readers, also those without a lot of background in social sciences. Chapters 2-4 are a bit more specialistic in nature since they are in the form in which they will be submitted to or have been published in international peer-reviewed journals. The studies described in these chapters overlap on certain aspects, and differ on

other aspects. Table 1.1 gives an overview of the contents of these three academic chapters. Overlapping aspects have been marked.

This dissertation is an attempt to integrate knowledge from the fields of management accounting and organizational behavior. As De Haas and Kleingeld (1999) pointed out, both fields do study performance measurement from a behavioral perspective, but they tend to do so in isolation. By writing for these two different audiences, I try to enrich the management accounting literature with organizational behavior insights and vice versa. Chapters 2 and 4 are mainly written for scholars with a background in management accounting, and Chapter 3 for scholars with a background in organizational behavior. In each of these Chapters I will briefly introduce all concepts used, so each of them can be read separately. For those readers who would like more information about the concepts used in this dissertation, I will provide more information on each of them in Section 1.2. Furthermore, Section 1.3 gives a description of how and why this PhD study was started in the first place and offers an overview of the research on which this study was built. Section 1.4 summarizes this Introduction and gives a short overview of the rest of the chapters.

**Table 1.1** Comparative overview of the contents of Chapters 2-4

	Chapter 2	Chapter 3	Chapter 4
Target audience	Management accounting scholars	Organizational behavior scholars	Management accounting scholars
Explains the behavior of	Operational employees	Operational employees	Supervising managers
Type of PM participation	Co-developing performance measures following a strict protocol	All kinds of <i>PM participation</i>	All kinds of <i>PM participation</i>
Dependent variable	<i>Employee initiative</i>	<i>Employee job performance</i>	<i>Employee job performance</i>
Theoretical framework	Theory of planned behavior	Theory of planned behavior	Agency theory <i>and</i> Self-determination theory
Research method	Action research	Survey	Survey

## 1.2 Terminology

This section has the purpose of explaining all terms used in this dissertation to both novices and advanced readers in this topic. I start in Section 1.2.1 with explaining how “performance measures” are defined. After that, I introduce the main variables of the research question: *PM participation* and *employee job performance* (Section 1.2.2). Moreover, Section 1.2.3 gives an overview of the theories, and Section 1.2.4 of the methods used to answer the research question.

### 1.2.1 Performance measures

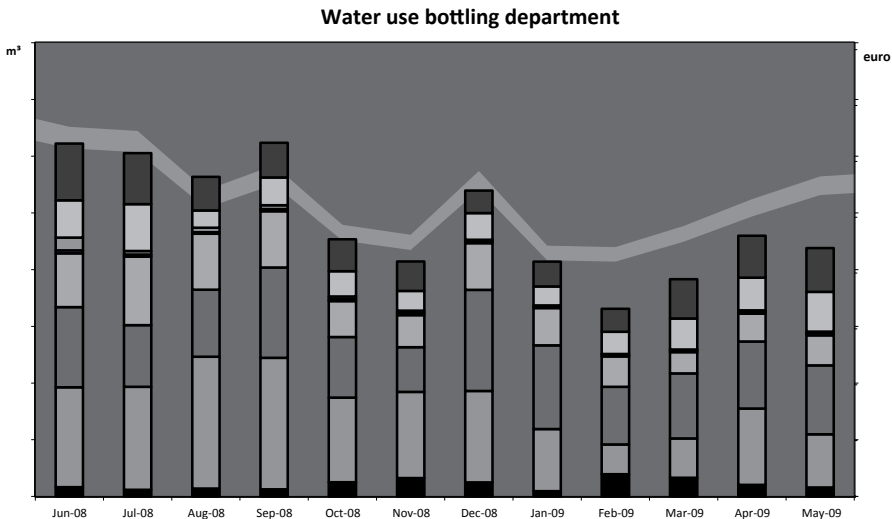
Performance measures are defined as “everything used to measure the job performance of employees”. Employees can be both managerial and non-managerial, however in this dissertation I only look at performance measures of non-managerial employees. Concretely, performance measures are metrics used to quantify the efficiency and/or effectiveness of actions (Neely, Gregory, & Platts, 1995). Moreover, performance measures often have many other purposes (Franco-Santos et al., 2007; Van Veen-Dirks, 2009; Wiersma, 2009). To name a few, performance measures can be (but are not necessarily) used to:

- measure individual or group performance (e.g. Mendibil & MacBryde, 2005);
- formally evaluate and reward employees (e.g. Jenkins Jr., Mitra, Gupta, & Shaw, 1998; Stajkovic & Luthans, 1997, 2003);
- facilitate learning and improvement by giving feedback (e.g. Garvin, 1993);
- measure financial and/or non-financial performance (e.g. Ittner & Larcker, 2003; Kaplan & Norton, 1996);
- align operational activities with strategy (e.g. Chenhall, 2005; Kaplan & Norton, 1996; Malina & Selto, 2001; Simons, 2000);
- facilitate decision-making by providing the necessary information to make good decisions (Demski & Feltham, 1976; Sprinkle, 2003);
- influence decisions and actions of managers and employees by motivating and controlling them (Demski & Feltham, 1976; Sprinkle, 2003);
- enable employees, i.e. they facilitate rather than control their employees (Ahrens & Chapman, 2004; Wouters & Wilderom, 2008).

The performance measures of Chapter 2 have very specific characteristics. They are used to measure departmental performance, they are not used to formally evaluate and reward employees, they are meant to facilitate learning and improvement, they are a derivative from the corporate

strategy, they are decision facilitating and they are enabling. In contrast, the performance measures of the other chapters are performance measures in the broadest sense of the word; i.e. they can be, but are not necessarily, used for all the different purposes described.

An example of one of the performance measures in Chapter 2 is given in Figure 1.1. This performance measure shows the amount of water used by a department per month over a one-year period. It also contains a standard against which the performance can be compared to the performance in the past which was adjusted for the amount of products produced in each period (the light-colored line in the middle). The scale is purposely left blank because these numbers are confidential, but in the original version people could not only see how much water was used in a certain period, but also how much that water had cost.



**Figure 1.1** Example of a departmental performance measure: water usage during various production months

### 1.2.2 Main variables

Two variables are central in this study: “PM participation” and “employee job performance”. All three of our studies try to explain the relation between these two variables. But because of the differences between the studies’ research methods (see Section 1.2.4), the operationalization of these variables differs. This section sets out their definitions and operationalizations as used in this dissertation.

### 1.2.2.1 PM participation

I tried to grasp the essence of the co-development of performance measures by means of the variable “PM participation”. *PM participation* involves substantial influence (rather than only involvement) of employees on the content of the performance measures used to measure their performance. Whenever I told people about my dissertation, I noticed they often think *PM participation* is comparable to “participation in goal setting” or “participative budgeting”, which are two extensively researched topics (the former within organizational behavior, the latter mostly by management accounting scholars). Both concepts deal with determining the degree of difficulty of a goal (or budget), together with employees. They are indeed within the larger domain of the area of *PM participation*, but *PM participation* is broader than that. Besides setting the target it also includes co-developing the measures with which one best assesses the actually realized performance. According to Neely et al. (Neely, Bourne, Mills, Platts, & Richards, 2002; Neely, Richards, Mills, Platts, & Bourne, 1997), besides a target, each performance measure must have a name; a purpose; a formula; a known frequency of measuring; specific source(s) of data; and a locus of responsibility. Moreover, *PM participation* regards influence of employees in the making of performance measures during all the developmental phases: design, implementation, and maintenance (cf. Bourne, Mills, Wilcox, Neely, & Platts, 2000).

Those who think *PM participation* is the end of managerial control over what is measured can put their mind at rest. Involving employees in the performance measure development process does not mean managers cannot be involved as well. On the contrary, the influence of managers in this process is of vital importance for developing useful and sustainable performance measures (Gravesteijn, Evers, Wilderom, & Molenveld, 2011; Groen, Evers, et al., 2011).

In the action research of Chapter 2 *PM participation* was operationalized by developing performance measures together with the maintenance technicians of the bottling lines. Section 2.3.3 gives an overview of the exact way in which this was done. In Chapter 3 and 4 we used the operationalization of Abernethy and Bouwens’s (2005) “influence on the system design” scale. This scale resembles our definition of *PM participation*: the extent of influence employees feel they have had on the design of the performance measures they are measured by (Abernethy & Bouwens, 2005). The items reflect employees’ influence during all the developmental phases. Hence the items deal with the extent of influence employees feel to have had on the performance measures’ content and

appearance, their provision of data to enable their regular reporting, their incorporation in the daily routine, and their continuous improvement.

### 1.2.2.2 Employee job performance

With the project for co-developing performance measures in the company of our action study of Chapter 2 we wanted to (and did) increase “employee initiative” and “departmental performance”. *Employee initiative* is self-starting, proactive, persistent and pro-company behavior of individual employees (Frese & Fay, 2001a) and is an increasingly important part of contemporary job performance (Campbell, 2000; Crant, 2000; Frese & Fay, 2001b). The increase in *employee initiative* was determined by observations and, at the same time, we conducted a survey within the company to see if the hypothesized antecedents of employee initiative were also statistically related to it. In this survey we used Frese and Fay’s (2003) frequently used and thoroughly validated scale for employee initiative.

Besides *employee initiative*, we measured changes in *departmental performance* as well. This was done with the developed performance measures: we reconstructed the measures for the period before the performance measures were developed, based on data already present in the IT-systems of the company.

In the survey study we used individual *employee job performance* as the prime dependent variable. Getting “objective” performance data in this study was impossible since the survey participants were all members of very different organizations, which reduces the chance for valid objective comparisons of performance. Therefore, we operationalized *employee job performance* with a frequently used scale to be completed by managers. This scale is applicable to all kinds of jobs and industries and it has been shown to correlate highly with objective measures of performance (Burney, Henle, & Widener, 2009). The scale was initially developed by Williams (see Williams & Anderson, 1991), and later revised and shortened by Podsakoff and MacKenzie (1989).

### 1.2.3 Theory

*“Given the complexity of our working processes, it is impossible to develop useful performance measures for our work.”—a maintenance technician*

This was the first response when some of the maintenance technicians heard about the company’s plans to develop performance measures for the maintenance department of its bottling lines. If this statement was prototypical for the maintenance technicians’ general opinion—and it



1 transpired later at that time it was—this meant our intended performance measurement project would be a huge challenge. A challenge which eventually gave us insight into how useful performance measures can be developed together with employees and into how these co-developed performance measures support the increase of (in this case: departmental) performance.

Without realizing it, the maintenance technician of the quote at the beginning of this section touched upon one of the most important reasons to develop performance measures together with operational employees: these employees typically have complex specific and thus better knowledge of their work activities. Developing performance measures together with them makes it possible to include this specific knowledge into the performance measures. Consequently, the measurement properties (or: quality) of these co-developed performance measures will be better than when employees are not involved in the development process.

I use the theory of planned behavior (Ajzen, 1991; recently re-introduced as the “reasoned action model” by Fishbein & Ajzen, 2010) to examine how this better quality of the performance measures leads to better employee job performance from the perspective of the employee (in Chapters 2 and 3). Furthermore, I use the agency (e.g. Eisenhardt, 1989) and self-determination (e.g. Ryan & Deci, 2000) theories to examine the same question from the perspective of the manager (in Chapter 4). What follows first now is a depiction of the essence of these theories for those who are not familiar with them.

### 1.2.3.1 Theory of planned behavior

The theory of planned behavior has a long and influential history in social sciences. Its development started in the sixties and the theory is still on the go, as is shown by two recent overview publications which will probably start a whole new stream of research around this theory (Fishbein & Ajzen, 2010; Hennessy, 2012). The theory addresses how people can be motivated to behave in certain ways. More specifically, it can be used to predict, explain, and change various kinds of behaviors.

The theory of planned behavior has been applied to many behavioral contexts, such as health, safety, intergroup relations and work motivation (Armitage & Conner, 2001; Fishbein & Ajzen, 2010) and also sporadically to fields related to this dissertation such as organizational behavior (e.g., Dunn and Schweitzer, 2005), management accounting (e.g., Hill et al., 1996) and change management (e.g., Jimmieson et al., 2008). To our knowledge the theory has not yet been used to explain employee initiative or job

performance before. This dissertation will show how it is also applicable to these kind of behaviors.

The part of the theory of planned behavior which is used in this study is the part which says that people's intention to perform any particular kind of behavior is dependent upon three variables:

- their attitude towards performing the behavior ("*attitude*");
- the amount of social pressure they feel to perform the behavior ("*norm*"); and
- the extent to which people feel capable of performing the behavior ("*control*").

According to the theory of planned behavior, people's behavior can be changed by directing an intervention at one or more of these antecedents (Ajzen, 2006). Interviews with or a survey completed by the target group may give more insight into which of the three antecedents are important for a particular behavior by a particular group of people. In this dissertation I will do this for the behaviors "employee initiative" and "employee job performance" for a variety of operational employees in the lowest hierarchical level of an organization, such as shop floor employees and professionals who work in various jobs, organizations and industries. This will give an idea of how employee initiative/job performance of operational employees can be influenced in general.

### 1.2.3.2 Agency theory

The agency theory is seen as one of the major theoretical pillars of accounting (Kunz & Pfaff, 2002; Lambert, 2007). In this section, I will only describe those parts of the agency theory directly relevant for the present research. Please see the following overview papers for a fuller and more nuanced overview of the agency theory (Eisenhardt, 1989; Kunz & Pfaff, 2002; Lambert, 2007).

Simply put, the agency theory deals with situations in which principals delegate work to agents (Eisenhardt, 1989). Principals usually delegate work to agents when the agent has more decision relevant knowledge than the principal (Abernethy, Bouwens, & Van Lent, 2004). This is called "information asymmetry". Agency theory's information asymmetry assumption is consistent with the main assumption of the current study. In the current study, the agents are non-managerial employees and the principals are their supervising managers. Here—where the principal-agent relation is an employee-manager relation—information asymmetry for example concerns specific knowledge on employees' working process and on their effort level.

1 Another important assumption of the agency theory is the existence of a conflict of interest between the agent and the principle. In an employee-manager relation this means the employee has other interests than the organization, for example, employees may prefer to dedicate as little time and effort to their work as possible, whereas this employee effort is vital for organizations to reach their goals (Kunz & Pfaff, 2002). It is the task of the manager to align the interests of the employees with those of the organization. One way to do that is to make use of a control system, which consists of a performance measurement system and a compensation system (Banker & Datar, 1989; Jensen & Meckling, 1992). Both are important in the current study: it looks at how to develop high quality performance measures and whether giving incentives based on these performance measures increases employee job performance.

*Developing high quality performance measures*—As has been said in the introduction of Section 1.2.3, the most important reason to involve employees in developing performance measures is to include their specific job-relevant knowledge in the performance measures (see e.g. the literature review of Shields & Shields, 1998). Yet the agency theory asserts—given employees' self-interestedness—that employees are unwilling to share private information if sharing it would not be beneficial to them. It is in the interest of the employee to upkeep the information asymmetry with their manager to be able to “game” the system; “i.e., take actions that increase pay-outs from the incentive contract without improving actual performance” (Baker, 1992, p. 600). Based on this, fervent adherents of the agency theory are often reluctant against participation of employees in developing performance measures, since that gives employees the opportunity to adjust the performance measures to their own needs which are per definition different from the interests of the organization.

Conversely, several scholars have used agency models to advocate the opposite (Baiman & Evans, 1983; Christensen, 1982; Penno, 1984). According to them *PM participation* will most likely increase, or at least never decrease the quality of the performance measures. They are convinced that during the co-development of the performance measures, managers will make sure the measures do at least include their own knowledge, and if they are lucky, involving employees in the development of the performance measures will give them extra information. But why would the employees give their managers extra information? Because sometimes employees are not aware of certain information gaps of their managers, or because there are gaps in the knowledge of the manager which are disadvantageous for the employees. Sections 2.4.3 and 4.2.1 give concrete examples of such situations.

*Using incentives to increase employee job performance*—Another part of the agency theory which is relevant for the current study is its claim that performance incentives *ceteris paribus* increase employee job performance, because incentives align the self-interest of the employee and the organization (Kunz & Pfaff, 2002). The agency theory suggests that people are inclined to perform better if they expect to receive a reward for good performance, because then putting effort in performing well will personally benefit them (Bonner & Sprinkle, 2002). Numerous studies have found support for this, as is shown by several meta-analyses (Jenkins Jr., et al., 1998; Stajkovic & Luthans, 1997, 2003).<sup>1</sup>

### 1.2.3.3 Self-determination theory

Agency theory's claim that performance incentives lead to better employee job performance has been criticized based on many empirical studies which show the opposite. For example, Weibel et al. showed in their meta-analysis that the relation between giving monetary incentives and performance is negative for already interesting tasks (Weibel, Rost, & Osterloh, 2010). This is still in line with agency theory, because agency theory assumes the interest of the employee and the organization are different (Kunz & Pfaff, 2002). However, in practice this is not always the case; at least some (and I think many; see Section 4.5.1) employees are interested in the reaching of the same goals as the organization. If that is the case, it is in the interest of the organization to keep that so-called "autonomous motivation" alive. This is what self-determination theory is about.

The relevant part of self-determination theory for this dissertation is the continuum it distinguishes from autonomous to controlled motivation (Ryan & Deci, 2000). Autonomous motivation refers to people's perception of having a choice to do something or not, whereas controlled motivation refers to the feeling of being pressured to do it (Gagné & Deci, 2005). When people are pressured to do something, they are less likely to be willing to put effort in the job and thus to perform well. Therefore, controlled motivation is thought to inhibit performance, whereas autonomous motivation should have a positive effect on performance (see Gagné & Deci, 2005 for an overview).

People generally perceive explicit incentives as a pressure (Deci, Koestner, & Ryan, 1999; Holmås, Kjerstad, Luråsd, & Straume, 2010). Thus, explicit incentives can lead to more controlled and therefore less autonomous

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<sup>1</sup>Note however that these studies mainly consist of low complexity tasks, whereas giving incentives and employee job performance may be moderated by task complexity (Stajkovic & Luthans, 2003).

motivation and consequently to less *employee job performance* (Deci, et al., 1999; Falk & Kosfeld, 2006; Wong-On-Wing, Guo, & Lui, 2010). With explicit incentives I mean for example monetary compensation such as bonuses or a raise or nonmonetary rewards such as getting a promotion or more responsibilities.

There is also a form of incentives which is found not to control, but to enable behavior. This type of incentives can be summarized as “verbal rewards”, such as an evaluation of or discussion with employees about what/how to improve. Meta-analyses show that when verbal rewards are used, autonomous motivation increases (Deci, et al., 1999; Eisenberger & Cameron, 1996). Therefore, verbal rewards probably have a positive influence on *employee job performance*.

### 1.2.4 Research methods

Let me—before I will explain which research methods I used in this dissertation—start with telling a little bit more about my research philosophy. In a way, the research methods someone uses often say a lot about the researcher. Personally, I am especially a supporter of the realistic and positivistic philosophies. Both assume a “scientific approach to the development of knowledge”, which “underpins the collection of data and the understanding of those data” (Saunders, Lewis, & Thornhill, 2009, p. 114). Supporters of the realistic philosophy try to describe the world as we see it, whereas the positivistic philosophy tries to capture the world in models which are tested using objective criteria.

In my opinion it is very important to study a phenomenon with various research methods, because every method has its weaknesses which can be overcome by the strengths of other research methods. Therefore, I chose to use two types of research methods in my PhD research: triangulated action research (Chapter 2) which is compatible with the realistic research philosophy, and a large-scale cross-sectional survey (Chapters 3 and 4) which is a positivistic approach. Mixing case studies and survey research makes it possible to achieve construct, internal and external validity; which is difficult if only one method is used (Modell, 2009). I will use this section to further explain the most relevant elements of the two methods used.

#### 1.2.4.1 Action research

Action research is a form of research in which researchers co-operate with the people under study in order to solve a practical problem and contribute to social science at the same time (Rapoport, 1970). Designing

and conducting research in real-world settings improves the exchange of knowledge between researchers and practitioners and can make research more relevant in practice (Anderson, Herriot, & Hodgkinson, 2001; Miller, Greenwood, & Hinnings, 1997; Otley, 2001; Rynes, Bartunek, & Daft, 2001; Van de Ven & Johnson, 2006). Action research is useful if researchers want to examine the process of change or improvement (Coughlan & Coughlan, 2002). This is the case in this study since I wanted to learn how involving employees in developing performance measures can lead to better employee job performance. At the same time, the company under study wanted to improve the performance of employees through co-developing performance measures with employees. This correspondence of interests gave me the opportunity to study what actually goes on when performance measures are being developed together with employees.

Since action research is a realistic rather than a positivistic approach, the validity of action research should be assessed with other criteria (Susman & Evered, 1978). Baskerville and Wood-Harper (1998) distinguish the following seven criteria which are all met in our research and thus makes action research appropriate.

- The research should be set in a multivariate social situation (here: the maintenance department of the bottling lines of a midsize manufacturing firm);
- the observations are recorded and analyzed in an interpretive frame (here: the research context is described in detail in Section 2.3.2);
- there was researcher action that intervened in the research setting (here: developing performance measures together with the employees, see Section 2.3.3);
- the method of data collection included participatory observation (here: the researcher worked at the company three days a week for more than a year and took detailed notes of her observations; see Section 2.3.4.1);
- changes in the social setting were studied (here: changes in *attitude, norm, control, employee initiative* and *departmental performance*);
- the immediate problem in the social setting must have been resolved during the research (here: increasing *employee initiative* and *departmental performance*);
- the research should illuminate a theoretical framework that explains how the actions led to the favorable outcome (here: the theory of planned behavior; see Section 2.2).

#### 1.2.4.2 Survey research

The action research of Chapter 2 allowed us to build a theoretical model based on practical experience in one company. Conversely, Chapter 3 used

a survey method in order to examine if this model holds when studying a broader range of organizations. The same method was used for Chapter 4 in which a model was tested based on literature, which was consistent with the results of the action study as well.

According to Van der Stede et al., surveys should meet the following requirements (Van der Stede, Young, & Chen, 2005):

- researchers should have a specific research objective in mind to be able to design the research accordingly (here: testing hypotheses with regard to how *PM participation* may be related to *employee job performance*; see Section 3.1 and 4.1);
- researchers should define their population and should be clear about their sample to be able to know what inferences can be drawn from the study (here: employees who are professionals or members of staff who carry out the work and their managers who use performance measures to measure their employees' performance in various jobs, organizations and industries; see Section 3.3.1, 4.3.1 and 4.3.2);
- the study should have a high internal validity (see Section 3.3.2. and 4.3.3 for how the survey was designed);
- data should be accurate (see Section 3.3.1 and 4.3.1 for how the data were gathered);
- researchers should accurately report how they ensured to meet these requirements (see the Methods sections of Chapter 3 and 4; Section 3.3 and 4.3).

## 1.3 Building blocks

This research is part of a stream of research with regard to the effects of employee participation in developing performance measures in which both of my promoters—Marc Wouters and Celeste Wilderom—were involved. This section gives an overview of other research of this stream and it will show how this study further contributes to it.

The main part of Wouters and Wilderom's research was done within the same company as the action study of Chapter 2 (in another department). More than ten MSc graduate students were coached by Wouters and Wilderom to help this company develop performance measures together with employees in operational jobs. These projects have resulted in several academic papers (Wilderom, Wouters, & Van Brussel, 2007; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Sportel, 2005; Wouters & Wilderom, 2008) and professional publications (e.g. Wilderom, Stertefeld, & Wouters, 2009; Wouters, Stertefeld, & Wilderom, 2007).

The main publication this dissertation builds on is Wouters and Wilderom (2008). They introduce how performance measures which support employees rather than only higher management can be developed; e.g. they describe which characteristics of the process of developing performance measures enhance the enabling nature of these measures. The characteristics they mention are:

- the development process should be based on experience;
- experimentation with performance measures is important; and
- the process should build on the professionalism of employees.

Moreover, Wouters and Wilderom (2008) presented the first results of their survey which investigated the relations of “professionalism”, “leadership style”, “team trust”, “work pressure” and “work satisfaction”.

The other papers deal in more detail with certain sub-aspects of the Wouters and Wilderom (2008) paper such as:

- the role of (informal) existing measures in the development of a performance measurement systems (Wouters & Sportel, 2005);
- using prototypes to facilitate experimentation and knowledge integration in the development of enabling performance measures (Wouters & Roijmans, 2011);
- extending the characteristics of successfully developing enabling performance measures with “transparency and employee ownership” and “using outside facilitators” (Wouters, 2009);
- a further (longitudinal) investigation of the survey results (Wilderom, et al., 2007).

In the meanwhile, several other projects have been done in other organizations: another manufacturing firm, two banks, a public sector call center, a real estate agency and a Vietnamese professional service firm (Evers, Overkamp, & Wilderom, 2009; Gravesteyn, et al., 2011; Groen, Evers, et al., 2011; Groen, Van de Belt, & Wilderom, in press; Koene, 2010; Molenveld, 2008a, 2008b, 2010; Verdonk, 2009). Overall, these studies have shown the possibility to develop performance measures together with employees and to derive positive effects out of it in various industries and countries. The most intensive study was the one in the public sector call-center which was led by Frank Evers. That study took place around the same time as my action study, so we have cooperated a lot to learn from each other’s experiences. The development project described in Chapter 2 was co-inspired by the project in that call-center.

Giving a detailed description of how performance measures can be developed together with employees was one of Chapter 2’s contributions to the literature. Herewith we extend Wouters and Wilderom (2008) and Wouters(2009) who identified important characteristics for the development



of enabling performance measures rather than concrete steps. Moreover, the study of Chapter 2 was the first to focus on actual performance improvement after the performance measures were developed. And the main contribution of this study to the literature was its description of how giving employees influence in the development of performance measures led to more *employee initiative* and better *departmental performance*.

The two survey studies of Chapter 3 and 4 had a similar goal and contribution: examining how *PM participation* can lead to more *employee job performance*. These were the first large-scale survey studies in our research stream (apart from the longitudinal within-company surveys which have been done by Groen, Evers, et al., 2011; Wilderom, et al., 2007; Wouters & Wilderom, 2008). Thus, they contribute to our stream of research because they can verify if similar results are being found using different research methods and in a broader population of work-floor employees.

## 1.4 Summary

Chapter 2 consists of the paper written about the action study at the beverage manufacturing company. I looked at how involving employees in developing their own performance measures eventually leads to more employee initiative from an employee perspective. My answer to this question is based largely on the theory of planned behavior.

This same theory is used to examine how PM participation increases employee job performance in Chapter 3, again from the perspective of the employee. For this study a survey was completed by 88 pairs of employees and their managers in various jobs, organizations and industries.

86 of these pairs also answered the items that were used to answer the same research question as in Chapter 3 but then from the perspective of the manager. We tested a theoretical model based on the agency and self-determination theories. This study is reported in Chapter 4.

In Chapter 5 I give an overview of the findings of these three studies. Moreover, I discuss their theoretical implications, including the limitations of the studies and future research suggestions directly derived from these limitations. Furthermore, I discuss the practical implications of this thesis research, including concrete tips for managers and consultants who want to increase employee job performance by involving employees in developing performance measures. In the very last section of this dissertation I am musing about how to extend the carried out research in the future.

# CHAPTER 2

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## Why do employees take more initiatives to improve their performance after co-developing performance measures? A field study

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- Academy of Management 2011 Annual Meeting
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- 5th Conference on Performance Measurement and Management Control
- University of Hong Kong
- University of Twente



# CHAPTER 2

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Bianca A.C. Groen

Marc J.F. Wouters

Celeste P.M. Wilderom

## ABSTRACT

Performance measurements may stimulate employee initiatives to improve operational performance, especially when employees themselves participate in the development of their own departmental performance measures. Using the theory of planned behavior, we examine why this occurs in a beverage manufacturing company where we helped bottling line maintenance technicians develop measures about the results of their own work. Our analyses are based on qualitative data gathered at 156 meetings, 34 semi-structured interviews, quantitative performance data from the company's information systems, and quantitative questionnaire data. We found that the participatory development process increased employees' attitude, perceived social pressure and perceived capability to take initiative. Moreover, the departmental performance improved when the jointly developed performance measures were put to use.

## 2.1 Introduction

The participation of employees is an important theme in management accounting research (e.g., Derfuss, 2009; Luft & Shields, 2007). Most studies investigate participation in budgeting: the amount of influence a subordinate manager has for setting his/her unit's budgets. Derfuss (2009) conducted a meta-analysis and found eleven positive consequences of participative budgeting that generalize across samples (e.g., the positive effect of budgetary participation on budget usefulness).

Yet the participation of employees may go beyond the setting of budgetary targets per se, extending to processes for developing and implementing management accounting systems (De Haas & Kleingeld, 1999; Eldenburg, Soderstrom, Willis, & Wud, 2010). Considering performance measurement systems (PMS) specifically, employees may be involved in and have influence on a panoply of factors, including: the conceptualization of performance measures, defining the measures, identifying required data, adapting IT systems, designing graphs and tables for the presentation of the measures, and even producing the periodic performance reports. There are only a few studies in management accounting that have investigated such a broader notion of participation in the development and implementation of PMS, and these generally found beneficial effects (i.e., Abernethy & Bouwens, 2005; De Haas & Algera, 2002; Hunton & Gibson, 1999; Kleingeld, et al., 2004; Li & Tang, 2009; Wouters & Wilderom, 2008).

Investigating participation in the development and implementation of PMS is valuable because so little is known about why performance measurement affects performance. Many studies have investigated relationships between performance measurement and organizational performance (e.g., Chenhall, 2005; Davis & Albright, 2004; De Geuser, Mooraj, & Oyon, 2009; Farrell, Kadous, & Towry, 2008; Grafton, Lillis, & Widener, 2010; Ittner, Larcker, & Randall, 2003; Kelly, 2010; Lee & Yang, 2010; Malina, Nørreklit, & Selto, 2007; Said, HassabElnaby, & Wier, 2003; Widener, 2006). These studies assume performance measurement affects the behavior of individuals within the organization, which in turn facilitates the achievement of organizational goals (Burney & Widener, 2007; Burney, et al., 2009; Covaleski, Evans, Luft, & Shields, 2003; Hall, 2008). However, detailed empirical investigations into how employee behavior mediates the relationship between PMS and performance remain scarce (De Leeuw & Van den Berg, 2010; Hall, 2010; Luckett & Eggleton, 1991; Webb, 2004).

This study focuses on participatory development of performance measures and a particular type of behavior, namely employee initiative.

Employee initiative is an increasingly important part of contemporary job performance (Campbell, 2000; Crant, 2000; Frese & Fay, 2001a) aimed at achieving continuous improvements in operational work processes. We define *PM participation* as the substantial impact of one or more employees on the content of the performance measures by means of which one (in this study: a department) is measured. We define *employee initiative* as self-starting, proactive, persistent and pro-company behavior of individual employees (Frese & Fay, 2001b). The central question of our study is: why is *PM participation* related to *employee initiative*?

This study investigates performance measurement at the operational level in the organization, where performance measures are quite specific to the operational processes (Franco-Santos, et al., 2007; McKinnon & Bruns 1992; Melnyk, Stewart, & Swink, 2004). We focus on enabling performance measures that are intended to facilitate the responsibilities of employees, rather than primarily as control devices deployed by senior management (Adler & Borys, 1996; Ahrens & Chapman, 2004; Free, 2007; Wouters & Wilderom, 2008). Employees know a great deal about operational processes and the data that are generated, making it important to use their knowledge to develop and implement performance measures (Masquefa, 2008). We do not investigate the use of performance measures for formal evaluation and incentive purposes.

We intend to contribute to the management accounting literature on performance measurement systems by using a psychological theory to investigate our research question. This is important because psychological theories may give more complete and valid explanations of performance measurement effects (Covaleski, et al., 2003; Kleingeld, et al., 2004), thereby extending the existing management accounting body of knowledge on performance measurement. The theory we use in this study (the theory of planned behavior) has not yet been applied to employee initiative behavior, but it has been used to explore and stimulate various other kinds of behavior, such as quitting smoking, using condoms, and using public transportation (Fishbein & Ajzen, 2010). We show *employee initiative* behavior can also be studied through the same theoretical lens. Using this theory contributes to the management accounting literature because it investigates motivational, social and cognitive variables at the same time, which most likely are the major behavioral effects resulting from participation (Jeong, 2006). Earlier management accounting research has included motivation and/or capability variables, but social effects have been less investigated. In sum, the present study intends to provide an overall explanation for why *PM participation* is related to *employee initiative* by investigating all three of these important mediating variables simultaneously.

A secondary contribution of this study lies in the report in substantive detail precisely how *PM participation* actually came about and was shaped. This kind of process has received scant attention in the accounting literature heretofore (Otley, 1999; Abernethy & Bouwens, 2005). We report on a one-year field study in a beverage manufacturing company where we jointly developed performance measures with their maintenance technicians. Using action research makes it possible to richly describe how employees reacted before, during and after they participated in developing their own performance measures.

This study was conducted in order to develop a theoretical explanation for why *PM participation* is related to *employee initiative*, and to provide initial empirical support for it. We did this by using systematic combining—continually going back and forth between theory and data (Dubois & Gadde, 2002). However, for the sake of clarity, from the outset we structure this chapter around the developed model, which provides a structure that helps to convey the theoretical and empirical insights gained throughout this study about the effects of participative development of performance measures.

This chapter is structured as follows. In Section 2.2 we articulate the theory that supports our model, and in Section 2.3 we lay out our methodology. Section 2.4 presents the empirical results with regard to qualifying and refining our basic model. Section 2.5 discusses a range of implications and limitations of our overall account.

## 2.2 Theory

We define *PM participation* as the substantial impact of one or more employees on the content of the performance measures by means of which one (in this study a department) is measured. This may include any aspect of the performance measures distinguished by Neely et al. (2002): the name; the purpose; the target; the formula; the frequency of measuring; the source of data; and the responsibility. By actually participating in the development of performance measures, employees' ideas about performance measures are taken seriously (Nørreklit, 2000). The goal is manifestly practical—to make performance measures useful for the involved employees in their everyday work. Of course, participation will not be a completely autonomous affair. For example, there may be guidance in the form of strategic priorities, constraints regarding the timely availability of resources for this developmental process, and project deadlines that the employees have to consider. *PM participation*

may provide positive effects to the organization if it creates better quality performance measures (Abernethy & Bouwens, 2005). Good measurement properties of performance measures (such as sensitivity, precision, and verifiability) can reduce costly management control issues (Moers, 2006).

*PM participation* is not the same as the interactive use of performance measurement systems, which has also been investigated empirically (e.g., Bisbe & Otley, 2004; Henri, 2006; Widener, 2007). In terms of the framework developed by Ferreira and Otley (2009), the interactive use refers to how managers and employees use an *existing* PMS in their communication, whereas *PM participation* is about how managers and employees work together to design and implement a new or modified PMS.

*Employee initiative* is somewhat comparable to the term “work-related motivation” that is more common in management accounting.<sup>1</sup> However, work related motivation is rarely measured directly and is often focused on a non-observable, internal state of mind (see Birnberg, Luft, & Shields, 2007, for an overview). For example, Hunton and Gibson (1999) examined the link between a construct similar to *PM participation* and work-related motivation. They measured motivation indirectly through “self-efficacy” and perceived “participation congruence.” We are interested not only in this internal state of mind, but also in employee *behavior*.

The basis of our model is the theory of planned behavior (TPB; Ajzen, 1991; Fishbein & Ajzen, 2010) that is widely used in psychological research to address how people can be motivated to behave in certain ways. It has to date not been used to explain or predict *employee initiative*, but we determined it would be fruitful given its effective use in a wide range of fields (Fishbein & Ajzen, 2010) including management accounting (e.g., Hill, Mann, & Wearing, 1996), organizational behavior (e.g., Dunn & Schweitzer, 2005), and change management (e.g., Jimmieson, Peach, & White, 2008). The TPB differentiates between motivational, social and cognitive variables. This classic distinction is also used in, for instance, Birnberg et al.’s (2007) overview of psychology theory in management accounting research. Most research so far—both inside and outside of management accounting—has included only one or two of these types of variables at the same time.<sup>2</sup> The present research contributes to the literature by including all three mediating behavioral variables

<sup>1</sup> Work-related motivation as used within management accounting is usually conceptualized as consisting of four processes: (1) “arousal”—the stimulation or initiation of energy to act; (2) “direction”—where energy or effort is directed; (3) “intensity”—the amount of effort expended per unit of time; and (4) “persistence”—the duration of time that effort is expended (Birnberg et al., 2007, p. 119).

<sup>2</sup> An exception is Erez and Arad (1986) who studied all three factors simultaneously. Their dependent variable was “performance,” and they found that a combination of the three types of variables was indeed the best predictor.





simultaneously and therefore giving a relatively complete explanation for the relation between *PM participation* and *employee initiative*.

The TPB distinguishes three antecedents of any particular kind of behavior: *attitude*—people’s evaluation regarding the behavior, *norm*—the extent to which people think that most people who are important to them, want them to behave in a particular way, and *control*—the extent to which people feel capable of performing the behavior (see Ajzen, 1991, for the complete theory). Because the terms “norm” and “control” have a different connotation for management accounting scholars, we will below use different equivalent terms that are more intuitive: *social pressure* and *capability* to take initiative, respectively.

According to the TPB, it is possible to change people’s behavior when an intervention is directed at one or more of its antecedents (Ajzen, 2006a). Therefore, we examine if *PM participation* influences *attitude*, *social pressure*, and *capability* to take initiative, and if all TPB relations hold with *employee initiative* as the dependent variable (see Figure 2.1).

### 2.2.1 PM participation and attitude to take initiative

In Hackman and Oldham’s (1976) “job characteristic model” the *attitude* to take initiative depends upon three psychological states: (1) experienced meaningfulness of the work, (2) experienced responsibility

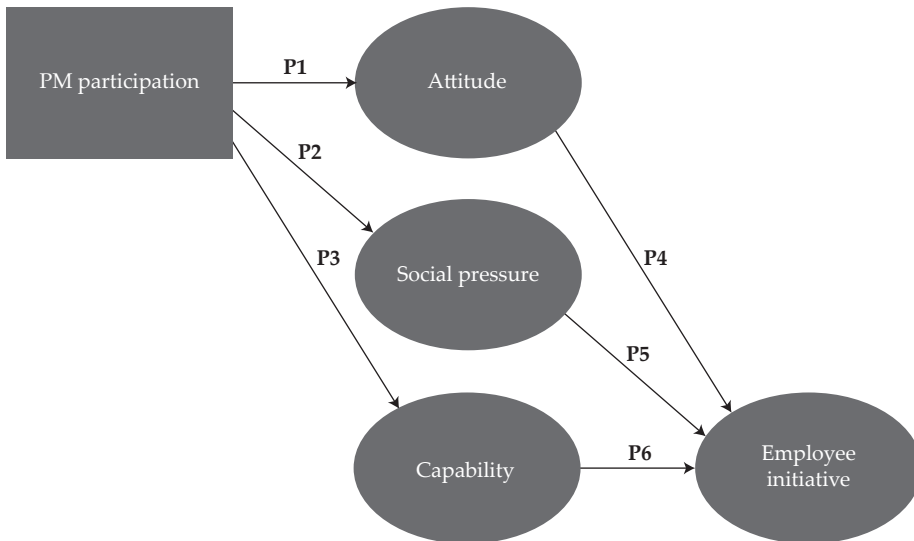


Figure 2.1 Proposed model of the study

for the outcomes of the work, and (3) knowledge of the results of the work activities (Fried & Ferris, 1987; Hackman & Oldham, 1976; Johns, Xie, & Fang, 1992). *PM participation* may invoke these psychological states and thus increase *attitude* to take initiative. The first state (experienced meaningfulness of the work) is invoked if *PM participation* gives rise to and reflects something employees believe in (Latham, 2003). In this case employees when trying to reach the goals do not have to sacrifice self-interest for the greater good (Bono & Judge, 2003). Hence they are likely to put more effort into reaching the goals (Sheldon & Elliot, 1998).

The second state (experienced responsibility for the outcomes of the work) is an inherent consequence of *PM participation* because it gives employees a certain amount of autonomy (Hackman & Oldham, 1976). When people have an influence on something, they often tend to become involved in making it work because they will perceive its success or failure as their own success or failure (Vroom, 1995, p. 267). In line with that kind of identification, *PM participation* makes them more positive about the developed performance measures (Abernethy & Bouwens, 2005; Wilderom et al., 2007). They will thus perceive the measures as a credible resource, which of course makes them more likely to accept their output (Ilgen, Fisher, & Taylor, 1979) and use them to improve their work (Luckett & Eggleton, 1991).

The third state (knowledge of the results of work activities) is likely to be affected by *PM participation* as well. Performance measures provide feedback, increasing the knowledge of the employees necessary to make decisions (Demski & Feltham, 1976; Sprinkle, 2003; Van Veen-Dirks, 2009). Since participatorily-developed performance measures have fewer measurement errors and better fit the needs of the employees (Abernethy & Bouwens, 2005; Cavalluzzo & Ittner, 2004), feedback is more likely to be accepted (Ilgen, et al., 1979; Luckett & Eggleton, 1991) and the employees' knowledge of the results of their work improves. In summary:

**Proposition 1.** *If employees participate in developing their own performance measures, their attitude to take initiative becomes more positive.*

### 2.2.2 PM participation and social pressure to take initiative

In addition to attitudinal gains, participation in developing the measures also seems to give social benefits, especially when speaking of group participation, as we do in this study (Erez and Arad, 1986). We think that *PM participation* leads to more *social pressure* because performance measures can prioritize behavior (Collins, 1982; Sprinkle, 2003) and clarify the requirements of someone's work role (Hall, 2008). They indicate where

employees should direct their effort, and the accompanying targets show how much effort they should put into it. After developing the performance measures together with their colleagues, employees are more likely to feel that they have to justify their performance, including the initiatives towards reaching the targets. Although these relations may also apply to non-participatory performance measures, it appears their influence is more prominent with self-developed performance measures. Acceptance of the measures is assumed to depend on the amount of influence someone has had on the selection and development of these measures (Lockett & Eggleton, 1991). A target should be accepted by the people concerned before it will have an effect on their behavior (Erez, Early, & Hulin, 1985). We therefore propose:

**Proposition 2.** *If employees participate in developing their own performance measures, they feel more social pressure to take initiative.*

### 2.2.3 PM participation and capability to take initiative

Building on the ideas of enabling formalization (Adler & Borys, 1996; Ahrens & Chapman, 2004), *PM participation* is found to lead to performance measures that are perceived as enabling or empowering (Chiles & Zorn, 1995; Hall, 2008; Quinn & Spreitzer, 1997; Spreitzer, 1995, 1996). Enabling performance measures are perceived by employees as facilitative for their work, rather than as just a monitoring device for managers, as performance measures are often seen (Wouters & Wilderom, 2008). There are two mechanisms that may explain why employees feel more capable to take initiative if they have developed their own performance measures. The first derives from the literature on the cognitive mechanisms that explain the relation between participation and performance (e.g. Shields & Shields, 1998). It is argued that an important feature of the participatory process is the discussion that takes place between the employees and their leader. Due to these discussions people know better what to do and how to do it, making the performance measures more useful (Kleingeld et al., 2004) and giving the employees more actual and perceived capability.

*PM participation* may also affect *capability* via the decision-facilitating role of these developed performance measures. Individuals' knowledge and ability to make better decisions can be improved by providing feedback (Sprinkle, 2003), and accurate performance measures are providers of such feedback (Demski & Feltham, 1976; Sprinkle, 2003; Van Veen-Dirks, 2009). It is generally accepted that *PM participation* leads to performance measures of better quality (Abernethy & Bouwens, 2005; Cavalluzzo & Ittner, 2004), a key factor often leading to more self-efficacy with regard

to reaching goals (Webb, 2004). Hence, we propose that *PM participation* makes employees more capable of taking initiative.

**Proposition 3.** *If employees participate in developing their own performance measures, their capability to take initiative increases.*

### 2.2.4 TPB antecedents and employee initiative

The theory of planned behavior advances the case that an individual's intention to perform a certain behavior depends on one's attitude, felt social pressure, and/or felt capability to perform the behavior; and that intentions are usually good predictors of behavior. Support for these relations is found in numerous studies and meta-analyses of diverse kinds of behavior (Fishbein & Ajzen, 2010). We foresee similar links with respect to *employee initiative* behavior and will below explain the rationale behind these propositions. We refer to Fishbein and Ajzen (2010) for the complete theory, and to the empirical papers that document relations that resemble those between *attitude* and *employee initiative* (Frese & Fay, 2001ab; Fuller Marler, & Hester, 2006; Parker, Williams, & Turner, 2006); *social pressure* and *employee initiative* (Crant, 2000; Frese & Fay, 2001ab); and *capability* and *employee initiative* (Axtell & Parker, 2003; Morrison, 2006; Parker et al., 1997, 2006; Spreitzer, 1995; Thomas & Velthouse, 1990).

The relation between *attitude* to take initiative and actually taking initiative is intuitively reasonable if you consider the definition of *employee initiative*: it is practically impossible to be self-starting, pro-active and persistent if you do not feel positive about taking the initiative. The relation between *social pressure* and *employee initiative* exists because people generally fear the negative consequence of being different (Brehm, Kassin, & Fein, 2002). Finally, even if employees want to take initiative and feel the social pressure to do so, they may not actually take initiative if they do not feel capable of it (Fishbein & Ajzen, 2010). Taking initiative "requires the expectation of being in control of the situation and of one's actions" (Frese & Fay, 2001a, pp. 155).

**Proposition 4a.** *Employees' attitude to take initiative is positively related to Employee initiative behavior.*

**Proposition 4b.** *Employees' felt social pressure towards taking initiative is positively related to Employee initiative behavior.*

**Proposition 4c.** *Employees' capability to take initiative is positively related to Employee initiative behavior.*

## 2.3 Method

### 2.3.1 Research design

This study is designed as action research, or more precisely as clinical field work (Baskerville & Wood-Harper, 1998), which means that the action researcher is involved with an organization in a helping role (Schein, 1987). The main action researcher worked three days a week on average at the site to do the clinical field work, and spent the other two weekdays at the university concentrating on the scientific part of the study. We chose action research because the research question concerns “understanding the process of change or improvement” (Coughlan & Brannick, 2001 as cited in Coughlan & Coughlan, 2002, p. 227). Our research design was chosen in order to optimize the opportunity to gain valuable insight into how an organizational phenomenon as *PM participation* actually works in practice (Coughlan & Coughlan, 2002). Designing and conducting research in real-world settings improves the exchange of knowledge between researchers and practitioners (Anderson, et al., 2001; Miller, et al., 1997; Rynes, et al., 2001; Van de Ven & Johnson, 2006), and if properly conducted can make accounting research more relevant in practice (Kasanen, Lukka, & Siitonen, 1993).

The intended contribution of this chapter is to extend the current body of management accounting knowledge concerning the question of why *PM participation* is related to *employee initiative*. We did this by means of systematic combining: continually going back and forth between theory and data (Dubois & Gadde, 2002). From the beginning the research question was clear and we intended to answer it by using a psychological theory. We gradually focussed on the theory of planned behavior because it includes motivational, social *and* cognitive type variables, all relevant to adequately explaining the link between employee participation and performance (cf. Jeong, 2006). Meanwhile, working in concrete, everyday contexts gave us a better feeling about what actually goes on when performance measures are being developed together with employees. This experience helped us to gradually see more and more connections between these observations and existing literature, which enabled us to extensively embed our observations in theory. Although the study was undertaken for purpose of theory development, we used the opportunity to do some theory testing as well. Our qualitative study suggested that all three TPB-variables seemed relevant to increasing *employee initiative*. Hence, at the tail end of the study we asked the employees to complete a questionnaire that would help us to examine whether some of these relations were also statistically significant.

We designed this study in ways that adhered to Baskerville and Wood-Harper's (1998, pp. 103-104) seven validity criteria for action research: "(1) The research should be set in a multivariate social situation. (2) The observations are recorded and analyzed in an interpretive frame. (3) There was researcher action that intervened in the research setting. (4) The method of data collection included participatory observation. (5) Changes in the social setting were studied. [...] (6) The immediate problem in the social setting must have been resolved during the research. (7) The research should illuminate a theoretical framework that explains how the actions led to the favorable outcome."

The first five criteria are met through our choice of the research setting that we will describe in Section 2.3.2. Most interesting and relevant here are Criterion 6 and 7. To meet Criterion 6 the intervention should actually lead to more *employee initiative*. If it fails to lead to more *employee initiative* then it is impossible to examine how and why employees took more initiative after the intervention, so it would make the research invalid. In Section 2.4 we show that employees indeed eventually did take more initiative. Moreover, Criterion 7 can be read as suggesting this study illuminates a theoretical framework that explains why our intervention led to more *employee initiative*. This of course is our main research question and what this chapter is all about. The developed theory is brought forward in Section 2.2, and in Section 2.4 we discuss how this model actually worked in the company in our case study.

In order to make our research replicable, we turn next to a very precise description of our methodology (see Checkland & Holwell, 2007). We start with a sketch of the research context that will help in the interpretation of the results. In Section 2.3.3 we describe each of the steps that we took to develop the performance measures together with the employees. In Section 2.3.4 we report how we captured the data and how we went about our analyses.

## 2.3.2 Research context

### 2.3.2.1 Organization

The organization under study is a medium-sized Dutch company in the beverage manufacturing industry. We focused on its maintenance department for the bottling lines. Figure 2.2 shows the relevant part of the organizational chart. The director of the supply chain department was a member of the board of directors. The supply chain department consisted of five sub-departments, one of which was the bottling sub-department. The head of bottling was part of the "supply team" which met at least

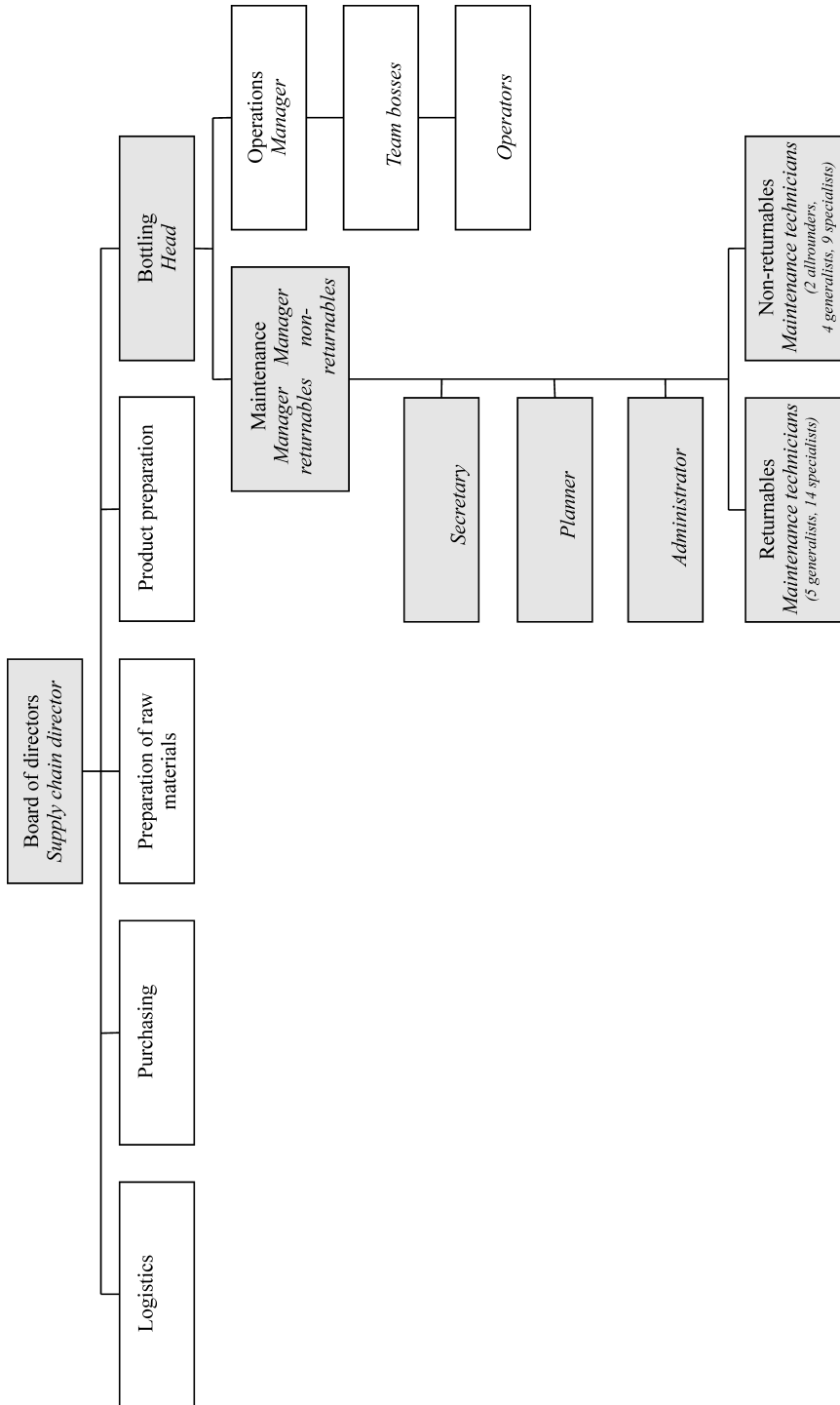


Figure 2.2 Part of the company's organization chart including the stakeholders of the study

monthly to discuss the broader picture of the supply chain department. The supply team consisted of the supply chain director, the head of supply chain control, and the heads of the sub-departments of supply.

The organizational chart changed slightly during our study, but the bottling sub-department was basically comprised of (a) the operators who were led by their own team bosses; and (b) the maintenance technicians who were led by two maintenance managers. Our study was situated among all the maintenance technicians and their managers. Of the 34 maintenance technicians, 16 were electro-technical and 18 were mechanical technicians. The remaining staff of the maintenance department included a planner, administrator, and secretary.

The bottling department has eight bottling lines. Each maintenance manager was responsible for four lines: one for lines that bottled using returnable materials, and the other for the lines using non-returnable materials. The processes of returnable and non-returnable materials differ because non-returnable materials are quality-checked before they enter the company, whereas returnable materials are not, which preempts directly comparing one-to-one the maintenance managers' performance. The maintenance technicians had an individual area of responsibility: 8 were responsible for one of the bottling lines, 24 for one kind of machine, and 2 were jack-of-all-trades and helped wherever and whenever they could.

Apart from the secretary all the employees of the maintenance department were male. The maintenance managers had both completed higher-level vocational education. One had been with the company for 28 years and had a departmental tenure of 20 years. The other, in contrast, had only recently joined the company at the beginning of our study. Four maintenance technicians had a lower-level and thirty had an intermediate vocational education background. The mean age of 33 of the 34 maintenance technicians was 45; their mean organizational tenure was 19 years. On average, they had spent 16 years working in this very same maintenance department.<sup>3</sup>

### 2.3.2.2 Changes over time

Besides our intervention, other relevant changes inside and outside the company were going on during our study. To put these changes into perspective, we refer to Figure 2.3 that gives an overview of the study's timeline. We already mentioned that a new maintenance manager entered

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<sup>3</sup>One of the participating maintenance technicians did not provide information on age and tenure



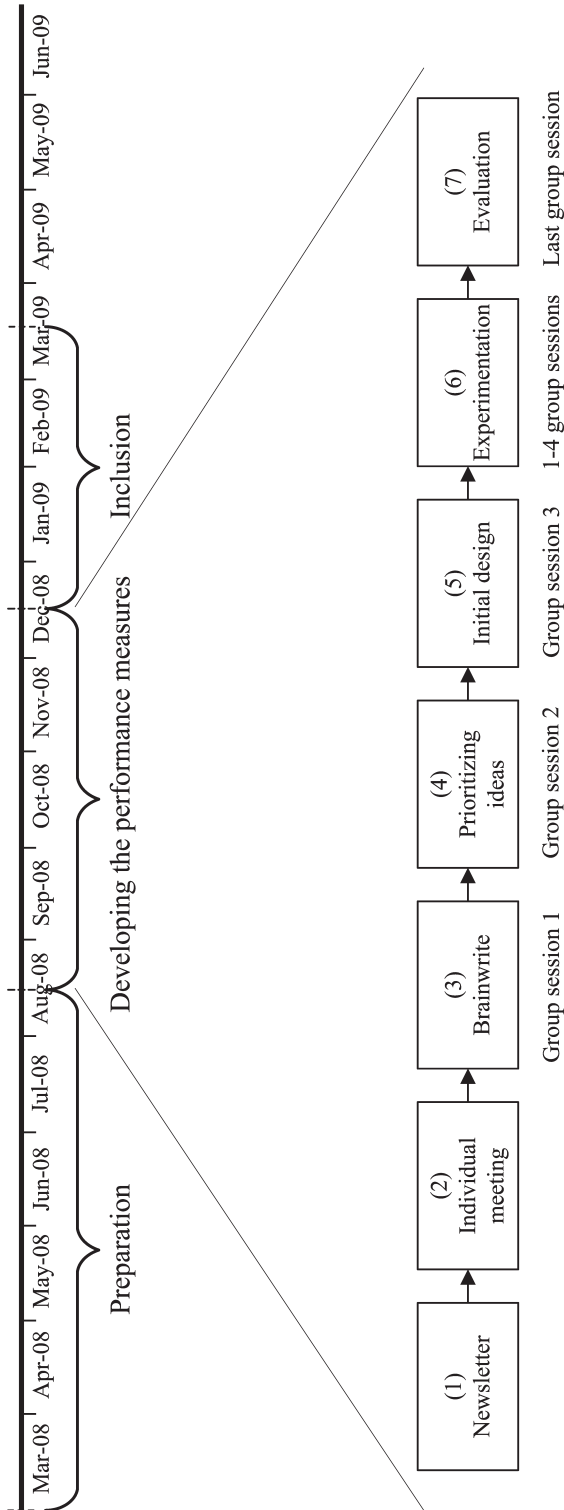


Figure 2.3 Timeline of the study

the company close to the beginning of the study. Moreover, in February 2008, the company was acquired by a larger, global, foreign based beverage manufacturing company. This new faraway owner had a decentralized structure in which the production locations work independently, and it seemed at the time the take-over would have no major consequences for the supply department. Nevertheless, in October 2008 a company-wide reorganization was announced and ten percent of all the employees would lose their jobs. Within the maintenance department, about 11 of the 39 positions would disappear. By the end of our study, three technicians had taken early retirement and two technicians and the secretary had been transferred to other departments.

### 2.3.3 Process

The actual process of developing the performance measures—illustrated in Figure 2.3—took four months. The rest of the sixteen months of the study were used to prepare this process, to include the developed performance measures in the departmental routines and to collect data.

#### 2.3.3.1 Preparation

The preparation consisted of several introductory meetings with several internal stakeholders. Moreover, four groups were formed. These groups were as diverse as possible, mixing the maintenance technicians from different lines and specializations. To make sure that the performance measures were explicitly in line with the goals of the organization, the head of bottling attached themes to the groups: (1) energy use, (2) material losses, (3) planned maintenance, and (4) machine failures. As part of the supply team, he had specific insights about the strategic priorities of the company and of the supply chain department. He wanted these four themes adopted because they were currently important for the bottling department in supporting the company's strategy. The rest of the supply team agreed with these themes.

#### 2.3.3.2 Developing the performance measures

Figure 2.3 summarizes the seven phases of the developmental process. It should be noted that in practice the transitions between the phases were more gradual than the schema suggests. Each phase can be briefly encapsulated as follows:

(1) Before the summer-break of 2008 a newsletter was e-mailed to all members of the maintenance department with information about the

purpose of performance measures and the process that was going to be used to develop them. The technicians were asked to attend an individual meeting with the action researcher after the summer-break. We emphasized in the original newsletter and afterwards that the measures were supposed to assist them (the technicians) in improving their own work, rather than being used by management to evaluate their performance.

(2) During the individual meetings, the maintenance technicians could (a) explain the current ways of working in the maintenance department, (b) articulate their expectations about the project, and (c) ask questions about it. The meetings were also conducted to collect interview data.

(3) Each group created performance measures in five to eight group sessions led by the main action researcher. During each group's first session one of the two maintenance managers explained the importance of the project and the technicians participated in a so-called brain-write (e.g., Terhürne, 2008; Thompson, 2003). Somewhat analogous to brainstorming, they were asked to individually write down as many improvement ideas as they could think of for the theme of their group. After ten minutes they handed their notes to their neighbors who used these to identify new or related ideas. This last step was repeated until everyone had received and elaborated upon the notes of everyone else. By beginning with improvement ideas rather than performance measures we had hoped to generate more efficient discussions and more commitment because: (a) it made the discussion immediately more concrete since improvement ideas are more tangible for the technicians than are performance measures, and (b) it showed the link between performance measures and taking initiative.

(4) The action researcher prior to each second group session categorized the improvement ideas and discussed them with the maintenance managers. During the second session the group prioritized and discussed them, selecting three areas within which they were going to develop performance measures.

(5) At the next session the action researcher helped the maintenance technicians to decide on the contents of the performance measures. She explained established criteria for making useable performance measures based on the Neely et al.'s (2002) performance measurement record sheet. This helped the maintenance technicians to specify the performance measures' purpose; relation to company goals; target; formula; data source; frequency of updating and discussing; and responsibility for updating, etc.

(6) The action researcher created a prototype of each performance measure before the subsequent session, and updated it before every next group session. The rationale for using prototypes was to have a more concrete discussion and make the measures as valid, reliable and understandable as possible (Wouters & Roijmans, 2010). The prototypes were based on information received during the sessions with the maintenance technicians and from others in the company, primarily those responsible for various information systems. The prototypes contained real data that were already being measured by the company's information systems.

(7) During the last group sessions, each group evaluated the developmental process and the results.

During the developmental process, the action researcher had regular meetings with the two maintenance managers where process and content issues were raised and addressed. Furthermore, with the same aim formal evaluation sessions took place before, during, and after the intervention with the maintenance managers, the head of bottling, and the head of supply chain control. The action researcher also kept the director of the supply chain department informed about the progress and results. These meetings helped the researchers to find solutions for context-specific problems during the process. Moreover, they enabled the managers to be alert about the progress of the process and be sure the technicians would work on strategically relevant performance measures. As it turned out none of these managers felt it was necessary to change the intervention process at any point in time.

### 2.3.3.3 Inclusion

All maintenance managers and technicians agreed to discuss the newly designed performance measures at least monthly during one of their daily line meetings. A daily line meeting is a half-hour morning meeting of the maintenance technicians that are present at the time, their manager, and the team boss of their bottling lines. At these meetings they discuss events of the past 24 hours, as well as other issues related to the work of the maintenance technicians. The researcher joined some of the daily line meetings in which the performance measures were discussed. During these meetings, she helped the maintenance technicians explain the measures to others who had not participated in the making of a specific measure. These early morning meetings afforded the researcher with an excellent opportunity to see how the measures were being used, and what initial effects they seemed to be having.

### 2.3.4 Data collection and analysis

We used multiple data sources for our analyses. We collected qualitative data from all the meetings, observations and semi-structured interviews and relevant quantitative performance data from the company's information systems. Moreover, the maintenance technicians completed a questionnaire after the performance measures were in use.

The level of analysis in this study was the individual. We were interested in the participatory development process that individual employees experienced, and the effect this had on the employee initiative behavior of individuals through *attitude*, *social pressure* and *capability*. These variables were all at the individual level (see our model in Figure 2.1). The process led to the development of aggregated departmental performance measures as well, but this is not part of our model.

#### 2.3.4.1 Meetings and observations

Most of our qualitative data was gathered at 190 meetings with 96 different company employees. These sessions lasted approximately 200 hours in total (see Table 2.1). The action researcher routinely took notes and made a report of each meeting, objectively noting date, starting time, duration, attending employees, attending researchers, the involved department, subject, reference to input for the meeting, reference to meeting notes, reference to company documents received, and type of contact (e.g., scheduled or ad hoc).

The notes were systematically coded in terms of "performance measurement," "attitude," "social pressure," "capability," "employee initiative," and "performance." In other words, all text relating to one or more of these constructs was highlighted and tagged with the name of the associated construct. Moreover, for each variable of interest the corresponding pieces of coded text were assembled in a separate listing.

#### 2.3.4.2 Interviews

34 of the 190 meetings were semi-structured individual interviews with the maintenance technicians about *attitude*, *social pressure*, and *capability* to take initiative. Each interview began with an introduction aimed at putting the respondents at ease, explaining the aim, content and estimated duration of the interview. The scientific goal of the data collection was stressed. The technicians were told a project would start later that month in which the action researcher would help them develop their own performance measures. They were told that the final purpose of the project was helping them take more initiative in improving the performance of

**Table 2.1** Specification of the meetings that the action researcher arranged and/or attended

Phase	Activity	Number of meetings	Total time (in hrs)	Number of different employees per meeting	Average number of employees per meeting
Preparation	Introduction	35	31	39	1.3
	Discussing project design and (preliminary) results	41	44	24	2.4
Intervention	Interviews with maintenance technicians	34	39	34	1.0
	Intervention sessions	27	33	32 <sup>a</sup>	4.0
	<i>Team: energy use</i>	6	6	8	4.4
	<i>Team: material losses</i>	8	9	8	4.3
	<i>Team: planned maintenance</i>	5	9	7	3.4
	<i>Team: machine failures</i>	8	10	9	3.9
	Seeking information for specific KPI's	28	18	22	1.3
Inclusion	Daily line meetings	7	4	26	5.7
Other	Other	18	29	all	many
	TOTAL	190	198	96	2.2

<sup>a</sup>The number of employees in the intervention sessions does not add up to 34, because one of the maintenance technicians was transferred to another department, and another one never showed up.

their department. The working definition of “initiative” was explained, and reminders of this definition were also given later in the interview.

Based on Ajzen’s (2006b) and Francis et al.’s (2004) manuals for constructing TPB questionnaires, *attitude*, *social pressure* and *capability* to take initiative were measured directly with these questions: “What is your opinion about taking more initiative?” “What would colleagues think of you if you were always the one that came up with improvement ideas?” and “Do you think you are able to take initiative?”



Furthermore, questions were asked about the behavioral, normative, and control beliefs of the maintenance technicians. The answers gave us more and richer information about the contextualized meaning and examples of *attitude*, *social pressure* and *capability* and gave us a qualitative basis for assessing whether *PM participation* had influence on *attitude*, *social pressure* and *capability*. We asked the technicians about (1) their views on the advantages and disadvantages of taking initiatives; (2) the groups or persons that are explicitly positive or negative when coming up with and implementing improvement ideas; and (3) the factors or conditions that hinder or facilitate the spotting and implementing of improvement ideas (see Ajzen, 2006b; Francis et al., 2004). The responses to these questions indicated that, for example, *attitude* depends on whether taking initiative is perceived as a natural part of the job, the enjoyment or fun experienced, earlier experiences with improvement initiatives, and the appreciation received for taking the initiative.

As advised by Strauss and Corbin (1990) we began the analyses of the interviews with “open coding” giving every statement of the maintenance technicians a label. Then we classified the labels under “attitude,” “social pressure” and “capability”. Subsequently we selected and combined the labels into the aspects listed in Table 2.2. We recoded the interview texts using “attitude,” “social pressure” and “capability” as codes so that we could assess if each respondent had given a response on each of those aspects, and if so whether it was positive, neutral or negative (see Table 2.2).

#### 2.3.4.3 Quantitative departmental performance data

It is important to stress here that all the performance measures taken in this study refer to departmental performance rather than the performance of any of the individual maintenance technicians. The technicians developed and implemented five performance measures: (1) rejection due to under-filling, (2) rejection of empty bottles, (3) use of water, (4) use of electricity, and (5) use of compressed air. The first two measures were developed by the group “material losses”, and the other three by the “energy use” group.<sup>4</sup>

<sup>4</sup>It was not possible to develop performance measures with the other groups (“planned maintenance” and “machine failures”) mainly because the IT-system was not capable of generating such measures, and higher management did not want to invest in adjusting the extant IT-system. This does not mean that these themes were irrelevant for top management. Managers repeatedly told us these themes were vital to the organization. They already had one employee working on defining the requirements of such an IT-system (for managerial purposes) before our project started. But that project was cancelled after the take-over when the company was not allowed to make such investment decisions in the remaining time of the study. We focused on the effects of those performance measures that were put into practice, rather than the ones that were not, to better understand why PM participation can lead to more Employee initiative. We refer to Bourne and colleagues (Bourne, 2005; Bourne et al., 2002) for more information about why some performance measurement initiatives succeed and others do not.

**Table 2.2** Results of the interviews

Variable Aspect	Response			
	Positive <sup>a</sup>	Neutral <sup>b</sup>	Negative <sup>c</sup>	No response <sup>d</sup>
Attitude	29	4	1	-
Part of the job	20	-	2	12
Fun	16	-	2	16
Experience	12	1	3	18
Appreciation	2	6	16	10
Social pressure	23	9	2	-
Maintenance technicians	9	5	3	17
Operators	18	2	2	12
Managers	14	-	-	20
The company	17	-	-	17
Capability	30	2	2	-
Knowlegde, skills, abilities	10	1	1	22
Opportunity	11	-	10	13
Facilitation by the manager	6	2	10	16
Time	5	1	18	10
Money	8	1	15	10
Communication and cooperation	11	5	14	4

<sup>a</sup>The numbers in this column indicate the number of maintenance technicians that mentioned that they perceived the variable/aspect concerned as being present

<sup>b</sup>The numbers in this column indicate the number of maintenance technicians that mentioned that they perceived the variable/aspect concerned as being not explicitly present or absent

<sup>c</sup>The numbers in this column indicate the number of maintenance technicians that mentioned that they perceived the variable/aspect concerned as being absent

<sup>d</sup>The numbers in this column indicate the number of maintenance technicians that did not mention the aspect





These performance measures are directly related to the company goals for the bottling department: “cost reduction,” “sustainability,” and “efficiency improvement,” as illustrated in Table 2.3. We use the results from the developed performance measures to assess the change in performance of the department. It was possible to reconstruct the measures for the period before the performance measures were developed (in the period June 2008 - May 2009) because the measures are based on information already present within the IT-systems of the company.

#### 2.3.4.4 Questionnaire

In June 2009, 25 maintenance technicians completed a questionnaire measuring *attitude*, *social pressure* and *capability* to take initiative, and *employee initiative* itself (see Appendix). To measure *employee initiative*, we used Frese and Fay's (2003, p. 14) often used and thoroughly validated items. We used a 7-point Likert scale with anchors “totally disagree–totally agree.” Earlier studies reported Cronbach's alphas of .80 (Frese, Fay, Hilburger, Leng & Tag, 1997) and .92 (Den Hartog & Belschak, 2007). In the present study Cronbach's alpha was .79.

*Attitude*, *social pressure* and *capability* to take initiative were each measured by four items (again using a 7-point Likert scale with anchors “totally

**Table 2.3** Contribution of the performance measures to the goals of the company

Company goal	Performance measure	Why?
Cost reduction	Rejection due to under-filling	Less loss of product
	Rejection of empty bottles	Less loss of bottles
	Energy use	Less costs of energy
Sustainability	Rejection due to under-filling	Less waste
	Rejection of empty bottles	Less waste
	Energy use	Less use of energy
Efficiency improvement	Rejection due to under-filling	Less rejection of products leads to a higher efficiency
	Rejection of empty bottles	Less rejection of bottles leads to a higher efficiency
	Use of water	Less water is wasted when the lines are functioning better

disagree–totally agree”) that were constructed following Francis et al. (2004). Cronbach’s alphas were .91 for *attitude* and .66 for *social pressure*, but only .20 for *capability* to take initiative. In hindsight, we concluded two items that measured *capability* did not really measure what we had intended. Deleting them increased Cronbach’s alpha to .36, which of course was still unacceptably low. Since there was no better alternative, we nevertheless used this scale. As a robustness check we also performed all analyses with the single item that best represents the *capability* construct (I am confident that I could think up and carry out improvement ideas by myself). In all other measures the scale scores were based on the average of the items.

## 2.4 Results

### 2.4.1 Results of the model

Propositions 1-3 are based on both qualitative and archival data. They state that *PM participation* affects the three TPB variables (*attitude*, *social pressure* and *capability* to take initiative). We investigated whether the maintenance technicians improved on these variables and on the developed performance measures. As a reference point, Table 2.4 gives index numbers of the production level of each line per month. Propositions 4a-c are examined based on the questionnaire data.

#### 2.4.1.1 PM participation and attitude to take initiative

**Attitude before**—At the outset of the study, several people in the company felt the maintenance technicians’ work attitudes would be quite negative, mainly because they had been subjected to several failed organizational changes in recent years. Amidst this skepticism, the manager of the bottling department was clearly perplexed in stating that “everyone has good intentions, but somehow improvement is not achieved.” These good intentions were confirmed in nearly all the interviews held before the performance measures were developed: 29 out of 34 technicians said they felt positive about taking an initiative, 4 were neither positive nor negative, and only 1 was negative about it (see Table 2.2).

We divided the technicians’ responses to the interview questions regarding *attitude* into four aspects: “part of the job,” “fun,” “experience” and “appreciation” (see Table 2.2). Many technicians during the interview noted they already considered improvement as part of their job, and some of them explicitly stated they liked it, or they had had earlier positive

**Table 2.4** Production June 2008-May 2009 (index number)<sup>a</sup>

Responsible manager	Product. line	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09
Returnable	1	100	56	73	64	58	52	67	28	69	60	76	60
	2	100	120	124	115	89	111	139	52	37	24	86	101
	3	100	75	76	104	58	50	78	95	81	96	105	108
	4	100	139	124	137	79	52	121	74	74	53	75	82
Non-returnable	5	100	100	25	33	30	126	37	20	34	15	26	111
	6	100	7	2	20	19	23	5	13	11	10	23	11
	7	100	136	53	70	65	47	102	43	59	75	61	101
	8	100	99	51	66	55	62	44	59	51	73	76	86

<sup>a</sup>This table makes it possible to compare the performance of the performance measures with the production level. For confidentiality reasons, we use index numbers instead of real production numbers. The production of June 2008 forms the base value. The numbers express the ratio of that month's production level to the base value.

**Table 2.5** Results of "rejection of under-filled bottles" (% in relation to production)

Responsible manager	Product. line	Months before measure was finished						Months after measure was finished					
		Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09
Returnable	2 <sup>a</sup>	0.2%	0.3%	0.2%	0.3%	0.2%	0.3%	0.4%	0.6%	0.6%	0.6%	0.5%	0.5%
	3	0.2%	0.2%	0.4%	0.2%	0.1%	0.2%	1.0%	0.3%	0.4%	0.3%	0.2%	0.2%
	4 <sup>a</sup>	0.7%	0.4%	0.5%	0.4%	0.6%	0.2%	0.2%	0.2%	0.2%	0.4%	0.2%	0.2%
Non-returnable	8	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%

<sup>a</sup>Significant change since implementation ( $p < 0.01$ ); line 2: T(7)=-4.89; line 4: T(7)=4.94.

experiences with improvement efforts. Nevertheless, at the same time many complained about the lack of appreciation they received from management. “We only hear from them when we have done something wrong” was a common sentiment. This was corroborated by the interim manager of the maintenance department who repeatedly said: “The motivation of the maintenance technicians to come forward with improvement ideas is decreasing more and more, because they never get feedback on the results of their ideas.” Thus, any improvement in employees’ *attitude* should be visible in the “appreciation” aspect.

*Attitude after*—In November 2008, when most of the performance measures had already been implemented, the maintenance managers mentioned: “The maintenance technicians now talk to each other about the performance measures and about what could be improved.” A month later one of the maintenance managers reported that the technicians were actually checking the results of each performance measure update. Moreover, during the daily line meetings, both the action researcher and the maintenance managers noted that the maintenance technicians now seemed to be focused more on improving than before. Example 1 shows the most prominent case of improved *attitude* during the development of the performance measures.

*Example 1—Rejection of under-filled bottles on bottling line 4.* In October 2008 the maintenance technicians reviewed the output from the first version of the performance measure “rejection of under-filled bottles” (see Table 2.5 for this performance measure’s data) in which all but one bottling line had a rejection percentage of about 0.2% or lower. Line 4 was the exception—it had a mean rejection percentage of about 0.5% ( $SD = 1.1 \cdot 10^{-3}$ ) from June through October. The technicians of that line were shocked and aimed to lower that percentage to 0.2%. They became eager to improve this percentage after seeing the current performance of the other lines, so the next month they revised their line. The mean rejection percentage was indeed on average 0.2% ( $SD = 0.9 \cdot 10^{-3}$ ) for the next seven months (November through to May), a statistically significant improvement ( $T(7) = 4.94$ ;  $p < .001$ ). In March 2009 the percentage rose, but this problem was quickly resolved without any interference by the maintenance managers.

In this example, the maintenance technicians found it obvious that putting effort into improving the percentage was worthwhile. In contrast, in the following example the technicians did not see the benefit—at least not initially. They needed additional information about the costs before they were willing to make improvement efforts.

*Example 2—Use of water and compressed air on all bottling lines.* The early versions of the performance measures regarding energy use did not

immediately lead to better results. When in December 2008 the energy costs in the bottling department were made explicit, and known to everyone, the maintenance technicians were very surprised to learn that the total energy costs of the department were equal to that of at least ten full time employees. The technicians thereafter commented that this financial aspect of the performance measure motivated them to improve. They stated they had simply not realized the scale of the benefit to be gained from improving that particular aspect of their work.

By February 2009 the use of water (see Table 2.6) improved. In the first eight months the realized performance was .5% better than the target ( $SD=6\%$ ). For the months February-May 2009 it was on average 18% ( $SD=6\%$ ) better than the target: a statistically significant improvement ( $T(6) = -4.69; p<.01$ ). This statically significant improvement did not extend to compressed air (see Table 2.7), primarily due to a defect in the bottling line machinery that resulted in a major negative result in April 2009 (-27% compared to the target). However, when we remove this outlier, there is a statistically significant improvement: in the first eight months they were on average .1% ( $SD = 5\%$ ) better than the target, and in February, March and May 2009 they were 14% ( $SD = 5\%$ ) better than the target ( $T(4) = -4.24; p<.01$ ).

In the evaluation sessions the maintenance technicians praised the fact that the newly developed performance measures allowed them to see how well they were doing their job. This gave them a feeling of appreciation, which was further reinforced when their managers also used the information from the performance measures to compliment them for their work. Before the performance measures were put into play such positive feedback had hardly ever been received. This indicates that the “appreciation” area of *attitude* had improved. In the section “attitude before,” we claimed that this area of *attitude* needed the most improvement. These changes in patterns of behavior support Proposition 1.

#### 2.4.1.2 PM participation and social pressure to take initiative

*PM participation* also increased *social pressure* to take initiative (Proposition 2). We will again examine this relation through the use of qualitative and archival data.

***Social pressure before***—In the initial interviews we asked the maintenance technicians what they thought colleagues would think of them were they themselves to come up with improvement ideas. Out of the 34, twenty-three of them thought their colleagues would react positively (see Table 2.2), and the others said that should some colleagues react negatively it would not stop them from consulting with colleagues. We asked the

maintenance technicians which groups or persons they thought would be *explicitly* positive or negative to the creation and the implementation of improvement ideas (as mentioned in Section 2.3.4.2). They mentioned other “maintenance engineers,” “line operators,” their “managers,” and “the company,” and they expected mostly positive responses (see Table 2.2). On the other hand, some could also think of negative responses from their fellow maintenance technicians and line operators: if the performance of the machines improves “too much” both line operators and maintenance technicians would have to fear for their jobs. Yet at the time of the interviews they had not thought this fear was realistic. In summary, most maintenance technicians felt that the social pressure was directed towards taking more initiative, some felt the social pressure was against taking more initiatives and some did not feel it at all. In other words, there was a broad mix of interpretations of colleagues’ opinions regarding taking more initiatives.

***Social pressure after***—Our qualitative data suggest that the performance measures made it explicit that improvement was expected. The performance measures provided the maintenance technicians with a target that was developed together with people who are important to them. Consequently, it was a manifestation of *social pressure*. This target was an explicit goal in Example 1 above. However, even when no explicit goal was set, we did find instances where the performance improved after the performance measures were discussed during the daily-line meeting. Example 3 illustrates this and together with Example 1 supports Proposition 2.

*Example 3—Use of compressed air on bottling line 5.* The performance measure “use of compressed air” (see Table 2.7) showed that bottling line 5 had used on average 10,556 Nm<sup>3</sup> (SD=962) compressed air per month over the previous seven months, despite rarely being in operation. When in December 2008 the maintenance manager and technicians discussed this at a daily line meeting they quickly concluded the strong discrepancy implied there were leakages. They all agreed they would try to find and repair them soon. Afterwards the amount of compressed air used by that line dropped significantly to an average of 5,518 Nm<sup>3</sup> (SD = 2,000) over the following five months ( $T(5) = 5.22; p < .01$ ).

#### 2.4.1.3 PM participation and capability to take initiative

Finally, we will discuss how *PM participation* helped to increase *capability* to take initiative (Proposition 3).

Table 2.6 Results of "use of water" (m<sup>3</sup>)

Responsible manager	Product. line <sup>a</sup>	Months before measure was finished												Months after measure was finished				
		Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	
Returnable	1	820	585	692	629	1260	1621	1240	468	1956	1649	1024	796					
	2	8804	9086	11629	11588	7460	7597	8064	5475	2628	3472	6727	4685					
	3	7069	5431	5904	7965	5332	3940	8917	7377	5088	5734	5919	6082					
	4	4746	6034	4935	4967	3176	2824	4116	3299	2668	1877	2455	2650					
Non-returnable	5	256	199	145	197	165	244	155	144	136	140	157	232					
	6	1131	314	384	331	235	159	142	86	84	91	134	88					
	7	3291	4126	1535	2452	2238	1734	2348	1661	1957	2729	2873	3511					
	8	5004	4500	2953	3049	2804	2606	1984	2197	2034	3468	3702	3856					
Total		31121	30275	28177	31178	22670	20725	26966	20707	16551	19160	22991	21900					
Target <sup>b</sup>		31645	31290	26212	28360	23259	22402	27865	21471	21346	23154	25448	28405					
Target-total <sup>c</sup>		2%	3%	-7%	-10%	3%	7%	3%	4%	22%	17%	10%	23%					
Target																		

<sup>a</sup>To give more information about where the water was used for, besides totals, the performance measures also showed the use of water per production line.

<sup>b</sup>Use of water is only partly dependent upon production. To make the performance measure more precise and informative, the target consisted of a fixed part and of a variable part that was based on the production level. The fixed and variable parts were determined with linear regression analyses on the use of water over all months with data available until Nov-08 (=Apr-Nov).

<sup>c</sup>Before the performance measure was finished, the total use of water was on average 0.5% (SD=6%) better than the target and after it was on average 18% (SD=6%) better than the target. A T-test shows this is a significant improvement ( $T(6)=-4.69; p<.01$ ).

**Table 2.7** Results of “use of compressed air” (Nm<sup>3</sup>)

Responsible manager	Product. line <sup>a</sup>	Months before measure was finished												Months after measure was finished				
		Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	
Returnable	1	214981	203748	200485	189455	192755	180442	183726	176161	163406	174011	425468	212364					
	2	54080	63756	88267	90289	75222	77718	84329	46184	22789	27060	52131	44772					
	3	52215	36983	36183	55203	43663	35691	61060	57422	38953	42519	47449	47927					
	4	196335	206435	181359	186971	139066	118490	214376	145273	135567	118769	131172	148103					
Non-returnable	5	10630	11324	9456	8969	10948	11399	11163	3187	4621	5906	5265	8609					
	6	n.a.	n.a.	12670	12269	7346	1626	912	816	772	742	1508	5930					
	7	45438	63186	25120	39689	38586	33353	55096	24572	31078	39770	34894	49144					
	8	1282	1313	645	923	768	869	609	820	580	906	1111	1264					
Total		574961	586745	554185	583768	508354	459588	611271	454435	397766	409683	698998	518113					
Target <sup>a</sup>		611462	606612	537258	566594	496939	485237	559837	472513	470810	495495	548716	567210					
Target-total <sup>b</sup>		6%	3%	-3%	-3%	-2%	5%	-9%	4%	16%	17%	-27%	9%					
Target																		

<sup>a</sup>To give more information about where the compressed air was used for, besides totals, the performance measures also showed the use of compressed air per production line.

<sup>b</sup>Use of compressed air is only partly dependent upon production. To make the performance measure more precise and informative, the target consisted of a fixed part and of a variable part that was based on the production level. The fixed and variable parts were determined with linear regression analyses on the use of compressed air over all months with data available until Nov-08 (=Jul-Nov).

<sup>c</sup>Before the performance measure was finished, the total use of compressed air was on average 0.1% (SD=5%) better than the target en after (leaving out the outlier of Apr-09 caused by a defect in line 1's meter) it was on average 14% (SD=5%) better than the target. A T-test shows this is a significant improvement  $T(4)=-4.24; p<.01$ .





**Capability before**—Most maintenance technicians said in the interviews that they felt capable of showing initiative in their work (30 of the 34, see Table 2.2). Triggered by the question “are there any factors or conditions that hinder or facilitate you in finding and implementing improvement ideas?” they discussed several aspects of their work regarding their *capability* to take initiative. We summarized them as: “knowledge, skills and ability,” “opportunity,” “facilitation by the manager,” “time,” “money,” and “communication and cooperation.” The performance measures were expected to influence all of these aspects.

Initially, the maintenance technicians’ “knowledge, skills and abilities” seemed to be operating satisfactorily (see Table 2.2). Many technicians said they usually had answers to the problems that arose in the bottling department, and if not they were generally confident *someone* would know a solution. According to the previous interim manager of the maintenance department the education and knowledge level of the maintenance technicians was good; and current maintenance managers said the technicians knew the bottlenecks in the lines better than anyone. Accordingly, many indicated that there of course was ample “opportunity” to improve (see next line in Table 2.2), also because they were of the opinion that a lot went wrong in the bottling department.

With regard to “facilitation by the manager,” the maintenance technicians noted that their managers did not take enough time to assess and approve their suggestions. They could thus not carry out all the possible improvements they had in mind, because they needed permission before trying to implement an improvement idea. In a similar vein some maintenance technicians found it difficult to convince the management to invest “time” and “money” (see Table 2.2) in projects resulting from their improvement ideas. The frustrated technicians coped with this inattention in different ways—some went to the head of the bottling-line, others to the maintenance managers, and others just ordered the materials they needed directly from the planner. This may explain why some technicians say there is enough time and money to implement their own improvement ideas, while others do not.

Maintenance technicians reported high levels of bureaucracy within the company, which made implementing improvement ideas difficult and time-consuming. Some technicians reported that they were often sent “from pillar to post,” and eventually stopped trying. Other technicians stated that they did not always tell their managers about the improvement ideas they are implementing. This is a typical problem with regard to “communication and cooperation.” In May 2008 the daily line meetings were introduced (see Section 2.3.3) which positively influenced the

information transfer between the technicians and their managers, and vice versa.

**Capability after**—One of the maintenance technicians of bottling line 4 stated that the performance measures' most important contribution was that the technicians could finally demonstrate to the management the importance of improving the filler station of the bottling line. Consequently their manager was more supportive, allowing them to spend more "time" and "money" which helped them to decrease the rejection percentage due to under-filling (see Example 1 above). Thus, the aspects (Table 2.2) "support of manager," "time" and "money" improved with the introduction of the performance measures.

"Communication and cooperation" improved somewhat with the introduction of the daily line meetings where both the maintenance manager and the maintenance technicians raised improvement ideas. Once the implementation of the performance measures began they started discussing improvement opportunities more routinely and in a structured manner, which further improved communication and cooperation in the maintenance department. Moreover, the development process itself led to more knowledge transfer between maintenance technicians. In the evaluation sessions, many technicians pointed with approval to the "discussions" during the sessions that "allowed them to learn from each other."

In general the process of developing performance measures gave the maintenance technicians more insight into their own improvement opportunities. Before they became involved in the development of their own performance measures, they were unaware so many improvements were possible. Although they knew a lot was going wrong in the maintenance department, they failed to accurately grasp what the problems were or how to solve them. The development process and the performance measures made them more competent to upgrade their overall performance. We see this change as supporting Proposition 3.

The next example, one in which the performance measures did not improve *capability*, may show that the *capability* to take initiative is a necessary condition for actually taking initiative.

*Example 4—Use of electricity on all bottling lines.* In Example 2 we saw that the maintenance technicians managed to increase the performance with regard to the use of water and compressed air. The same group of technicians developed the measure for the use of electricity (Table 2.8). However, during one of the first meetings, the maintenance technicians mentioned that they had no influence over the use of electricity. They said

Table 2.8 Results of "use of electricity" (MWh)

Responsible manager	Product. line <sup>a</sup>	Months before measure was finished												Months after measure was finished				
		Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	
Returnable	1	26.5	17.8	18.3	16.2	16.2	15.8	15.7	9.2	14.0	18.5	23.5	12.0					
	2	72.2	79.4	81.2	86.1	62.7	71.6	81.5	42.9	29.3	32.6	62.4	55.6					
	3	82.6	66.2	69.8	87.8	59.4	45.5	81.4	74.8	61.1	72.0	74.3	79.9					
	4	76.7	98.5	90.8	92.4	60.8	46.9	89.6	59.7	56.5	47.4	64.5	62.3					
Non-returnable	5	2.3	1.9	0.6	2.0	1.4	2.3	0.9	0.2	0.7	0.5	0.8	2.3					
	6	14.2	6.5	5.5	6.2	4.5	3.2	2.0	2.4	3.0	2.0	3.0	2.5					
	7	93.2	119.9	56.0	75.4	73.9	55.2	87.9	50.3	62.1	82.9	73.8	84.8					
	8	84.9	58.6	50.2	50.2	42.0	51.9	19.4	57.8	34.2	62.4	72.5	73.8					
Total		452.5	449.0	372.4	416.3	320.9	292.3	378.3	297.4	261.0	318.3	374.7	373.3					
Target <sup>b</sup>		459.8	453.8	367.4	403.9	317.2	302.6	395.5	286.8	284.7	315.4	381.7	404.7					
Target-total		2%	1%	-1%	-3%	-1%	3%	4%	-4%	8%	-1%	2%	8%					
Target																		

<sup>a</sup> To give more information about where the electricity was used for, besides totals, the performance measures also showed the use of electricity per production line.

<sup>b</sup> Use of electricity is only partly dependent upon production. To make the performance measure more precise and informative, the target consisted of a fixed part and of a variable part that was based on the production level. The fixed and variable parts were determined with linear regression analyses on the use of electricity over all months with data available until Nov-08 (=May-Nov).

**Table 2.9** Scale characteristics and correlations

	$\alpha$	mean	SD	N	1	2	3	4	5	6	7	8	9	10
1 Responsibility area <sup>a</sup>		1.76	0.44	25										
2 Discipline <sup>b</sup>		1.60	0.50	25	.11									
3 Manager <sup>c</sup>		1.40	0.50	25	.08	.00								
4 Organizational tenure		16.4	11.3	25	-.16	.41 *	-.48 **							
5 Departmental tenure		13.7	10.4	25	-.11	.20	-.47 **	.79 **						
6 Age		43.2	9.21	25	-.10	.36 *	-.28	.73 **	.70 **					
7 Education <sup>d</sup>		1.88	0.33	25	.08	-.30	.30	-.49 **	-.21	-.25				
8 Attitude	.91	6.07	0.81	25	-.21	.04	-.04	.00	-.02	.04	.16			
9 Social pressure	.66	4.89	0.95	24	-.25	-.07	.16	.07	.00	.06	-.25	.68 **		
10 Capability <sup>e</sup>	.36	5.24	0.89	25	.32	.27	.01	-.11	.04	.03	.10	.13	-.18	
11 Employee initiative	.79	5.64	0.62	24	-.11	.07	.09	-.07	.03	-.12	-.13	.58 **	.43 *	.38 *

\*p<.05 (one-tailed); \*\*p<.01 (one-tailed)

<sup>a</sup>1=responsible for one line; 2=responsible for one kind of machine

<sup>b</sup>1=electro-technical; 2=mechanical

<sup>c</sup>1=responsible for returnable; 2=responsible for non-returnable

<sup>d</sup>1=lower-level; 2=intermediate level

<sup>e</sup>Significance levels are the same if one *capability* item is used

that it was not up to them to implement all the electricity-use improvement ideas they had written down at the brain-write session. The intended performance measure had nevertheless been developed, but at the time the action researcher left the company the technicians were still unable to improve the situation.

#### 2.4.1.4 TPB antecedents and employee initiative

The questionnaire data provide the basis for examining Propositions 4a-c. Table 2.9 shows the correlations between all variables, including many demographic variables. The significant correlations found between all TPB variables and *employee initiative* seem to support P4a-c (P4a:  $r=.58$ ,  $p<.01$ ; P4b:  $r=.43$ ,  $p<.05$ ; P4c:  $r=.38$ ,  $p<.05^5$ ). Moreover, we find a significant correlation between *attitude* and *social pressure* to take initiative ( $r=.68$ ,  $p<.01$ ). Table 2.10 shows the results of the regression analysis used to determine which variables contribute most to the variance in *employee initiative*. Since we neither found any correlations between any of the

**Table 2.10** Results of the regression analysis predicting *employee initiative*

Variable	B	SEB	$\beta$
(Constant)	11.86		
Attitude	0.49	0.32	.36
Social pressure	0.29	0.27	.26
Capability <sup>a</sup>	0.91	0.42	.38*

$R^2=.46$ ;  $N=24$

\*  $p<.05$

<sup>a</sup>Significance levels are the same if one *capability* item is used

demographic variables and any of the variables of the model, nor had a theoretical reason to expect such a relation, demographic variables should not be included in the regression specifications (Becker, 2005). The link between *capability* and *employee initiative* is the only factor that remains significant when all the variables are analyzed at the same time.

#### 2.4.2. Influence of PM participation

In sections 2.4.1.1-2.4.1.3 we have shown that the *attitude*, *social pressure* and *capability* to take initiative all increased after the departmental performance measures were implemented. A key question is: was the

<sup>5</sup>When *capability* is only measured with the item that best represents the construct (*I am confident that I could think up and carry out improvement ideas by myself*), the significance levels are the same in both the correlation and regression analyses.

participatory nature of the intervention process important for this result, or would top-down development of the performance measures have generated the same desirable effects? The following example indicates that indeed participation did matter. It shows that the maintenance technicians—who were involved in the development process—took action when the performance in the measures decreased; whereas the responsible maintenance manager—who was not directly involved in the development process—did not take any action because he did not believe the numbers.

*Example 5—Rejection of under-filled bottles on bottling lines 2 and 3.* When the performance measure “rejection of under-filled bottles” (Table 2.5) was made, the maintenance technicians of bottling lines 2 and 3 were convinced that their rejection percentage due to under-filling was already satisfactory. Yet about one month later, following changes made to bottling lines 2 and 3, the rejection percentages of these two lines began rising. Bottling line 2’s percentage rose because the line began to be used for small batches only, and batch changes are always followed by under-filling. The maintenance technicians were familiar with this and believed they were thus unable to reach the target again. Regarding bottling line 3, the maintenance technicians took action after recognizing the decreased performance on the measure was stable, leading them to believe the target could only be reached again if they themselves improved the bottling line. Just before the performance was satisfactory again, in March 2009, the responsible maintenance manager—who had not attended the sessions—saw the decreased performance on the measures. He stated he did not believe those statistics because he was (falsely) convinced that it was impossible to perform badly on under-filling and be satisfactory in terms of line efficiency at the same time. Participation in the development of the performance measure on under-filling seems to explain why the technicians felt they should improve, while the manager did not.

We have another indication that *PM participation* worked well in this setting. Initially, when we told some maintenance technicians that we were going to develop performance indicators together with them, they reacted negatively. Examples of their reactions are: “That is impossible for such a complicated process” and “I don’t think we should be evaluated.” The action researcher said that she would actively help them and that the resulting performance measures would only be used to facilitate them in their jobs. The maintenance manager who was present endorsed this process. Contrary to their earlier negative reactions, in the evaluation sessions after the performance measures were developed, these same technicians were now convinced of the value of using performance measures. They had come around to the idea the measures really showed

**Table 2.11** Results of the regression analysis predicting *employee initiative*

	Process	Result
Good as it was	Starting with improvement ideas	Many improvement ideas
	The diversity of the group	We formulated goals
	Stimulating discussion	More insight into costs
	The structure of the sessions	More insight into effects of our work
	"Prototyping"	We are more critical of our work
	Enthusiasm of the action researcher	Insight in advantages of performance measures
Could be improved	Attendance percentage	We are afraid the positive results will
	It is very time consuming	fade away
	The time between sessions was too long	
	Our managers should motivate us more	
	Many ideas are outside of our influence	

how they performed and these positive results were a consequence of the specific process that was used. They especially liked the fact that the process was begun with them thinking of improvement ideas, because that made the performance indicators more prospectively relevant to them. Table 2.11 shows these and the other reactions during the evaluation sessions.

Although they were disappointed about not being able to realize their ideas, the maintenance technicians that were not allowed to implement their performance indicators were positive about the process. They said the process had helped them to understand what performance measures are and how to use them. Moreover, they valued the fact they were finally able to speak constructively to their colleagues in other parts of the department. Moreover, they were excited about the large number of improvement ideas that came up during the brain-write sessions.

### 2.4.3 Quality of the measures

We think that the positive influence of *PM participation* on the behavior of employees partly occurred because involving employees leads to better quality performance measures. In terms of Moers (2006), quality consists of precision, sensitivity and verifiability of performance measures, which were all positively influenced by the participatory development process. Verifiability increased because the performance measures were based on sources that were identified by the maintenance technicians, so they knew exactly where the numbers originated. Moreover, discussions

of prototypes sometimes led to better precision and sensitivity in the performance measures (see Example 6).

*Example 6—Use of electricity prototypes.* The first version of the performance measure “use of electricity” was developed by the action researcher. It was based on the maintenance technicians’ initial answers to the performance measurement record sheet, and conversations with a staff employee of the bottling department well versed in the information system that stores information about the use of electricity in the bottling department. The first prototype included every kind of electricity use the information system contained pertaining to the bottling department. When the prototype was discussed with the maintenance technicians at the next session they indicated that many of these identified electricity usage points were actually not part of the bottling department. These usage points were thus eliminated from the next prototype in order to make the measures more precise. Moreover, the maintenance technicians wanted to exclude the battery charging station of the fork-lift trucks, because this used a constant amount of electricity throughout all of the previous months. This narrowing of the energy use performance measure also increased the sensitivity of this measure.

Another way in which the quality of the performance measures increased is detailed in Example 7.

*Example 7—Use of water on bottling line 1.* In the first week of December 2008, the maintenance technicians discussed the performance measures at a daily line meeting. They noticed the measures showed that the use of water on bottling line 1 had recently increased a lot. The person responsible for that line explained that this was due to a problem with the flow meter. Before the performance measures were developed, he would just have tolerated it and waited until someone from another department (responsible for the meters) made the discovery and took action to resolve it. Now, however, he took the initiative himself to have that department solve the problem quickly. Overcoming this faulty metering immediately increased the validity of the measurement data. The management also used this data for their own performance measures. Hence not only the quality of the maintenance technicians’ performance measures improved, but also the quality of the performance measures of the managers.

#### **2.4.4 Alternative explanations**

Section 2.3.2.2 showed that the maintenance department faced some significant changes at the time of the development of the performance measures. These changes may have influenced the attitude of the



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maintenance technicians, and thus provided an alternative explanation for our findings. First of all, the company was being reorganized with the expectation of lay-offs, resulting in insecurity among the maintenance technicians. When the maintenance technicians were filling in the questionnaire, many cynically remarked that we had arrived with “perfect timing.” Asking them for clarification often resulted in a response like: “Because of the current reorganization, everybody is very negative.” Yet in order to avoid losing their jobs the reorganization may have triggered the maintenance technicians to work harder. While losing their jobs based on their performance was not very likely,<sup>6</sup> the upcoming lay-offs in the maintenance department may have given some workers a sense of urgency about the need to improve. Indeed, the next example shows that some of the registered improvements were anomalous—they could not be explained by an increase in improvement initiatives after the performance measures were developed.

*Example 8—Rejection of empty bottles on bottling lines 2 and 4.* After the performance measures were introduced three of four bottling lines showed a small but statistically significant ( $p < .05$ ) improvement in the empty bottle rejection rate (Table 2.12). Yet the action researcher who often attended daily line meetings never observed any discussions between the maintenance technicians about this performance aspect, nor any overt attempt to improve the reported performance. So besides a possible contagion effect, there was no evidence whatsoever the developed performance measures had anything to do with that improvement. Hence there may have been another force—such as the reorganization—that caused this effect. However, the performance improvement in the other examples—that supported our propositions—is much higher than the improvement shown in Example 8. In other words, the best inference to draw is that the improvement initiatives after the performance measures were developed probably had an incremental effect on the performance, more than any other factor. Therefore, in general it is reasonable to contend that the employees’ involvement in and influence on the development of the performance measures played a key part in the realized improvements.

Another important change was the recent replacement of one of the two maintenance managers, as mentioned in Section 2.3. While it is difficult to compare their performance because the lines they supervised were so different, we did see performance improvements in the lines of both managers. Thus, it does not seem likely that differences between these managers provide alternative explanations for the reported results.

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<sup>6</sup> In accordance with Dutch labor-law regulations, the selection of which maintenance technicians were to lose their jobs was based on criteria of age and tenure (last-in, first-out per age group), rather than performance.

**Table 2.12** Results of “rejection of empty bottles” (% in relation to production)

Responsible manager	Product. line	Months before measure was finished						Months after measure was finished					
		Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09
Returnable	2 <sup>a</sup> <sup>ab</sup>	1.2%	1.1%	1.3%	1.9%	1.7%	1.1%	1.1%	0.8%	0.7%	-	1.0%	1.1%
	2 <sup>b</sup> <sup>a</sup>	2.5%	2.6%	1.5%	1.7%	3.5%	1.4%	1.4%	1.2%	1.2%	1.5%	1.4%	-
3	3	1.0%	0.8%	0.8%	1.4%	1.6%	1.4%	1.1%	1.0%	0.8%	1.1%	1.0%	1.2%
	4 <sup>a</sup>	3.2%	3.3%	3.7%	3.6%	3.1%	2.6%	3.4%	2.5%	2.9%	2.7%	2.8%	2.0%

<sup>a</sup>The T-test shows a significant improvement since implementation ( $p < 0.05$ ); line 2a:  $T(8) = 2.76$ ; line 2b:  $T(5) = -2.40$ ; line 4:  $T(10) = 2.10$ .  
<sup>b</sup>Line 2 uses two kinds of bottles (indicated by “2a” and “2b”) that differ a lot on this measure. The maintenance technicians found it more useful to measure them separately.

Finally, our entire “package” of the intervention to develop performance measures in a participatory way will have contributed to an increase in *employee initiative*, rather than only “participation.” For example, the simple fact that the employees were told from the beginning they would be expected to take more initiative may have explained the increase in initiative. However, this was an important step in the intervention process and it is consistent with TPB being transparent and explicit about the intended behavioral change of participants. This entire project was not an experiment wherein the objectives should be kept secret from the subjects. To the contrary, we think telling the objective was an important element of the approach taken for participatively developing performance measures—albeit not sufficient. Perhaps *social pressure* towards taking initiative increased a bit, because it made the technicians start to recognize what was expected of them. But it is unlikely that it would have an influence on *attitude* and *capability*. Since *capability* seems to be a necessary condition to increase *employee initiative* (see Section 2.4.1.3), we think more was needed than just communicating the purpose of the project.

Another possible alternative explanation for the increase in *employee initiative* with regard to the development process that was used is the fact the process started with thinking of improvement ideas before the performance measures were even developed. Again, this was helpful for reaching the goals and a deliberate part of the participative approach for developing performance measures, but not sufficient. We only saw attempts to actually improve after the performance measures were in use, but not immediately after the brain write sessions in which the technicians had to write down as many improvement ideas as possible. If those early meetings in September 2008 had indeed led to more *employee initiative*, we would have detected improvements in departmental performance by October or at least November. However, the evidence in Tables 4-7 and 11 tells a different story—the first improvements were realized only right after the measures were put to use.

## 2.5 Discussion

In this study, we developed a model that explains why *PM participation* influences *employee initiative*. We provided empirical support for the propositions. Our main findings showed that the performance measures developed in a participatory fashion can improve: (1) *attitude*—due to feedback on the outcomes of improvement initiatives; (2) *social pressure*—because it provided the maintenance technicians with shared priorities

and targets; and (3) *capability*—because the performance measures uncovered various improvement opportunities. These variables in turn positively influenced *employee initiative*. Questionnaire results show that all three—*attitude*, *social pressure*, and *capability*—significantly correlate with *employee initiative*. However, only the relation with *capability* remains significant when all the variables are analyzed at the same time.

We found no support for alternative explanations, and we found one unexpected strong relation, namely a correlation between *attitude* and *social pressure* to take initiative. This supports a slightly different representation of our model wherein *social pressure* indirectly leads to *employee initiative* via *attitude* to take initiative (cf. Chang, 1998; Vallerand, Deshaies, Currier, Pelletier, & Mongeau, 1992). Chang's (1998) explanation for this is that people base their attitude towards performing a certain behavior on how others who are important to them consider the behavior. Our qualitative results provide some suggestive support for this interpretation: in the examples we saw that the *attitude* to take initiative was mainly influenced by the feedback the employees received from the performance measures that they had developed together with peers and managers, which are both manifestations of *social pressure*.

Describing how operational employees were involved in the process of developing performance measures is a further contribution of this research, because this bottom-up approach has received little attention in the accounting literature so far (Otley, 1999; Abernethy & Bouwens, 2005). Importantly, we made it clear from the beginning that the performance measures were intended to help the employees taking the initiative to improve the performance of their department, and not as a control device for management. To make sure that the performance measures were in line with the goals of the organization, the technicians were divided into four groups. The process began by soliciting operational improvement ideas during the groups' meetings, using a so-called brain-write. Performance measures were then developed iteratively at several subsequent group sessions. In many of these meetings prototype versions which were based on actual data were discussed (Wouters & Roijmans, 2010). The process was facilitated in a *nuanced* way. The main action researcher presented herself as a process facilitator who would help the employees to get their own ideas to work and thus increase productivity, instead of as an expert who introduces contextually ambiguous new ideas. She sought to maintain a careful balance between listening and proposing new measurement ideas. She had a broad knowledge of the performance measurement literature and previous performance measurement projects, and she was familiar with complex information systems. She used this expertise to not only assure their engagement for this work; she had a far more demanding

job—asked countless questions and follow-ups; building collaborative prototypes; asking for continual feedback and resolutions; bringing fresh ideas to the table; and challenging constructively extant ideas, etc.

Since the action researcher plays a key role within the process of developing the performance measures, a relevant question is if the results are driven by the researcher instead of the development process: Would the results have been the same had another action researcher directed the actions, or would the same researcher have achieved the same results in other ways? In Section 2.3.3 we tried to be very clear about the intervention in order to make it replicable. In fact, a very similar intervention has been conducted among the employees of a public sector call center by another action-researcher (Gravesteyn, et al. 2011; Groen, Evers, et al., 2011). In that study it was found that employees also showed more *employee initiative*, resulting in many small performance improvements. In both projects the facilitative project-management role of the action researcher as well as the new participatively built performance measures seemed essential. We cannot conclude definitively whether the same researcher would have achieved the same results in other ways, but we do believe that such would be very unlikely.

Developing performance measures together with the maintenance technicians had a positive effect on their *attitude*, *social pressure*, and *capability* to take initiative, which in turn affected their behavior regarding taking more initiatives for performance improvement. To affect behavior on a continuing basis, *attitude*, *social pressure* and *capability* should be kept at the same level as after the intervention, until the new behavior becomes habitual (Ajzen, 1991). Our model does not extend to that longer-term aim. We only explain and observe behavior in direct relationship to the intervention aimed at changing the behavior in the near term; sustaining the desired behavior is another critically important issue but is not within the scope of this study.

Since we found a positive effect of an intervention on the behavior of employees, a comparison with the Hawthorne studies is relevant. These studies showed a change in employee behavior after the employees participated in an intervention that could not be explained by the intervention itself. This is often termed “the Hawthorne effect.” In hindsight the behavioral changes in these classical studies were explained in several ways, such as due to changes in employees’ attitude, interpersonal relationships, acquiring skill, awareness of being under study, continuous feedback, or supervision (Wickström & Bendix, 2000). We explicitly addressed similar effects in the present study. The first three alternative explanations for the Hawthorne studies’ results are included

in our model in the form of *attitude*, *social pressure*, and *capability*. We do not know whether awareness of being under study played a part in the results, but we do know that influence of continuous feedback and supervision was present in this study. These were part of our intervention and necessary to develop useful performance measures together with the employees, and to eventually get the positive changes in behavior. However, as similarly discussed in Section 2.4.4, just conditions of being under study and continuous feedback and supervision do not explain why improvements were only found immediately after the performance measures were in use. This supports our conclusion that participatorily-developed performance measures may positively affect *employee initiative*.

Limitations of our research design are that the results are built on only one company, and that we do not know if all the relations hold were they analyzed together in one model. In addition, since we only developed the performance measures in a participative way, it was not possible to compare it to a situation in which performance measures were made without the participation of employees. It would be desirable to conduct a large-scale, cross-sectional quantitative study, testing the whole model with varying degrees of participation. Furthermore, inasmuch as action research is inherently an iterative and selective process of theory development and data gathering, researcher bias may play a role (Maxwell, 2005).

Given these caveats, the fact remains that the strength of this research method is that it allowed the gathering of triangulated data, including the observing of the processes first-hand. From the start, we were challenged to demonstrate that company-university cooperation could lead to innovative results that could be implemented straightaway and be of practical relevance to the company. The employees were surprisingly cooperative and helpful in trying to make their work more measureable. There was a remarkable change from “this won’t work in our situation” to “now we know what performance measures can do for us.” We found that positive effects were brought about despite—or maybe because of—the fact that performance measures were not used for formal evaluations by management. The employees became quickly engaged and expected that spending time with the researchers would be worthwhile *for them*. It was extraordinarily interactive, the complete opposite from the commonplace top-down linear process where the researchers design frameworks and the company implements them. Our journey of collaborative discovery (Van de Ven & Johnson, 2006) helped to better understand how employees can together develop their own departmental performance measures, and why this may lead them to take useful initiatives for operational performance improvement.

## Appendix 2A. Measurement instruments

Answering format for all items in the questionnaire:

1. totally disagree – 7. totally agree

### Items “attitude to take initiative”

1. Thinking up and carrying out improvement ideas by myself is pleasant
2. Thinking up and carrying out improvement ideas by myself is useful
3. Thinking up and carrying out improvement ideas by myself is positive
4. Thinking up and carrying out improvement ideas by myself is good

### Items “social pressure to take initiative”

Most people within <<the company>> who are important to me...

1. ...expect of me to think up and carry out improvement ideas by myself
2. ...want me to think up and carry out improvement ideas by myself
3. ...think that I should think up and carry out improvement ideas by myself
4. I feel social pressure to think up and carry out improvement ideas by myself

### Items “capability to take initiative”

1. I am confident that I could think up and carry out improvement ideas by myself
2. It is easy for me to think up and carry out improvement ideas by myself
3. There are factors that make it difficult for me to think up and carry out improvement ideas by myself (recoded and deleted)
4. It is possible for me to think up and carry out improvement ideas by myself (deleted)

### Items “employee initiative”

1. I actively attack problems
2. Whenever something goes wrong, I search for a solution immediately
3. Whenever there is a chance to get actively involved, I take it
4. I take initiative immediately even when others don't
5. I use opportunities quickly in order to attain my goals
6. Usually I do more than I am asked to do
7. I am particularly good at realizing ideas

# CHAPTER 3

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## **Increasing employee job performance through employee participation in the development of performance measures: On the role of PM quality and perceived control to perform**

This chapter has been presented at the European Academy of Management conference 2012 and at Eindhoven University of Technology. A previous version has been presented at the European Association of Work and Organizational Psychology 2011 conference.





# CHAPTER 3

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## ABSTRACT

Combining the theory of planned behavior with recent performance measurement insights this study examines how employee participation in the development of performance measures may lead to better job performance. We hypothesize that when employees have had a say in the development of their own performance measures they perceive these measures to be of higher quality. Employees' perception of PM quality is expected to be related to employees' attitude, perceived social norms, and perceived control to perform well at their job and these variables are, in turn, hypothesized to be positively related to their job performance. Survey data of 95 employees and 88 of their managers were analyzed using structural equation modeling. PM participation appears to be linked to employee job performance via PM quality and perceived control to perform. We discuss the practical and theoretical implications of these findings, including the limitations of the study's design and considerations for future research in this area.

## 3.1 Introduction

Employee participation research is being conducted within various separate areas (such as goal setting, budgeting, decision making, change management and information systems). As is shown in several meta-analyses there are many positive effects of participation (Cotton, Vollrath, Froggatt, Lengnick-Hall, & Jennings, 1988; Derfuss, 2009; He & King, 2008; Miller & Monge, 1986; Rodgers & Hunter, 1991; Wagner, 1994; Wagner & Gooding, 1987b; Wagner, Leana, Locke, & Schweiger, 1997). Employee performance and satisfaction have been studied the most as desirable consequences of participation. (Hunton & Price, 1994)

When wanting to learn more about when and why participation leads to positive effects it is important to be specific about the type of participation studied (Jeong, 2006). For example, early organizational behavior research on participation focused on participation in goal setting (see Kleingeld, Mierlo, & Arends, 2011; Latham, Erez, & Locke, 1988; Tubbs, 1986). Around the beginning of the new millennium, the research on participation in goal setting branched out into participation in designing performance measures (e.g. Chapter 2; Abernethy & Bouwens, 2005; De Haas & Algera, 2002; Hunton & Gibson, 1999; Kleingeld, Van Tuijl, & Algera, 2004; Li & Tang, 2009; Wouters & Wilderom, 2008). Hereafter, we will call this form of participation “PM participation.” This is the specific kind of participation context we will look at in this study.

With performance measures we mean everything used to quantify employee job performance, including both individual and group measures, such as for instance: client satisfaction, efficiency, amount of work done in a certain amount of time, and quality indicators. We define *PM participation* as the extent of influence employees feel they have had on the design of the performance measures they are measured by (Abernethy & Bouwens, 2005)<sup>1</sup>. Goal or target setting is part of *PM participation*, but *PM participation* may also include co-developing the other aspects of performance measures distinguished by Neely et al. (Neely, Bourne, Mills, Platts, & Richards, 2002; Neely, Richards, Mills, Platts, & Bourne, 1997): the name; the purpose; the calculation formula; the frequency of measuring; the source of data; and the responsibility. Moreover, *PM participation* regards influence of employees in the making of performance measures during all the developmental phases: design, implementation, and maintenance (cf. Bourne, Mills, Wilcox, Neely, & Platts, 2000).

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<sup>1</sup> Thus we are talking about influence (or: choice) and not only involvement (or: voice). Both are essential components of participation (Hunton & Price, 1994; Jeong, 2006).

Kleingeld, Van Tuijl and Algera (2004) introduced this broader form of participation in the field of organizational behavior with a semi-experimental study which showed that co-developing performance measures with employees has a larger positive effect on employee job performance than implementing performance measures with a tell-and-sell strategy or not using performance measures at all. Such positive performance effects of *PM participation* have been found in other studies as well, in particular in management accounting and information systems literature (e.g. Abernethy & Bouwens, 2005; Hunton & Gibson, 1999). These studies assume employee behavior to explain the results, but they do not empirically investigate this. For example Kleingeld et al. (2004, pp. 832-833) assumed that co-developing performance measures has a positive effect on job performance because it produces “cognitive benefits (e.g., better understanding of job priorities, development of effective task strategies) and motivation gains (e.g., commitment to the system, acceptance of feedback and goals).” Literature on participation in general mentions similar arguments (Latham, Winters, & Locke, 1994; Wagner, et al., 1997), and includes social effects (Erez & Arad, 1986; Jeong, 2006). Also, Jeong (2006) notes that if one wants to explain the mechanisms between co-developing performance measures and *employee job performance* one should include all three factors: cognitive, motivational and social ones. These three types of factors have also often surfaced in research to explain the relation between performance measurement in general and performance (e.g. Birnberg, Luft, & Shields, 2007; Burney, Henle, & Widener, 2009; Collins, 1982; Gruman & Saks, 2011; Hall, 2008; Ilgen, Fisher, & Taylor, 1979; Luckett & Eggleton, 1991; Webb, 2004). Combinations of the three factors have been found to predict performance best (Erez & Arad, 1986).

The previous assumptions for why co-developing performance measures with employees may lead to better employee job performance have not yet been empirically tested. The main contribution of the current study is empirically examining how *PM participation* and *employee job performance* are linked. This will give more insight into how co-developing performance measures with employees may lead to better employee job performance. We define *employee job performance* as the extent to which employees meet their job requirements according to their manager (Podsakoff & Mackenzie, 1989).

We use the theory of planned behavior (Ajzen, 1991; recently re-introduced as the “reasoned action model” by Fishbein and Ajzen, 2010; Ajzen, 2012) to study the influence of the earlier introduced three types of factors which have been assumed to explain the relation between participation and performance. The theory of planned behavior distinguishes three antecedents of any particular kind of behavior (here: *employee job*

*performance*). The first one—*attitude*—is a motivational variable and is the person's view on a behavior. The second variable is a social variable called "*norm*," which comprises the extent to which employees think significant others expect them to behave in a certain way. The third variable—*control*—is cognitive in nature; it signifies the extent to which one feels capable of performing the behavior.

The theory of planned behavior has been shown to be able to predict and explain various kinds of behaviors in different contexts such as health, safety, intergroup relations and work motivation (Armitage & Conner, 2001; Fishbein & Ajzen, 2010). This theory has, to our knowledge, never been used to explain job performance before, but it has been suggested to be applicable (Fishbein & Ajzen, 2010). Consequently, this study's second contribution is empirically examining the theory of planned behavior in the realm of *employee job performance*.

As a third contribution, this study examines the role of *PM quality* in the link between *PM participation* and *employee job performance*. *PM quality* is defined as the extent to which employees find the performance measures sensitive to their actions, precise in measuring relevant aspects of their performance, and verifiable (Moers, 2006). It is important to look at such measurement properties, because performance measures only correctly reflect employee performance if they have good measurement properties. If performance measures do not correctly reflect employee performance, they steer employees into the wrong direction (e.g. Abernethy, Bouwens, & Van Lent, 2004; Banker & Datar, 1989). Thus, *PM quality* is considered an important antecedent of *employee job performance*. Examining *PM quality* within the field of organizational behavior for purposes of explaining job performance is therefore a unique third contribution of this study.

The remainder of this chapter is structured as follows. In Section 3.2 we set out our hypothetical model and formulate the specific hypotheses. In Section 3.3 we report how we collected survey data from both employees and their supervising managers. Section 3.4 presents the results of the study which support five of the seven hypotheses. The end of the chapter (Section 3.5) contains the theoretical and practical implications as well as the limitations of the study and provides suggestions for future research.

## 3.2 Theory and hypotheses development

Figure 3.1 shows our hypothetical model and the definitions of our constructs. First of all, it hypothesizes that when employees have an

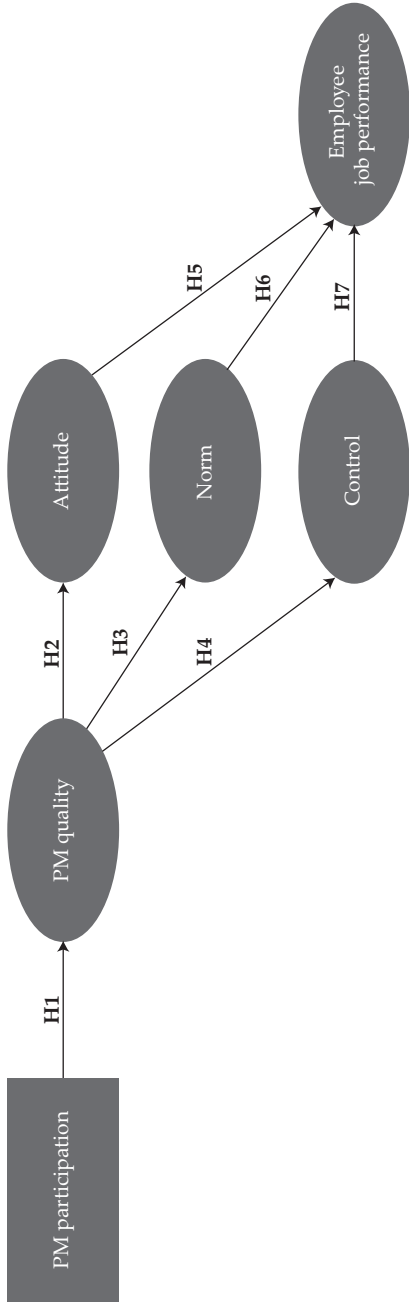
influence on the design of performance measures, they will find them to be of better quality than if they had no influence at all. Next, *PM quality* is hypothesized to be related to employees' *attitude*, *norm* and *control* towards performing well. These three variables in turn are hypothesized to be positively related to actually performing well. In the remainder of this section, we will elaborate on the theory that supports these hypotheses. For brevity, we refer to the constructs by their short names as indicated in Figure 3.1.

### 3.2.1 PM participation and PM quality

As noted earlier, *PM quality* is defined as the extent to which employees find the performance measures sensitive to their actions, precise in measuring relevant aspects of their performance, and verifiable (Moers, 2006). Most previous studies have focused on improving *PM quality* in the eyes of managers, since high quality performance measures can assist them with correctly assessing the performance of their employees (Moers, 2006). Yet having high quality performance measures is important for employees as well. For example, employees want their performance measures to be sensitive to their actions, because that means that their efforts will be recognized by the performance measures and consequently by their superiors (see Chapter 2). Moreover, employees want their measures to be precise; they want the performance measures to correctly reflect their performance (Keeping & Levy, 2000). And they want performance measures to be verifiable to know exactly what is expected of them (Hall, 2008).

Co-developing performance measures with employees can help increase *PM quality*, mainly because employees possess valid, unique and relevant information and insights which are important for a good design of performance measures (see Chapter 2; Roberts, 2002). Consistent with this, research has shown that if performance measures are developed in close consultation with the employees who are then measured by them, these employees are more positive about the developed performance measures (Abernethy & Bouwens, 2005; Wilderom, Wouters, & Van Brussel, 2007; Wouters, 2009), and they find the measures' feedback more useful (Kleingeld, et al., 2004). Employees perceive co-developed performance measures as a credible and powerful resource, and are therefore more likely to accept their output (Cawley, Keeping, & Levy, 1998; Luckett & Eggleton, 1991). *PM participation* leads to fewer measurement errors and to a better "fit" with the needs of the employees (Abernethy & Bouwens, 2005; Cavalluzzo & Ittner, 2004).

**Hypothesis 1.** *PM participation is positively related to PM quality.*



Short name	Construct definition
PM participation	The extent of influence employees feel they have had on the design of the PMs <sup>a</sup> (Abernethy & Bouwens, 2005)
PM quality	The extent to which employees find the PMs sensitive to their actions, precise in measuring relevant aspects of their performance and verifiable <sup>a</sup> (Moers, 2006)
Attitude	The employee's evaluation regarding always meeting all job requirements (cf. Fishbein & Ajzen, 2010)
Norm	The extent to which employees perceive significant others want them to always meet all job requirements and these significant others always do meet all job requirements (cf. Fishbein & Ajzen, 2010)
Control	The extent to which the employee believes to be capable of always meeting all job requirements (cf. Fishbein & Ajzen, 2010)
Employee job performance	The extent to which employees meet their job requirements according to their manager (Podsakoff & Mackenzie, 1989)

<sup>a</sup>In both definitions "the PMs" refers to the performance measures used to measure the employees' performance.

Figure 3.1 Hypothetical model including construct definitions

### 3.2.2 PM quality and attitude

The quality of performance measures is often assumed to be related to employees' attitude towards performing well (Kuvaas, 2006; Levy & Williams, 2004; from now on this variable is named "attitude"). *Attitude* is here defined as the employee's evaluation regarding always meeting all job requirements. To our knowledge, this is the first study which tests the *PM quality–attitude* relation empirically. We did find one study which demonstrated that more monitoring and feedback can influence employees' attitudes towards job related behavior (Siero, Boon, Kok, & Siero, 1989). We expect a relation between *PM quality* and *attitude* based on the following reasoning, derived from studies on related topics. When employees perceive the performance measures to be of high quality, they tend to reflect the employees' own beliefs. If employees believe performance is measured correctly, they will find it more meaningful to increase their performance, and thus they are more willing to put in effort into reaching the set performance targets (Fried & Ferris, 1987; Hackman & Oldham, 1976; Johns, Xie, & Fang, 1992; Sheldon & Elliot, 1998). Moreover, when the performance measures are of better quality, employees can have a better discussion with their managers about their performance (see Chapter 4), which increases their autonomous motivation (Deci, Koestner, & Ryan, 1999; Eisenberger & Cameron, 1996; Kuvaas, 2007) and eventually their *attitude* to perform well (Hagger & Chatzisarantis, 2007, 2009; Hagger, Chatzisarantis, & Harris, 2006). Additionally, when employees perceive performance feedback to be accurate, they are more eager to respond positively to that feedback (Kinicki, Prussia, Wu, & McKee-Ryan, 2004). Finally, *PM quality* also increases the fairness experienced by employees, which in turn increases *attitude* (Burney, et al., 2009).

**Hypothesis 2.** *PM quality is positively related to attitude.*

### 3.2.3 PM quality and norm

In this study's context, *norm* is defined as the extent to which employees perceive significant others as wanting them to always meet all the job requirements and the extent to which these significant others always try to meet all job requirements (cf. Bleakley & Hennessy, 2012; Fishbein & Ajzen, 2010). "Significant others" are people in one's work environment who are considered important to the employee. The definition of *norm* consists of two elements which Fishbein and Ajzen (2010) term "injunctive" and "descriptive" norms. "Injunctive norms refer to perceptions concerning what should or ought to be done with respect to performing a given behavior, whereas descriptive norms refer to perceptions that others are or are not performing the behavior in question" (Fishbein & Ajzen, 2010, p. 131).



Performance measures can increase injunctive norms because they clarify the requirements of someone's work role (Collins, 1982; Hall, 2008). The measures are developed by or with significant others, and thus reflect what they find important. If the performance measures are of better quality, they better communicate the expectations of these significant others and therefore employees will know better whether they are expected to always meet all job requirements.

Descriptive norms are also increased if the quality of these performance measures is better, because then high quality measures are likely to be used for discussions about employees' performance and these discussions facilitate employees to perform well (see Chapter 4). If everybody is performing well, performing well will be seen as the norm (especially when there are performance measures of high quality to show this high performance of others), and therefore employees will feel more social pressure to perform well too.

Just as with the relation between *PM quality* and *attitude*, empirical research on the relation between *PM quality* and *norm* is scarce. The same study as for the relation with *attitude* can be cited: the Siero et al. study showed a similar positive effect of monitoring and feedback on the normative beliefs of the mail-van drivers (Siero, et al., 1989). Moreover, just as *attitude*, *norm* was found to be influenced by autonomous motivation (Hagger & Chatzisarantis, 2007, 2009) and *PM quality* can increase the autonomous motivation because it allows employees to have a better discussion with their manager about their performance (see Chapter 4, Deci, et al., 1999; Eisenberger & Cameron, 1996; Kuvaas, 2007). In sum, we hypothesize:

**Hypothesis 3.** *PM quality is positively related to norm.*

### 3.2.4 PM quality and control

*PM quality* is also assumed to affect *control*. In this context, *control* is the extent to which employees believe to be capable of always meeting all job requirements (cf. Fishbein & Ajzen, 2010). Performance measures of good quality are found to be positively related to two aspects of *control*: i.e. an employee's belief in one's capacity to perform a job, and the extent to which employees can influence outcomes at work (Hall, 2008; Spreitzer, 1995, 1996). Moreover, performance measures give employees feedback about their performance which helps increase employees' knowledge and abilities to make informed and therefore better decisions (Sprinkle, 2003; Van Veen-Dirks, 2009). Employees are more likely to accept the feedback when they think the quality of the performance measures is high, because then they perceive the performance measures as a credible resource (Ilgen, et al., 1979). Furthermore, the better the *PM quality*, the better employees

know the objectives of the job and how to perform well in their jobs (Hall, 2008); high quality performance measures communicate to employees how one is supposed to do a good job (Melnyk, Stewart, & Swink, 2004). Furthermore, they may increase employees' self-efficacy (Latham, et al., 1994; Webb, 2004), which is comparable to *control* (Ajzen, 2012; Fishbein & Ajzen, 2010; Yzer, 2012).

**Hypothesis 4.** *PM quality is positively related to control.*

### 3.2.5 The theory of planned behavior and employee job performance

Based to the theory of planned behavior, we hypothesize relationships between *attitude*, *norm* and *control*, and the intended behavior (*employee job performance*). According to the theory of planned behavior, the extent to which people perform any kind of behavior can be explained by their attitude, perceived norm and/or perceived control to perform the behavior. Empirical support for the applicability of the theory of planned behavior to diverse kinds of behavior has been found in numerous studies and meta-analyses (Fishbein & Ajzen, 2010). The theory has mainly been applied to health behaviors such as quitting smoking or using condoms (Bartholomew, Parcel, Kok, & Gottlieb, 2001; Fishbein & Ajzen, 2010), but the theory has also been used in the field of organizational behavior (e.g. Dunn & Schweitzer, 2005; Hill, Mann, & Wearing, 1996; Jimmieson, Peach, & White, 2008). Fishbein and Ajzen (2010) presume the theory of planned behavior to be applicable to *employee job performance*, but to date this has not yet been tested. We expect all three possible antecedents of the theory of planned behavior to be related to *employee job performance* and will below explain the rationale behind these propositions.

According to Fishbein and Ajzen, job satisfaction is a form of someone's *attitude* towards job performance (Fishbein & Ajzen, 2010, p. 17). The relation between job satisfaction and job performance has often been studied and meta-analyses find a significant effect between the two (Judge, Thoresen, Bono, & Patton, 2001; Kinicki, McKee-Ryan, Schriesheim, & Carson, 2002). The definition of *attitude* (the employee's evaluation regarding always meeting all job requirements; see Figure 1) also shows a lot of resemblance with that of work motivation ("a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work related behavior, and to determine its form, direction, intensity, and duration", Pinder, 1998, p. 11). Theories of work motivation both theoretically and empirically advance the case that employees will perform better in their jobs if they are highly motivated (Muchinsky, 2003; Spector, 2006). Based on this, we expect a positive relation between *attitude* and *employee job performance*.

**Hypothesis 5.** *Attitude is positively related to employee job performance.*

Although most theories and research in organizational behavior regard motivational (*attitude*) and cognitive (*control*) factors as the predominant mechanisms underlying the positive performance effects of participation in general (e.g. Cawley, et al., 1998; Wagner, et al., 1997), as well as specifically with regard to designing performance measures (Kleingeld, et al., 2004), we argue in accordance with the theory of planned behavior that *norm* may be just as important. Erez and Arad (1986) took a similar stance and found support for it. When people do not act according to the norm of their organization or team, they risk punishments such as stigmatizing or rejection by the other organizational members (Muchinsky, 2003). Therefore, employees are more eager to perform well if the others do, try to or tell them to perform well.

**Hypothesis 6.** *Norm is positively related to employee job performance.*

Besides *attitude* and *norm*, *control* may also be an important antecedent of employee job performance (Ajzen, 2012; Fishbein & Ajzen, 2010). *Control* is almost the same as self-efficacy (Ajzen, 2012; Fishbein & Ajzen, 2010; Yzer, 2012), which is found to be related to employee job performance (Gardner, Dyne, & Pierce, 2004; Renn & Fedor, 2001). It refers to the presence of facilitators such as role clarity (which is found to be related to employee job performance; Whitaker, Dahling, & Levy, 2007), and the absence of hindrances to perform (Fishbein & Ajzen, 2010). *Control* may be the most important of the three, since it may be impossible to perform well if there are too many constraints (Ilgen, et al., 1979; Muchinsky, 2003; Spector, 2006). In Chapter 2 something similar was found when the theory of planned behavior was used to explain employee initiative behavior, which is an important part of employee job performance (Campbell, 2000; Crant, 2000; Frese & Fay, 2001). The study of Chapter 2 showed that all three antecedents of the theory of planned behavior (*attitude*, *norm* and *control*) were related to employee initiative and when all antecedents were analyzed together in a regression analysis, only *control* remained significant. The study of Chapter 2 was based on only one (manufacturing) organization. Whether these results generalize to other settings remains to be seen. It would be interesting to find out if the same is found for *employee job performance* in the broader and bigger sample of the current study.

**Hypothesis 7.** *Control is positively related to employee job performance.*

### 3.3 Method

In order to collect data to test our hypotheses, we employed an online survey. This section gives details about the respondents, instrumentation and statistical analyses.

### 3.3.1 Respondents

The respondents in our study were drawn through snowball sampling, which means that every potential participant was asked for contact details of other potential participants. Snowball sampling is recommended when the population of interest is “hidden”, i.e. for the researchers it is impossible to know who meets the participation criteria before contact is made with the potential respondent (Salganik & Heckathorn, 2004). We were looking for very specific respondent pairs. We needed pairs of employees and managers who met the following criteria: (1) they must have worked together in their current functions for at least one year; (2) the employees had to be professionals or members of staff in line positions at the lowest hierarchical level of the organization; (3) the manager must use performance measures to measure the employee’s performance. The last criterion made it especially difficult to find respondents.

Our starting point for finding respondents was our own network. Some of the contacted people/organizations helped us to get access to a larger number of people. For example, one consultancy organization sent a request to participate in this study to its complete database containing around 5000 Dutch organizations. Furthermore, we tried to get attention for completing our survey by publishing three articles in Dutch professional journals and by organizing two seminars about “developing useful performance measures.” Before respondents participated in a seminar, they filled out the survey.

All potential respondents were asked first to complete a short online survey to check if they met the selection criteria. This survey included the question whether they were an “employee” or a “manager.” Employees who met the criteria were asked for the contact details of their managers; they then immediately received the link to the actual survey. Managers who agreed to participate provided us with the contact details of one or more of their employees. After one of them (randomly chosen by us) completed the survey<sup>2</sup>, we contacted the manager again to also complete a survey via internet. All respondents were assured a strictly confidential treatment of their data. After participating, they received a free copy of the research report, including their personal scores, benchmarked to the average of all the other participating pairs.

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<sup>2</sup> Approaching more than one employee per manager would increase the workload of the manager too much since they then were to complete a survey for every participating employee. Each survey took about 10 minutes to complete, because it was part of a larger survey in which our research question was approached from two different perspectives. The results on the other perspectives are discussed in Chapter 4.

The initial short survey presented us with 21 employees and 74 managers who were willing to participate and met the inclusion criteria, potentially giving us 95 pairs. Eventually we got a response from 95 non-managerial employees and 88 of their managers; thus 88 complete pairs (94%). Table 3.1 gives an overview of the characteristics of the respondents. Since our model consists of 6 variables and we used 24 indicators to measure them, we desired to have at least 100 pairs of respondents (Westland, 2010). However, during our research we noticed only a small number of organizations had actually implemented a performance measurement system at their lower hierarchical levels. So our population was restricted in size. In such situations—as an exception—structural equation modeling can be used on smaller samples (Kline, 2011, p. 12). As a check on robustness we performed the same analyses on the response of all 95 employees (see Section 3.4.2).

**Table 3.1** Respondent characteristics

Characteristic		All employees (N=95)	Employees with response of manager (N=88)	Managers (N=88)
Sex	% male	74	73	89
	% female	26	27	11
Education	% lower	7	8	5
	% intermediate	28	28	16
	% higher	33	33	45
	% scientific	27	26	28
	% missing	5	5	6
Age	mean (SD)	39 (9.4)	39 (9.6)	45 (6.7)
Departmental tenure	mean (SD)	6.1 (6.0)	6.2 (6.1)	7.8 (6.1)
Span of control	mean (SD)	N/A	N/A	35 (51)
# Employees in organization	mean (SD)		5582 (23467) min. 7, max. 150000	

### 3.3.2 Survey instrument

We tried to prevent common method bias in several ways following the guidelines of Podsakoff, MacKenzie, Lee and Podsakoff (2003). First of all, we measured our dependent variable—employee job performance—by surveying the managers (see the meta-analyses of Wagner & Gooding, 1987ab which show if participation research uses only a single source, it often gives inflated results). All the independent variables were

based on the employees' self-reports. To prevent common method bias in the independent variables, we surveyed the constructs in a different order than the order of the model, and we emphasized confidentiality of the answers. Moreover, each survey page only contained the items concerning the same construct, which leads to data of higher quality because it helps the respondents to understand the items better (Frantom, Green, & Lam, 2002). Our third approach against common method bias among the independent variables was to have a separate introduction for the questions of each construct. Finally, we statistically checked for the presence of common method bias after data collection (see Section 3.4.4).

We pre-tested the survey among 17 employees who met the survey's inclusion criteria (cf. Anderson & Gerbing, 1991). For the pretest we used Anderson and Gerbing's (1991) item-sort task, Hak et al.'s Three-Step Test-Interview method (Hak, Van der Veer, & Jansen, 2008) and reliability and factor analyses. This triangulation helped us to shorten the survey further and convinced us our measures were valid.

All the items were in Dutch and had a 7-point fully anchored Likert scale: (1) Totally disagree, (2) Disagree, (3) Moderately disagree, (4) Neutral, (5) Moderately agree, (6) Agree, (7) Totally agree. An overview of the items is given in Appendix A. The rest of this section reports on the ways in which the constructs were measured.

***PM participation.*** We used Abernethy and Bouwens's (2005) "influence on the system design" scale to measure *PM participation*, since it covers exactly our definition of *PM participation*: the extent of the influence employees feel they have had on the design of the performance measures. *PM participation* consists of five items and has a Cronbach's alpha of .94. Both the items "I have/had influence on ongoing modifications to the design of the performance measures" and "I have/had influence on the maintenance of the performance measures" suggest the performance measures can be adjusted when they are already in use. Especially in the Dutch language, these items are so similar, that their error terms are probably related. Therefore, we allowed their error terms to covary.

***PM quality.*** *PM quality* was measured with five items from Moers's (2006) "performance measurement properties" scales which were also used in Chapter 4 in which *PM quality* is rated by the manager<sup>3</sup>. Assessed is the extent to which employees find the performance measures sensitive to their actions; precise in measuring relevant aspects of their performance; and verifiable. Cronbach's alpha is .80.

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<sup>3</sup>The managerial scale of Chapter 4 uses one item less than the current non-managerial scale, because whether the input of an employee influences their score is important for employees, but not for managers. Managers mainly look at output when determining employee job performance, while employees usually also want their efforts to be displayed through performance measurement.

Because the pretest was not sufficiently conclusive as to which items of the original scale were valid, we included more items than what we intended to use eventually. We analyzed the properties of the quality items before testing the hypotheses to ensure that we would not create false positives by “cherry-picking” items which worked well with the other variables of our model. An example of items which we deleted were the four negatively formulated items of the original scale. Our analyses showed that these items defined the scale, probably because together they had a high internal consistency, but theoretically, they seem most remote from how we defined *PM quality* (see the Appendix). Moreover, originally we used three items to cover whether the input of the employees is displayed in the performance measures or not. These three items over-represented this aspect of *PM quality*, so we deleted the two of these three items with the smallest item loadings. As a robustness check we also performed our final analyses including these two items and allowing the error terms of the three “input-items” to covary. This analysis showed similar results as the model with five items (see Table 3.4, Model 2).

**Theory of planned behavior.** *Attitude, norm* and *control* are each measured with three items which were self-constructed, based on the given guidelines for constructing theory-of-planned-behavior questionnaires (Darker & French, 2009; Fishbein & Ajzen, 2010; Francis et al., 2004). Before the pretest, seven items had been formulated for each of the three constructs, and we chose the three (times three) best. The Cronbach’s alphas are .87 for *attitude*, .86 for *norm* and .61 for *control*. The Cronbach’s alphas of *attitude* and *norm* are good, but the one of *control* is only just large enough for research on a group level (Evers, Lucassen, Meijer, & Sijtsma, 2010). This is typical for the measurement of *control* (Ajzen, 2002). In hindsight, this relatively low Cronbach’s alpha may be explained by the fact that two of these three items were negatively formulated. Such items have created problems in other research on the theory of planned behavior as well (Yzer, 2012). Therefore, as a robustness check we also analyzed the model in which *control* was measured with only one item, which is often done in theory-of-planned-behavior research (Bleakley & Hennessy, 2012; Fishbein & Ajzen, 2010). We found no appreciable differences (see Table 3.4, Model 3).

**Employee job performance.** We measured *employee job performance* with five items. They assess the managers view on the extent to which employees meet their job requirements. Getting employees to meet the job requirements is the behavior which performance measures usually aim to stimulate (Williams & Anderson, 1991), so we think this scale is relevant here. The scale was initially developed by Williams (see Williams & Anderson, 1991), and was later revised and shortened by Podsakoff and

MacKenzie (1989). It is applicable to all kinds of jobs and industries and therefore it fits our research design. Earlier research showed that this scale highly correlates with objective measures of performance (Burney, et al., 2009). The Cronbach's alpha of this job performance scale is .91.

**Control variables.** The control variables used in our study are: employee sex, educational level, age and departmental tenure. These demographic variables may give an alternative explanation for the differences in the ratings of employee job performance (cf. Ali & Davies, 2003; Quinones, Ford, & Teachout, 1995). Employees were not obliged to complete their demographic characteristics, hence some values are missing for the educational variable.

### 3.3.3 Statistical analyses

Statistical analyses were performed with structural equation modeling using maximum likelihood estimation of AMOS 18. Before the analyses, we screened the data (Kline, 2011, pp. 51-68). We found no indications of extreme collinearity. Moreover, we found no outliers ( $p < .001$ ) and no univariate nonnormality, but multivariate kurtosis was too high, so we used bootstrapping as a robustness check to ensure this did not influence our results (Kline, 2011, p. 177; Nevitt & Hancock, 2001).

We used Anderson and Gerbing's (1988) two-step modeling approach. This approach has several advantages compared to only estimating the structural model: in cases of poor model fit it is easier to find out why the model fits poorly, and it makes it possible to see if the empirical definitions of the constructs are similar for different configurations of the model (Burt, 1976). The first step of the two-step approach estimates the fit of the measurement model. The measurement model is a model in which all items are only allowed to load on their own factor and all constructs are allowed to correlate freely with each other. Once the measurement model is adequate, the structural model can be analyzed (step 2). The difference between the structural model and the measurement model is that in the structural model the factors are not allowed to freely correlate, but they are related to the other factors strictly based on the hypothetical model. To assess robustness of the found significant levels of the path coefficients we used maximum likelihood bootstrapping with 1999 bootstrap samples and the percentile and bias-corrected confidence intervals were set to 95%.

To determine model fit we used chi-square, supplemented with the Bollen-Stine bootstrap as it gives a more reliable estimate of the significance level in case the data is not multivariate normal (Nevitt & Hancock, 2001). It is generally recommended to also use other model fit indices, because



chi-square is often inappropriate (Bentler, 1990). As recommended by Schreiber et al. (2006) we used CFI, TLI and RMSEA. The cut off CFI and TLI values are recommended to be around .95 and RMSEA around .06 (Hu & Bentler, 1999).

## 3.4 Results

### 3.4.1 Main model

As a first step the measurement model was analyzed; i.e. all the items were only allowed to load on their own construct, and all the constructs were allowed to covary with each other. The model fit was sufficient ( $\chi^2=310.26$ ,  $df=237^4$ ,  $p=.001$ ; Bollen-Stine  $p=.364$ ; CFI=.939; TLI=.929; RMSEA=.060). Table 3.2 shows the standardized estimated factor loadings and Table 3.3 shows the correlations between the constructs.<sup>5</sup>

The model fit of the structural model was also sufficient ( $\chi^2=318.38$ ,  $df=244$ ,  $p=.001$ ; Bollen-Stine  $p=.369$ ; CFI=.938; TLI=.930; RMSEA=.059; see Table 3.4, Model 1) and the factor loadings are similar to those of the measurement model; in other words the constructs denote the same thing in both the measurement and the structural model. The standardized path coefficients of the structural model are shown in Figure 3.2. The bootstrap results show similar significance levels.

The results support Hypothesis 1 (*PM participation–PM quality*), Hypothesis 3 (*PM quality–norm*), Hypothesis 4 (*PM quality–control*) and Hypothesis 7 (*control–employee job performance*).

### 3.4.2 Remedies for the small sample size

As discussed in Section 3.3.1 our sample size is a bit smaller than ideal. This may create a particular problem when one conducts a SEM analysis with as many estimation points as in this study. Therefore, we also check if the results hold if we analyze a path model in which the constructs are

<sup>4</sup> The error term of the first item of control had a negative variance. We solved this following the guidelines of Chen et al. (2001) by eventually constraining the variance of that error term to 1. This has no effect on the magnitude of the standardized factor loadings of the factors, except for the variable “control”, which now has more realistic standardized factor loadings (without the constraint, the factor loading would be larger than 1). Note that this problem does not occur in the structural model, which means the estimations of the structural model are probably more valid. This indicates that the data have a better fit with the structural model (Chen, Bollen, Paxton, Curran, & Kirby, 2001).

<sup>5</sup> To give insight into the correlations with the four control variables, Table 3.3 gives estimates of the model including the control variables. These estimates differ maximally .01 from the estimates of the model without control variables.

**Table 3.2** Descriptive statistics and factor loadings of the measurement model

Latent variables	$\alpha$	N	M	SD	Min	Max	Standardized factor loadings <sup>a</sup>	Un-standardized factor loadings <sup>a</sup>
PM participation	0.94							
Item 1		88	3.50	1.96	1	7	0.90	1.00 ***
Item 2		88	3.61	1.86	1	7	0.88	0.93 ***
Item 3 <sup>b</sup>		88	3.44	1.77	1	7	0.81	0.81 ***
Item 4		88	3.23	1.69	1	7	0.91	0.82 ***
Item 5 <sup>b</sup>		88	3.45	1.74	1	7	0.83	0.82 ***
PM quality	0.80							
Item 6		88	4.23	1.69	1	7	0.50	1.00 ***
Item 7		88	4.13	1.57	1	7	0.86	1.60 ***
Item 8		88	4.44	1.62	1	7	0.78	1.48 ***
Item 9		88	4.90	1.41	1	7	0.65	1.08 ***
Item 10		88	4.68	1.53	1	7	0.53	0.96 ***
Attitude	0.87							
Item 11		88	5.80	0.89	3	7	0.82	1.00 ***
Item 12		88	5.77	0.99	3	7	0.89	1.21 ***
Item 13		88	5.77	1.00	2	7	0.80	1.10 ***
Norm	0.86							
Item 14		88	5.13	1.12	2	7	0.64	1.00 ***
Item 15		88	4.74	1.24	2	7	0.96	1.65 ***
Item 16		88	5.19	1.13	2	7	0.84	1.32 ***
Control	0.61							
Item 17		88	3.48	1.63	1	7	0.79	1.00 ***
Item 18		88	4.69	1.21	2	7	0.56	0.52 ***
Item 19		88	3.22	1.41	1	7	0.46	0.49 ***
Employee job performance	0.91							
Item 17		88	5.99	1.02	2	7	0.76	1.00 ***
Item 18		88	5.69	1.11	2	7	0.89	1.26 ***
Item 19		88	5.47	1.12	2	7	0.83	1.20 ***
Item 20		88	5.48	1.01	2	7	0.85	1.10 ***
Item 21		88	5.32	1.17	2	7	0.79	1.19 ***

\*\*\*p<.001

<sup>a</sup>Only the estimated factor loadings are shown in the tables. The loadings of the measures on all other constructs (than the one the measure is posited to indicate) are set to zero.

<sup>b</sup>The error terms of these two items were allowed to covary: r=.388\*\*

Table 3.3 Construct variances (in parentheses on the diagonal axis) and correlations

	1	2	3	4	5	6	7	8	9	10
1 PM participation	(3.09) ***									
2 PM quality	0.42 ** (0.72) *									
3 Attitude	-0.01	0.16	(0.52) ***							
4 Norm	0.13	0.31 *	0.25 † (0.52) **							
5 Control	0.05	0.31 *	0.21 (1.68) ***							
6 Employee job performance	0.02	0.23 †	0.01	0.18	0.41 ** (0.60) ***					
7 Sex <sup>a</sup>	0.03	0.04	0.12	0.18	0.02	0.25 * (0.20) ***				
8 Education <sup>b</sup>	-0.11	-0.26 *	-0.22 †	-0.01	-0.03	0.22 †	0.11 (2.58) ***			
9 Age	0.04	-0.07	0.00	-0.14	-0.04	-0.07	-0.15	-0.20 † (91.3) ***		
10 Departmental tenure	0.03	-0.10	-0.01	-0.13	-0.16	0.01	-0.19 †	-0.18	0.30 ** (37.1) ***	

\*\*\*,  $p < .001$ ; \*\*,  $p < .01$ ; \*,  $p < .05$ ; †,  $p < .10$ ;  $p$ -values are two-tailed and were assessed using unstandardized estimates

<sup>a</sup>1 = male; 2 = female

<sup>b</sup>1 = lower vocational education; 2 = intermediate general education; 3 = intermediate vocational education; 4 = higher general education;

5 = higher vocational education; 6 = scientific education

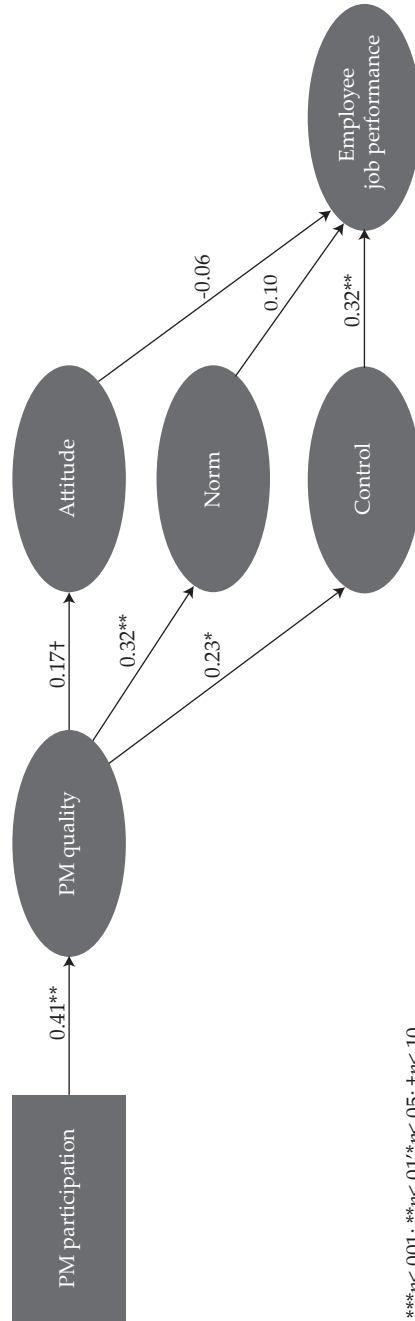
**Table 3.4** Standardized regression weights and model fit

Independent variable	Dependent variable	Model 1 Structural model with 88 pairs of respondents "quality" measured with 7 items	Model 2 Structural model with 88 pairs of respondents "quality" measured with 7 items	Model 3 Structural model with 88 pairs of respondents "control" measured with 1 item	Model 4 Path model with 88 pairs of respondents and 88 managers	Model 5 Structural model with 95 employees and 88 managers	Model 6 Structural model with 88 pairs of respondents and 88 managers
H1 PM participation	PM quality	0.41 **	0.42 **	0.40 **	0.40 ***	0.41 **	0.41 **
H2 PM quality	Attitude	0.17 †	0.16	0.16 †	0.13	0.19 †	0.17 †
H3 PM quality	Norm	0.32 **	0.32 **	0.32 *	0.26 **	0.31 **	0.33 **
H4 PM quality	Control	0.23 *	0.22 *	0.40 **	0.23 *	0.33 **	0.34 **
H5 Attitude	Employee job performance	-0.06	-0.06	-0.05	-0.09	-0.07	-0.05
H6 Norm	Employee job performance	0.10	0.10	0.13	0.09	0.09	0.03
H7 Control	Employee job performance	0.32 **	0.32 *	0.30 **	0.34 ***	0.39 **	0.44 **
<i>Control variables</i>							
Sex employee	Employee job performance						0.25 **
Education level employee	Employee job performance						0.22 *
Age employee	Employee job performance						-0.02
Departm. tenure employee	Employee job performance						0.16 †

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , † $p < .10$ ;  $p$ -values are one-tailed

Table 3.4 continued

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Model fit indices</i>						
$\chi^2$	318.38	358.03	246.43	8.28	324.77	411.44
<i>df</i>	244	288	202	8	244	332
<i>p</i>	0.001	0.003	0.018	0.407	0.000	0.002
CFI	0.938	0.948	0.961	0.992	0.937	0.933
TLI	0.930	0.941	0.955	0.984	0.923	0.919
RMSEA	0.059	0.053	0.050	0.020	0.059	0.052



\*\*\* $p < .001$ , \*\* $p < .01$ \*,  $p < .05$ ; + $p < .10$

Figure 3.2 Standardized path coefficients for the structural model

measured with factor regression scores instead of item scores. The path model showed an excellent model fit ( $\chi^2=8.28$ ,  $df=8$ ,  $p=.407$ ; Bollen-Stine  $p=.437$ ; CFI=.992; TLI=.984; RMSEA=.020) and the same paths are significant as in the structural model. The standardized path coefficients of the path model are shown in Table 3.4 (Model 4).

Another way to deal with the relatively small sample is to also include the responses of employees for whom we did not receive a manager's response. Since we were not sure if these values were missing at random, we did not use them for our initial analyses, but we used them as a robustness check. Including these employees increases the sample size to 95, which is close to the ideal minimum number of 100 respondents. This analysis had 7 (respondents) times 5 (items) missing values, since the managers' answers were only used in this study to assess employee job performance.

The results of the analyses with the larger sample are similar to those of our initial findings (i.e. support for the same hypotheses 1, 3, 4, and 7 is found; see Table 3.4, Model 5; measurement model:  $\chi^2=310.35$ ,  $df=236$ ,  $p=.001$ ; CFI=.942; TLI=.927; RMSEA=.058; structural model:  $\chi^2=324.77$ ,  $df=244$ ,  $p=.000$ ; CFI=.937; TLI=.923; RMSEA=.059). Probably due to its bigger sample size, this model does not have any problems with negative variances (cf. Footnote 4), which means that the measurement of control is more accurate here than in Model 1 of Table 3.4.

### 3.4.3 Control variables

We added employee sex, education, age, and departmental tenure as control variables to see if the found relations with employee job performance can be explained by demographic differences. The model fit of both the measurement model ( $\chi^2=384.58$ ,  $df=309^6$ ,  $p=.002$ ; CFI=.937; TLI=.917; RMSEA=.053) and the structural model ( $\chi^2=411.44$ ,  $df=332$ ,  $p=.002$ ; CFI=.933; TLI=.919; RMSEA=.052) are sufficient. Variances in age and education of the employee explain a significant amount of the variance in performance, and the regression weights of our hypothesized model are almost identical to our earlier results (see Table 3.4, Model 6).

### 3.4.4 Common method bias

Podsakoff et al. (2003) recommend to not only prevent common method bias in the way we discussed in Section 3.3.2, but to also statistically control

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<sup>6</sup> Just as in the model without the control variables, the error term of the first item of control had a negative variance (see Footnote 5). Again, we solved this following the guidelines of Chen et al. (2001) by eventually constraining the variance of that error term to 1.

for common method bias. We followed the bias-check recommendation of Podsakoff and Organ (1986)<sup>7</sup>: We performed a principal component analysis with the Eigen value > 1 criterion on all the items completed by the same person. The varimax rotated solution in Table 3.5 shows five factors corresponding to the five constructs. All the items loaded highest on their own construct. This means this study's results cannot be explained by common method bias (Podsakoff & Organ, 1986).

**Table 3.5** Varimax rotated component matrix

	PM participation	PM quality	Attitude	Norm	Control
PM participation 1	.889				
PM participation 2	.853				
PM participation 3	.865				
PM participation 4	.922				
PM participation 5	.855				
PM quality 1		.658			
PM quality 2		.831			
PM quality 3		.766			
PM quality 4		.719			
PM quality 5		.564			
Attitude 1			.899		
Attitude 2			.905		
Attitude 3			.883		
Norm 1				.806	
Norm 2				.890	
Norm 3				.910	
Control 1					.880
Control 2					.652
Control 3					.680

<sup>7</sup> Preferably, we wanted to use the Podsakoff et al. (2003) method of adding a latent "common method" variable, estimated from all the items of the independent variables which are —according to our hypotheses— supposed to be related to each other. Yet adding such a variable made the model too large to estimate.

### 3.4.5 Alternative models

According to the theory of planned behavior, one or more of the three types of antecedents of behavior (*attitude, norm and control*) are relevant for every kind of behavior. Research should investigate which antecedents lead to what kind of behavior (Ajzen, 2006). Our results indicate that *attitude* and *norm* are probably less relevant than *control*. In order to get more insight into the importance of the antecedents we investigated differences in model fit if the relations between the antecedents and job performance are constrained to be zero in several configurations. Table 3.6 shows the results of these analyses. According to the Anderson and Gerbing (1991) decision-tree framework, the model which constrains the *attitude–employee job performance* and *norm–employee job performance* relations to zero (Model 7 of Table 3.6) has the best model fit.<sup>8</sup> The bootstrap results show the same significance levels. This supports our initial findings, i.e. *PM participation* is related to *PM quality*, *PM quality* to *attitude, norm and control*, and *control* to *employee job performance*.

## 3.5 Discussion

Numerous empirical studies have tested various predictors of job performance. Assuming a positive effect of co-developing performance measures with employees (a relatively rare but promising workfloor practice, see Abernethy & Bouwens, 2005; Hunton & Gibson, 1999; Kleingeld, et al., 2004; Wouters & Wilderom, 2008) we examined in this study how such a positive effect may come about. In other words, this study examined how giving employees a say in the design of performance measures (*PM participation*) may lead to better *employee job performance*. As expected, *PM participation* is found to be positively related to the quality of the performance measures (Hypothesis 1). The higher employees rate *PM quality*, the higher the employees' *attitude, perceived norm and control* to perform well (supporting Hypotheses 2-4). Based on the theory of planned behavior (Fishbein & Ajzen, 2010) these three variables were hypothesized to lead to better *employee job performance* (Hypotheses 5-7). We only found support for the influence of *control* (Hypothesis 7).

<sup>8</sup> First we compared  $\chi^2$  of Model 2, 3 and 4 respectively with the initial model (Model 1) because they have only 1 extra degree of freedom and are therefore the next most likely constrained model. The model fits of Model 2 and 3 are not significantly different from the model fit of Model 1 (see Table 3.6) nor from the measurement model ( $\Delta\chi^2_{\text{Model 1}}=8.41, df=8, p=.394$  and  $\Delta\chi^2_{\text{Model 2}}=8.74, df=8, p=.365$ ), thus we accepted these models. The next most likely constrained model is Model 7. The model fit of Model 7 is not significantly different from Model 2 and 3 ( $\Delta\chi^2_{\text{Model 1}}=0.51, df=1, p=.475$  and  $\Delta\chi^2_{\text{Model 2}}=0.18, df=1, p=.671$ ) nor is it different from the measurement model ( $\Delta\chi^2=8.92, df=9, p=.445$ ), hence Model 7 should be accepted.



Table 3.6 Standardized regression weights and model fit of several alternative models

Independent variable	Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
H1 PM participation	PM quality	0.41 **	0.41 **	0.41 **	0.41 **	0.41 **	0.41 **	0.41 **
H2 PM quality	Attitude	0.17 +	0.17 +	0.17 +	0.17 +	0.17 +	0.17 +	0.17 +
H3 PM quality	Norm	0.32 **	0.32 **	0.32 **	0.33 **	0.32 **	0.33 **	0.32 **
H4 PM quality	Control	0.23 *	0.23 *	0.25 *	0.32 *	0.32 *	0.32 *	0.24 *
H5 Attitude	Employee job performance	-0.06	-	-0.05	-0.02	0.02	-	-
H6 Norm	Employee job performance	0.10	0.09	-	0.18 +	-	0.17 +	-
H7 Control	Employee job performance	0.32 **	0.31 **	0.36 **	-	-	-	0.35 **
<i>Model fit indices</i>								
	$\chi^2$	318.38	318.67	319.00	328.88	331.06	328.90	319.18
	<i>df</i>	244	245	245	246 <sup>a</sup>	247 <sup>a</sup>	247 <sup>a</sup>	246
	<i>p</i>	0.001	0.001	0.001	0.000	0.000	0.000	0.001
	$\Delta\chi^2$ with Model 1		0.29	0.62	10.50	12.68	10.52	0.80
	$\Delta df$		1.00	1.00	2.00	3.00	3.00	2.00
	$p(\Delta\chi^2)$		0.590	0.431	0.005	0.005	0.015	0.670
	Bollen-Stine <i>p</i>	0.369	0.375	0.370	0.314	0.306	0.318	0.377
	CFI	0.938	0.939	0.938	0.931	0.930	0.932	0.939
	TLI	0.930	0.931	0.931	0.923	0.922	0.924	0.932
	RMSEA	0.059	0.059	0.059	0.062	0.063	0.062	0.058

\*\*p<.01; \*p<.05; +p<.10; p-values are one-tailed

<sup>a</sup>To get a feasible solution we had to constrain the variance of the first item of control to 1

### 3.5.1 Implications for theory and practice

Earlier research has shown a relation between co-developing performance measures with employees and *employee job performance*, but it did not explain how the effect came about (Abernethy & Bouwens, 2005; Hunton & Gibson, 1999; Kleingeld, et al., 2004). Examining this effect is important, because this will give more insight into how *employee job performance* may be increased. This was the focus of the current study. The results of our study suggest that *PM participation* translates into a better quality of performance measures. Moreover, it was found that performance measures of better quality may give employees a feeling of control over their own performance, which in turn enables employees to perform well. Thus, it is important to have employees develop performance measures that assist *them* in improving their performance, rather than (only) managers (cf. Wouters & Wilderom, 2008). In other words, employee dashboards may effectively supplement management dashboards, especially if employees are given the chance to participate in the precise design of the measures. This gives the employee a heightened sense of performance control which seems to elevate their actual performance.

The second contribution of this study involved the applying of the theory of planned behavior to *employee job performance*. The theory of planned behavior is an established theory for predicting various kinds of behavior which had been suggested (but not yet tested) to apply to *employee job performance* (Fishbein & Ajzen, 2010). The theory of planned behavior puts forward three possible antecedents of any kind of behavior. Research has to find out which of the three are important for a particular kind of behavior. We hypothesized all three of them would be important for *employee job performance*, but we found support for only one of them: perceived control over one's performance. This means that for this broad sample of employees, *control* was the most important determinant of *employee job performance*. *Control* is the extent to which employees believe to be capable of always meeting all job requirements and is closely related to self-efficacy (Ajzen, 2012; Fishbein & Ajzen, 2010; Yzer, 2012). It is dependent upon *actual* control, which is the presence of facilitators such as role-clarity and skills and abilities, and the absence of environmental constraints to perform well on the job (Fishbein & Ajzen, 2010, p. 21).

The third contribution of this study was introducing *PM quality* as a possible explanation for the *PM participation–employee job performance* relation. As expected, *PM quality* did appear important in this link. In other words, to positively influence employee behavior and performance by *PM participation* one has to make sure that the type of *PM participation* used, leads to high quality performance measures (in the eyes of the

employees). An example of a *PM participation* process which has been demonstrated to lead to high quality performance measures is described in Chapter 2.

### 3.5.2 Limitations and suggestions for future research

A first limitation of this research is that we did not find a direct relation between *PM participation* and *employee job performance*, whereas other studies did (e.g. Chapter 2; Hunton & Gibson, 1999; Kleingeld, et al., 2004). In those other studies, *PM participation* consisted of a very intensive project in which employees developed most of the performance measures. In the current study, *PM participation* encompassed a broad range of more or less intensive ways of giving employees a say in the development of their performance measures. This participation-range issue is probably why this study did not find a direct relation between *PM participation* and *employee job performance* whereas the other studies did. This lack of a direct effect restrained us from testing for mediation using the criteria of Baron and Kenny (1986). Moreover, our sample size was too small (in combination with the effect size of the found relations) to detect a statistically significant indirect effect of *PM participation* on *employee job performance* with any other method (Fritz & MacKinnon, 2007). Nevertheless, we established a clear theory-based explanation of how co-developing performance measures may lead to better employee job performance. Future research would need to investigate if the here found variables are indeed full mediators. This can be done when looking at only the previously found effective (intensive) ways of *PM participation*. More insight into how job-performance enhancement might come about without negative human sight effects is relevant, particularly if employee engagement can be enhanced at the same time, which is the case if the process of *PM participation* is carried out well. The job-feedback literature might also help explore other organizational behavior type of variables involved in enhancing job performance through co-developed performance feedback (which is what performance measures—if well designed—are offering).

In this study *PM participation* encompassed both individual and group participation. Individual participation is supposed to be related to *control* via *PM quality*, as is discussed in Section 3.2. However, group participation is probably also directly related to control. Discussions with others from the group are likely to help employees get a more precise idea of what to do, and how to do it (Kleingeld, et al., 2004), and hence it gives them a higher sense of *control*. This is one of the reasons why group participation seems to have more stable and positive effects than individual participation

(Hunton & Gibson, 1999; Wegge, 2000). The number of respondents who had experienced group participation was too small to test this relation. New research is needed to find out more about cognitive clarifications of group discussions during the process of co-developing performance measures (see De Haas & Algera, 2002 for an exploration of this question).

A limitation of the cross-section survey-research design was that we could not test for causality. We chose for this research design, because we were more interested in statistically testing the hypotheses in a broad sample of employees in various jobs, organizations and industries. Chapter 2 already showed that *PM quality* and *attitude, norm and control to take improvement initiatives* increased after performance measures were co-developed with the employees. Since employee initiative is an important part of employee job performance (Campbell, 2000; Crant, 2000; Frese & Fay, 2001), we assumed that the relations found in the current study are causal as well. The current study extends the study of Chapter 2 by statistically testing the hypothesized relations and giving a better view on how—in general—*PM participation* may lead to *employee job performance*. Future research should find out if these results are applicable to singular organizations. Most probably, organizations which want to apply the current findings should investigate which of the three theory-of-planned-behavior antecedents are the most important in their particular context. This can be done via questionnaires or interviews (cf. Francis, et al., 2004).

Strictly speaking, the theory of planned behavior consists of more variables than we investigated here. For example, the complete theory also incorporates employee beliefs and outcome evaluations, which are indirect measures of *attitude, norm and control*. In the current study we were interested in the relative importance of the three core variables of the theory of planned behavior, in the degree to which they may explain the variance in *employee job performance*, and how these variables could be influenced by *PM participation* via *PM quality*. Extending our research by including beliefs in the survey would have made the survey too long, and including them in the model would have made the model too large to estimate. Chapter 2 investigated these employee beliefs with regard to attitude, norm and control to take initiative and they report how co-developing performance measures influenced attitude, norm and control via these beliefs.

Another variable of the theory of planned behavior not included in our study's model is employees' *intention* to perform well. Behavioral intentions are supposed to mediate between *attitude, norm and control*, on the one hand, and behavior on the other hand. They are typically included because they are a good proxy for the effects of an intervention

if the behavior itself is not (yet) measurable (Francis, et al., 2004). In this case we were able to measure *employee job performance*, so we did not need to include behavioral intentions in our model. We want to warn future researchers about using *intention* as a proxy for *employee job performance*. Even though we did not include *intention* in our model, we had included it in our survey.<sup>9</sup> We had done so merely to check if the problems we expected with this variable were indeed present. One problem is that *intention* to perform is almost the same as *attitude* to perform; i.e., it is very difficult to see the difference between the two variables hence participants responses to attitude items would probably be similar to the intention items.<sup>10</sup> As expected we found a high correlation between *attitude* and *intention* ( $r = .537, p < .001, N = 95$ ). Another problem is that *intention* is most likely dependent upon current performance in a negative way: employees who are currently not performing very well, probably wish they would have performed better, and are therefore more explicit about their intention to perform better next time. This is supported by the negative correlation between *intention* and *employee job performance* found in our data ( $r = -.224, p < .05, N = 88$ ). In sum, the *intention* variable of the theory of planned behavior is not applicable to *employee job performance* behavior.

### 3.5.3 Conclusions

Despite its limitations, this study gives an understanding of how *PM participation* may lead to better *employee job performance*. It showed that PM participation increases employees perceptions of the quality of the performance measures, which in turn increases employees' control over their own performance. Our results imply that if managers want to increase employee job performance, they must not only eliminate any constraints that prevent employees from performing well, they may also enable the employees to co-create measurement tools for calibrating their own performance. The development and implementation of high-quality performance measures can be such an enabler that comes about through giving the employees the opportunity to co-develop them. Chapter 2 showed how such co-development of performance measures with an employee empowering effect can be done successfully.

<sup>9</sup> Intention was measured by the following set of four items: "I am ready to always meet everything that is expected of me in my work," "I try to always meet everything that is expected of me in my work," "I do everything to always meet everything that is expected of me in my work" and "I will always meet everything that is expected of me in my work." Cronbach's alpha = .89.

<sup>10</sup> Compare this to other kinds of behavior for which the theory of planned behavior is often used, such as quitting smoking. The difference between someone's attitude to quit smoking (I find it positive to quit smoking) and intention to quit smoking (e.g. I intend to quit smoking within the next month) is much clearer.

## Appendix 3A. Measurement instruments

Answering format for all items in the questionnaire:

1. totally disagree – 7. totally agree

### Items “PM participation” (completed by employees)

I have/had influence on...

1. ...how the performance measures are designed
2. ...the choice of which data are used as input into the performance measures
3. ...ongoing modifications to the design of the performance measures
4. ...the implementation of the performance measures
5. ...the maintenance of the performance measures

### Items “PM quality” (completed by employees)

1. The performance measures measure only what I can actually influence
2. The performance measures express accurately whether I function well or not
3. If I perform well, it is directly reflected in the performance measures
4. The performance measures are objective and verifiable
5. Providing effort in my job leads to better performance on the performance measures
6. Working hard leads to better performance on the performance measures (deleted)
7. Devotion and effort in the job leads to better performance on the performance measures (deleted)

My performance expressed in the performance measures is strongly affected by...

8. ...changes in economic conditions (recoded and deleted)
9. ...decisions made in other parts of the organization (recoded and deleted)
10. ...changes in the behavior of parties outside the organization, such as customers, suppliers or
11. ...competitors (recoded and deleted)
12. ...factors beyond my responsibility (recoded and deleted)

**Items “attitude” (completed by employees)**

1. I find it positive to always meet everything that is expected of me in my work
2. It satisfies me to always meet everything that is expected of me in my work
3. I find it important to always meet everything that is expected of me in my work

**Items “norm” (completed by employees)**

1. They encourage me to always meet everything that is expected of me in my work
2. They themselves do always meet everything that is expected of them in their work
3. They themselves try to always meet everything that is expected of them in their work

**Items “control” (completed by employees)**

1. Certain conditions make it impossible for me to always meet everything that is expected of me in my work
2. It is totally up to me whether I always meet everything that is expected of me in my work
3. Certain factors make it difficult for me to always meet everything that is expected of me in my work

**Items “employee job performance” (completed by managers)**

1. He/she always performs all essential duties
2. He/she always fulfills all responsibilities required by his/her job
3. He/she always meets all formal performance requirements of the job
4. He/she always completes all duties specified in his/her job description
5. He/she never neglects aspects of the job that he/she is obligated to perform

# CHAPTER 4

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## How to increase employee performance with incentives after employees participated in the development of performance measures

Previous versions of this chapter have been presented at:

- 6th Conference on Performance Measurement and Management Control
- European Accounting Association Annual Congress 2012
- European Academy of Management Conference 2012
- Erasmus University Rotterdam
- University of Groningen
- University of Amsterdam
- University of Twente





# CHAPTER 4

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Marc J.F. Wouters

Celeste P.M. Wilderom

## ABSTRACT

Involving employees in the development of performance measures has generally been found to lead to better employee performance. In this study we examine how this happens by taking the perspective of supervisory managers who use performance measures to assess the performance of their employees. We focus on the quality of the performance measures and on using them for incentive purposes. The hypotheses are based on two theories: the agency and self-determination theories. A survey was completed by 86 pairs of non-managerial employees and their supervisory manager in various jobs and industries. We used structural equation modeling to test the hypotheses. Most were supported. Employee participation in the design of performance measures was found to be related to employee job performance via how the manager rates the quality of the performance measures and subsequently whether the manager uses the performance measures for evaluation purposes. No support was found for the hypotheses on the use of performance measures for monetary compensation or nonmonetary rewards to increase employee job performance. We discuss implications for management research and practice and sketch related future research.

## 4.1 Introduction

Employee participation in the development of performance measures (*PM participation*) is a topic in management accounting that is getting more and more research attention. Research has shown the beneficial effects of *PM participation* for individuals and organizations (see Chapter 2; Abernethy & Bouwens, 2005; De Haas & Algera, 2002; Hunton & Gibson, 1999; Kleingeld, Van Tuijl, & Algera, 2004; Li & Tang, 2009; Wouters & Wilderom, 2008). Also meta-analyses on various other kinds of employee participation found positive effects on performance (Combs, Liu, Hall, & Ketchen, 2006; Cotton, Vollrath, Froggatt, Lengnick-Hall, & Jennings, 1988; Derfuss, 2009; He & King, 2008; Miller & Monge, 1986; Rodgers & Hunter, 1991; Wagner, 1994; Wagner & Gooding, 1987; Wagner, Leana, Locke, & Schweiger, 1997). Far less research has investigated the possible mediating mechanisms that explain these results.

To be able to reap the metaphorical fruits of *PM participation* within organizations, it is important to understand how it is related to *employee job performance*. Earlier research has investigated how *PM participation* positively influences the *employees* who participated (e.g. Chapter 2; Abernethy & Bouwens, 2005; Wouters & Wilderom, 2008). The present study investigates the *PM participation–employee job performance* relation from the perspective of *supervisory managers* who use performance measures to measure the performance of their employees. Such a different perspective is important, because these managers are the ones who decide whether or not to involve employees in developing the performance measures. Before making this decision, they need to be convinced that *PM participation* can be beneficial for them and they need to know how to use these co-developed performance measures to increase *employee job performance*. As a first contribution of this study, both of these issues are addressed.

We focus on the job performance of employees in line positions in the lowest hierarchical level of an organization, such as shop floor employees and professionals. Therefore, wherever we talk about performance measures, we mean everything that is used to quantify the job performance of employees, including group performance measures. Examples of such measures are: client satisfaction, efficiency, the amount of work done in a certain amount of time and quality. Although most management accounting research focuses at performance measurement of managers, we believe *PM participation* to be particularly relevant at lower organizational levels. Non-managerial employees in the line of the organization often deal with very detailed operational characteristics of their work which tend to be

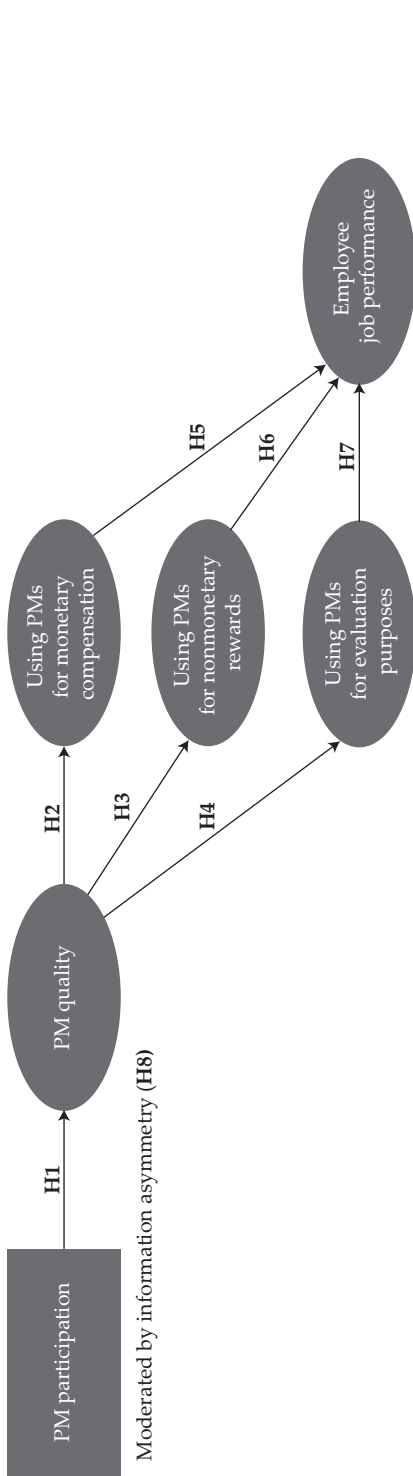
quite specific to their situation. This makes their job-specific knowledge essential for the development of valid operational performance measures. All too often their knowledge is underutilized, leading to suboptimal performance. Our argument here is that their participation in the design of performance measures results in better measurement properties of the measures, also from the manager's point of view. If the performance measures have better measurement properties, managers are more likely to use them for incentive purposes. And such incentives are supposed to stimulate employees to perform better.

The idea that incentives generally have a positive effect on *employee job performance* has dominated both the organizational behavior and management accounting literatures for ages. However, recently mainly organizational behavior scholars have started to question this idea: recent studies have shown incentives to have a negative influence on performance. These possible negative effects of incentives have been explained by self-determination theory, a theory which is also increasingly recognized within the field of management accounting as an alternative or at least an addition to parts of the classic agency theory (e.g. Guo, 2007; Kunz & Pfaff, 2002; Wong-On-Wing, Guo, & Lui, 2010). Based on these new insights and our empirical results, as a secondary contribution, this study gives a more nuanced view on the effects of using incentives than the so far prevalent view in management accounting.

Survey-data was collected from pairs of non-managerial employees and their supervisory managers working in many different jobs and industries. We have used structural equation modelling to test the hypotheses, which allows for valid and reliable hypotheses testing in complex models by estimating the model in its entirety (Werner & Schermelleh-Engel, 2009). We found that *PM participation* is related to *employee job performance* via both *PM quality* and whether the manager uses the performance measures for evaluation purposes. We found no support for the hypotheses on using the performance measures for explicit incentives to increase *employee job performance*.

## 4.2 Theory and hypotheses development

Figure 4.1 summarizes the study's specific model and includes definitions of the constructs. This section will explain the model from left to right and how the hypotheses were derived.



Short name	Construct definition
PM participation	The extent of influence employees feel they have had on the design of the PMs <sup>a</sup> (Abernethy & Bouwens, 2005)
PM quality	The extent to which managers find the PMs to be sensitive to the actions of their employees, precise in measuring relevant aspects of their employees' performance, and verifiable <sup>a</sup> (Moers, 2006)
Using PMs for monetary compensation	The extent to which managers find the PMs to be important for giving their employees salary increases, bonuses or extras <sup>a</sup> (Moers, 2006)
Using PMs for nonmonetary rewards	The extent to which managers find the PMs to be important for increasing their employees' chance of promotion or authority within the organization <sup>a</sup> (Moers, 2006)
Using PMs for evaluation purposes	The extent to which managers find the PMs to be important in performance evaluations, official performance ratings and periodic discussions <sup>a</sup> (Moers, 2006)
Employee job performance	The extent to which employees meet their job requirements according to their manager (Podsakoff & Mackenzie, 1989)
Information asymmetry	The amount of specific knowledge employees have as compared to their manager (Dunk, 1993)

<sup>a</sup>In all definitions "the PMs" refers to the performance measures used to measure the employees' performance.

Figure 4.1 Hypothetical model including construct definitions

#### 4.2.1 PM participation and PM quality

Most research that focused on employee participation in developing management control systems is in the area of participative budgeting (see Luft & Shields, 2007). Participative budgeting regards the influence of employees on the level of their (unit's) budget. *PM participation* is a broader phenomenon. Not only does it include other types of performance measures, besides budgets, it also goes beyond only determining the difficulty of the goals. *PM participation* encompasses the influence employees have in the development of all aspects of performance measures during all the developmental phases: design, implementation, and maintenance (Bourne, Mills, Wilcox, Neely, & Platts, 2000; Neely, Bourne, Mills, Platts, & Richards, 2002; Neely, Richards, Mills, Platts, & Bourne, 1997). Hence, it includes the design of the measures with regard to both content and appearance, the provision of data to enable regular reporting, the incorporation of the performance measures in the daily routine, and their continuous improvement. Our definition of *PM participation* is similar to Abernethy and Bouwens's definition of "influence on management accounting system design" (Abernethy & Bouwens, 2005, p. 226): the extent of the influence employees feel they have had on the design of the performance measures used to measure their performance.

The benefits of participative budgeting have already been studied extensively. A meta-analysis has shown it has a positive impact on for example, "budget usefulness," "budget relevance," and "attitude towards budget" (Derfuss, 2009). The most important reason for engaging in participative budgeting is to share information between subordinates and superiors (Shields & Shields, 1998). Just as with participative budgeting, *PM participation* also involves information sharing between subordinates and superiors. Such information sharing is important, because employees are assumed to have better knowledge about their jobs than their manager (see e.g. the literature review of Shields & Shields, 1998). When employees co-develop performance measures they may communicate some of their local job knowledge and incorporate it into the measures. This form of bottom-up knowledge transfer has been shown to increase the quality of the performance measures (see Chapter 2; Abernethy & Bouwens, 2005; Wouters & Wilderom, 2008). Most empirical research thus far has asked the participating subordinates to give their perception of the quality of the performance measures. In this study, we are interested in the supervising manager's opinion as to the performance measures' quality. We expect that they will also perceive the quality of the performance measures to be better if employees participated in developing them. This section explains why.

*PM quality* is defined as the extent to which managers find the performance measures to be sensitive to the actions of their employees, precise in measuring relevant aspects of their employees' performance, and verifiable (Moers, 2006). Having sensitive performance measures is beneficial for both the employees and the managers. Managers want sensitive performance measures because they need to be able to see a difference between good and bad performance (otherwise the performance measures would be useless). Likewise, employees want their efforts to be recognized and therefore to be reflected in their scores on the measures. Thus, employees want the performance measures to be sensitive at least in the upward direction. Since employees better know how the performance measures should be designed to be sensitive to their efforts (see the examples of Chapter 2), *PM participation* is expected to increase the sensitivity of the performance measures.

A similar argument is valid for the precision of the performance measures. Precision is the opposite of noise. Precise performance measures measure only those factors which can be influenced by the employees and not by noisy factors outside the employees' influence. In other words, precise measures only give a favorable indication if *the employee* functions well, and reversely. For the same reasons as with sensitivity, precision is beneficial for both the employees and the managers. Chapter 2 illustrated how employees better know how to increase precision. For a manager "functioning well" means that the efforts of employees should be directed at reaching the organization's goals, whereas employees would be more interested in measuring their own goals (which not necessarily corresponds to the organizational goals). Does this mean that *PM participation* can also *decrease* precision? Only if the managers are not involved in the development of the performance measures themselves. If managers are also involved in the development process, they will base the performance measures also on their own information. So the employee can only affect those parts of performance measurement which the manager does not yet know about. Of course employees may choose to keep their private information to themselves; in that case the precision will not increase if employees have influence. But most likely employees will reveal at least some private information; for example, because they do not know exactly what the manager does not yet know or because they think they will be better off revealing this information (cf. the economic models of Baiman & Evans, 1983; Christensen, 1982; Penno, 1984). Furthermore, many empirical studies have shown that employees are more honest in participation situations than would be expected by agency theory (Brown, Evans III, & Moser, 2009). Hence, we expect that PM precision will also be better after *PM participation*.

Likewise, participation may enhance verifiability, because employees usually better know what data sources are useful and what the data represent (cf. Chapter 2). When employees are involved in developing performance measures they will share their knowledge if they are convinced it will benefit them, or if they are not aware of their information advantage relative to their manager. Again, assuming managers use their own knowledge as a basis for the performance measures, the performance measures' verifiability will not decrease and may even increase after *PM participation*.

In sum, we expect *PM participation* to positively influence the sensitivity and precision of the performance measures and to at least not decrease their verifiability, leading to the following hypothesis.

**Hypothesis 1.** *PM participation is positively related to PM quality.*

#### 4.2.2 PM quality and using PMs for incentives

Control systems often consist of performance measures and a compensation system (Banker & Datar, 1989; Jensen & Meckling, 1992). The performance measures give employees direction, and the compensation system provides the incentives to go in that direction. If the performance measures are of high quality, they show with high sensitivity, precision and verifiability whether an employee has performed well, which makes giving incentives based on these performance measures more valuable (Banker & Datar, 1989; Feltham & Xie, 1994; Holmström, 1979; Moers, 2006). Prior research therefore often assumed a relation between *PM quality* and *using PMs for incentives* (e.g. Moers, 2006). Yet as far as we are aware, this relation has not been tested empirically.

Incentives do not always need to be monetary in nature. We define *using PMs for incentives* as the extent to which managers find these measures important for evaluation purposes, monetary compensation as well as nonmonetary rewards (Moers, 2006). The reasons for distinguishing between these three types of incentives are explicated in the next section (4.2.3). The definitions of these three types of incentives are based on Moers's (2006) scale for using performance measures for incentive purposes (see Figure 4.1).

**Hypothesis 2.** *PM quality is positively related to using PMs for monetary compensation.*

**Hypothesis 3.** *PM quality is positively related to using PMs for nonmonetary rewards.*

**Hypothesis 4.** *PM quality is positively related to using PMs for evaluation purposes.*



### 4.2.3 Using PMs for incentives and employee job performance

According to the agency theory, managers (principals) have to make sure that their employees (agents) work in a way that contributes to the overall organizational objective (Jensen & Meckling, 1992). The theory presumes that employees are self-interested and that this self-interest is different from the interest of the organization. The theory advocates using (monetary and/or nonmonetary) incentives to align the interest of the employee with the interest of the organization. In line with the expectancy theory, the agency theory suggests that people want to perform better if they expect to receive a reward for good performance, because it will then personally benefit them (Bonner & Sprinkle, 2002). Meta-analyses have shown the overall positive effects of various types of incentives on performance (Jenkins Jr., Mitra, Gupta, & Shaw, 1998; Stajkovic & Luthans, 1997, 2003).<sup>1</sup> In this study, we define *employee job performance* as the extent to which, in the manager's eyes, employees meet their job requirements (Podsakoff & Mackenzie, 1989).

**Hypothesis 5.** *Using PMs for monetary compensation is positively related to employee job performance.*

**Hypothesis 6.** *Using PMs for nonmonetary rewards is positively related to employee job performance.*

**Hypothesis 7.** *Using PMs for evaluation purposes is positively related to employee job performance.*

Contrary to the agency theory, the self-determination theory acknowledges that the employees' self-interest does not necessarily differ from the interest of the organization (Kunz & Pfaff, 2002). If employees have the same interest as their organization, we may expect other relations between *using PMs for incentives* and *employee job performance*. A meta-analysis showed for example that monetary compensation has a positive effect on performance if people find a task uninteresting, but for already interesting tasks, it has a negative effect (Weibel, Rost, & Osterloh, 2010). This can be explained by the self-determination theory.

The self-determination theory describes a continuum from autonomous to controlled motivation (Ryan & Deci, 2000). Autonomous motivation means that people feel that they have the choice to do something, whereas controlled motivation involves the feeling that they are being pressured

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<sup>1</sup>Note that low complexity tasks in these meta-analyses are overrepresented. As we discuss in Section 4.2.4, research has shown that incentives generally work well for tasks of low complexity, whereas they have detrimental effects on performance for high-complexity tasks (Stajkovic & Luthans, 2003).

to do something (Gagné & Deci, 2005). Autonomous employee motivation is shown to positively influence employee performance, whereas the opposite—controlled motivation—undermines employee performance (see Gagné & Deci, 2005 for an overview). People generally see explicit incentives as a controller of their behavior (Deci, Koestner, & Ryan, 1999; Holmås, Kjerstad, Lurås, & Straume, 2010). Therefore, explicit incentives can lead to less autonomous motivation and consequently to less *employee job performance* (Deci, et al., 1999; Falk & Kosfeld, 2006; Wong-On-Wing, et al., 2010). This view has long been neglected by accounting scholars, but is receiving increasingly more of their research attention; see, for example, the review study by Kunz and Pfaff (2002) and the empirical studies of Guo (2007) and Wong-On-Wing et al. (2010). Bénabou and Tirole (2003) and James Jr. (2005) have shown how this phenomenon can be rationally explained and they provided a formal analysis which may convince accounting scholars of this effect often termed the “crowding-out effect.”

Explicit incentives can be both monetary and nonmonetary as long as the incentives are concrete, such as an increase in salary or a promotion opportunity. We distinguish between monetary and nonmonetary rewards, since nonmonetary rewards have not, to date, been included in a lot of research. It is not clear whether nonmonetary rewards would have the same detrimental effect on autonomous motivation, since they are often less concrete than monetary rewards.

**Hypothesis 5a.**<sup>2</sup> *Using PMs for monetary compensation is negatively related to employee job performance.*

**Hypothesis 6a.**<sup>2</sup> *Using PMs for nonmonetary rewards is negatively related to employee job performance.*

Contrary to what happens when explicit incentives are used, meta-analyses show that when verbal rewards are used, autonomous motivation increases (Deci, et al., 1999; Eisenberger & Cameron, 1996). Verbal rewards are part of what we define as “evaluation purposes” and it includes performance evaluations, official performance ratings and periodic discussions (Moers, 2006). Consistent with the self-determination theory, we expect that *using PMs for evaluation purposes* does not diminish positive effects, hence we expect an increase in *employee job performance*. In other words, the self-determination theory supports Hypothesis 7 so we have no alternative hypotheses for it.

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<sup>2</sup>The “a” hypothesis stands for the alternative hypothesis derived from a different theory.

#### 4.2.4 Information asymmetry

According to the agency theory, using performance measures is only relevant if there is *information asymmetry*. *Information asymmetry* means that employees have more specific knowledge with regard to their jobs than their managers. Without *information asymmetry*, the manager would be perfectly able to assess and reward employees' performance without having and using performance measures. Since *information asymmetry* is present in most business situations we would expect to find the hypothesized relations even without considering *information asymmetry*. But in cases where there is relatively more information asymmetry we expect to find stronger relations. We also expect *information asymmetry* to have a moderation effect on the hypotheses that are not directly derived from the agency theory, as we will explain next.

We hypothesize the relation in Hypothesis 1 to be stronger when there is more *information asymmetry*, because more *information asymmetry* increases the contribution of specific job-relevant knowledge by the employee to the design of the performance measures, increasing *PM quality*. Furthermore, we expect a moderation effect in Hypotheses 2-4 since using performance measures is more relevant for managers if *information asymmetry* is greater. The quality of performance measures may then become a stronger antecedent of its use for incentive purposes. The same is assumed to apply to Hypotheses 5-7; we expect that more *information asymmetry* is accompanied by a stronger relation between *using PMs for incentive purposes* and *employee job performance*. In terms of Hypotheses 5a and 6a, if there is more *information asymmetry* we expect to find a stronger negative relation between *using PMs for monetary or nonmonetary incentives* and *employee job performance*. The effects of incentives on performance have repeatedly been shown to be more positive for jobs in manufacturing firms (in which there is generally less *information asymmetry*) than for jobs in the service sector (Stajkovic & Luthans, 1997). Moreover, *information asymmetry* can be seen as a proxy for job complexity. That is, we assume employees have more specific information about their own job than their manager if their jobs are complex. In complex jobs, the costs of performing well outweigh the benefit of receiving the incentive (assuming the incentive is equal for all levels of complexity; Bonner & Sprinkle, 2002). Therefore, explicit rewards have been shown to have a particularly negative influence on performance in complex jobs (see Bonner, Hastie, Sprinkle, & Young, 2000; Gagné & Deci, 2005 for an overview). The positive effect of incentives on performance as found in meta-analyses is probably due to an overrepresentation of low complexity tasks in the reviewed research (Stajkovic & Luthans, 2003).

**Hypothesis 8.** *The hypothesized relations are stronger when there is more information asymmetry.*

#### 4.2.5 Control variables

The control variables that we used in our study are: sex, age, educational level and departmental tenure of the employee, and delegation. The employee variables are included, because they may give rise to alternative explanations for *employee job performance* (cf. Ali & Davies, 2003). Delegation (of decision rights) is a variable that is traditionally seen as one of the three primary components of organizational design, together with *PM quality* and *using PMs for incentives* (Widener, Shackell, & Demers, 2008). These three variables are supposed to be complementary to each other and therefore delegation is expected to be positively related to *PM quality* and *using PMs for incentives* (e.g. Ortega, 2009; Widener, et al., 2008). Furthermore, organizational behavior literature supposes delegation to be positively related to performance since it is a form of autonomy and it thus increases autonomous motivation (Deci & Ryan, 2000). Section 4.2.3 discussed how autonomous motivation in turn leads to *employee job performance*.

In the accounting literature, delegation is often operationalized by asking respondents: who has the decision-making authority with respect to the development of new products, hiring and firing of personnel, selection of large investments, budget allocations, and pricing decisions? (i.e. Abernethy, Bouwens, & Van Lent, 2004; Gordon & Narayanan, 1984; Moers, 2006; Nagar, 2002). At lower organizational levels this operationalization does not seem applicable. Hence we turned to an operationalization found in the organizational behavior literature, in which delegation is seen as a feeling of professional freedom and in which it is defined as giving employees the freedom and right to decide and act on one's own (Mills & Ungson, 2003). For completeness, we use this operationalization as the delegation control variable, although we did not have any prior expectations this operationalization at lower organizational levels is related to the variables in our model.

### 4.3 Method

Since we were interested in answering our research question for a broad population, we used a survey method. Surveys can be used to collect large-scale, high quality data if they are properly constructed and administered. To make sure that the present survey was indeed properly carried out, we employed the framework used by Van der Stede et al. to assess the quality of survey research published in management accounting journals from 1982-2001 (Van der Stede, Young, & Chen, 2005). This framework divides

the requirements for survey research into five categories. First of all, researchers should have a specific research objective in mind to be able to design the research accordingly, which we reported mainly in Section 4.1. Second, researchers should define their population and should be clear about their sample to be able to know what inferences can be drawn from the study (see Section 4.3.1 and 4.3.2). The third category of requirements takes survey questions and other research method issues that are necessary to judge the internal validity of the study into consideration (see Section 4.3.3). Fourth, data should be accurate (so we describe the practical procedures followed to gather the data in Section 4.3.1 and report how we checked for problems in the data in Footnote 6). And fifth, researchers should accurately report how they ensured to meet these requirements. Therefore this section discusses in detail the methods we used.

### 4.3.1 Sample selection and data collection

Our survey was conducted in the Netherlands. Respondents had to meet three criteria: (1) the nonmanagerial employees had to be professionals or members of staff who carry out the work; (2) they must have worked in their current function for at least one year; (3) the supervisory managers had to use performance measures to measure their employees' performance. Locating all the people in the Netherlands who meet these characteristics is impossible, so we used snowball sampling. This involves asking every potential respondent for contact details of other people that meet the criteria. Snowball sampling is the best sampling method if it is impossible to use standard sampling methods, because it is asymptotically unbiased; independent of one's starting point (Salganik & Heckathorn, 2004). In line with that, earlier research involving similar constructs to the ones here showed that the results of studies with random versus non-random samples are comparable (Derfuss, 2009).

We began our search for respondents by contacting people from our own network, including several organizations that sent our request to a large number of people; mainly by email. Moreover, we collaborated with two professional associations by organizing two seminars about "developing useful performance measures." The seminar participants completed the survey in advance, making the seminar more relevant for their own situation. We also published papers in three Dutch professional journals about how to develop performance measures together with employees, in which we recommended readers to complete the survey if they wanted to know whether or not this approach would be relevant to them.

We promised a free copy of the research report to research participants, which contained their personal scores and the averages of other

organizations to benchmark their scores. And finally, we promised that every respondent would be invited for a seminar during which their experience with performance measurement could be exchanged and recommendations would be given based on the results of our earlier scientific research.

We used the following procedure to find pairs of respondents, comprising of an employee and their manager. Those employees who agreed to participate completed the online survey and provided us with their manager's contact details. The managers who agreed to respond to the survey, provided us with the contact details of one or more of their employees who met the criteria via an online tool. After one of them (randomly chosen by us) completed the survey, we contacted the manager again to also complete an online survey. We made it clear to every respondent that their answers would be treated as strictly confidential. They would only get a feedback report of their personal results and not of the results of the other half of their pair.

#### 4.3.2 Participants

Our survey was completed by 86 pairs of work floor employees/professionals and their superiors—whom we will call “employees” and “managers” respectively in the remainder of this chapter. This relatively low number of respondents is a consequence of the low number of Dutch organizations which to date have implemented a performance measurement system in their lower hierarchical levels. Many potential respondents answered that they were about to implement such a system, but had not yet been able to. Ideally one would want more data points when using structural equation modeling.<sup>3</sup> Yet if the population is restricted in size, structural equation modeling may also be applied to smaller samples (Kline, 2011, p. 12).

In total 21 employees and 74 managers indicated they met the inclusion criteria and that they wanted to complete the rest of the survey, potentially giving 95 pairs. All 21 employees completed the survey and 15 of their managers (65%).<sup>4</sup> For every manager that had wanted to take part in the survey, one of their randomly selected subordinate employees completed the survey. After these employees had finished their part of the survey, 71 of the 74 managers completed their particular part (96%). In total, we received data from 86 complete pairs (89%).

<sup>3</sup>With 6 latent variables and 21 indicators a sample size of at least 138 is recommended (Westland, 2010).

<sup>4</sup>Two of the non-responding managers had only completed the questions on employee job performance.

The survey's respondents work in line positions within various organizations in the Netherlands. They have all been working in their current function for at least one year, and all the managers use performance measures to assess their employee's performance. Table 4.1 gives an overview of the characteristics of the respondents.

**Table 4.1** Respondent characteristics

Characteristic		Employee	Manager
Sex	% male	73	88
	% female	27	12
Education	% lower	9	4
	% intermediate	29	17
	% higher	35	49
	% scientific	27	30
Age	mean (SD)	39 (9.7)	45 (6.8)
Departmental tenure	mean (SD)	6.2 (6.2)	7.8 (6.2)
Span of control	mean (SD)	N/A	35 (52)
# Employees in organization	mean (SD)	5706 (23748)	
organization		min. 7; max. 150000	

### 4.3.3 Survey instrument

After developing the first version of the survey, we pre-tested it among 17 respondents who had similar characteristics to the employees of the population (cf. Anderson & Gerbing, 1991). We used several methods for the pretest. First, we used Anderson and Gerbing's (1991) item-sort task to determine how well the items measured the constructs. After that, we used Hak et al.'s Three-Step Test-Interview method to find out more about the respondents' actual response behavior (Hak, Van der Veer, & Jansen, 2008). Participants were asked to complete the survey and at the same time say aloud what they were thinking. As a third source, we also analyzed the resulting survey data based on Cronbach's alpha and principal component analyses. These three sources provided triangulated data which helped us to shorten the survey and they suggested we were using valid measures.

The items used to measure the constructs of the main study are shown in Appendix A. Respondents had to rate all items on a 7-point fully anchored Likert scale: (1) Totally disagree, (2) Disagree, (3) Moderately disagree, (4) Neutral, (5) Moderately agree, (6) Agree, (7) Totally agree. All the items were in Dutch.

We tried to prevent common method bias in several ways by following the guidelines of Podsakoff, MacKenzie, Lee and Podsakoff (2003). First of all, each survey page only contained the items concerning one construct that was introduced briefly. This increases the quality of the data, because it helps the respondents to understand the items better (Frantom, Green, & Lam, 2002). Furthermore, we measured the constructs in a different order than the order of the model, we emphasized the confidentiality of the answers, and we carefully constructed and pretested the scale items. We also statistically controlled for common method bias by adding a latent common method factor to our model (Podsakoff, et al., 2003).

Surveys were completed by both employees and their managers. Employees completed the questions regarding *PM participation*. Managers completed the questions regarding *PM quality, using PMs for incentives, employee job performance* and *information asymmetry*. The here reported survey items were part of a larger survey that did not only try to answer the research question from the viewpoint of the manager, but also from that of the employee.

***PM participation.*** *PM participation* is measured by the Abernethy and Bouwens's (2005) "influence on the system design" scale. It measures the extent of the influence employees feel to have had on the design of the performance measures used to measure their performance. It consisted of the five items shown in Appendix A. Cronbach's alpha is .94.

We allowed for covariance of the error terms of the items "I have/had influence on ongoing modifications to the design of the performance measures" and "I have/had influence on the maintenance of the performance measures" in the measurement and structural model because, especially in the Dutch language, the two items are very similar. They both deal with adjusting the performance measures when they are already in use.

***PM quality.*** *PM quality* is measured with a scale that was inspired by Moers's (2006) "performance measurement properties" scales. It measures the extent to which managers find the performance measures sensitive to the actions of their employees, how precise the performance measures are in measuring relevant aspects of their employees' performance, and whether they are verifiable (Moers, 2006). To make the scale relevant for non-managerial employees, we added and deleted some items to the original scale based on the pretest.

A varimax rotated principal component analysis of the final data gave three factors. One consisted of the four recoded negatively formulated items. We decided to delete these four items because we were not convinced of their validity. Another factor consisted of three items, all of



which have a meaning similar to “making more of an effort in his/her job leads to better performance on the performance measures.” On hindsight, this did not fit in with our meaning of *PM quality*. These items deal with employee input while performance measures should deal with the output of employees. Thus we deleted these three items as well. *PM quality* was measured with the remaining four items (also used in Chapter 3 which, we are convinced, validly measure what we consider to be *PM quality*. Cronbach’s alpha for these items is .72.

**Using PMs for incentives.** *Using PMs for monetary compensation, nonmonetary rewards and evaluation purposes* are measured by Moers’s (2006) three subscales for using performance measures for incentive purposes. The first two are measured with two items and the latter with three. Originally, Moers measured *using PMs for evaluation purposes* with four items. Yet the pretest indicated that this fourth item fitted *PM quality* better, and when analyzed with the final data, it showed that its factor loading was lower than .40, so we decided to exclude this fourth item. The Cronbach’s alpha is .84 for *using PMs for monetary compensation*, .88 for *using PMs for nonmonetary rewards* and .89 for *using PMs for evaluation purposes*. Because the three types of incentives distinguished here usually go hand in hand with each other (an example is someone who gets a raise because of a promotion), we allowed the error terms of both latent variables to covary, so that only their unique variance is used to predict *employee job performance*.

**Employee job performance.** *Employee job performance* was measured with a scale that was originally developed by Williams (see Williams & Anderson, 1991), and later revised and shortened by Podsakoff and MacKenzie (1989). It measures the extent to which employees meet their job requirements according to their manager. This is consistent with our definition of *employee job performance*. It considers job performance in general and from the perspective of the manager. We believe this scale is relevant in our study since increasing the extent to which employees meet their job requirements is also the behavior that performance measures usually intend to stimulate (Williams & Anderson, 1991). Moreover, the scale is broadly applicable, which is important because our population exists of employees in all kinds of jobs and industries. The scale has been shown to correlate highly with objective measures of performance (Burney, Henle, & Widener, 2009). The Cronbach’s alpha is .91.

**Information asymmetry.** *Information asymmetry* is defined as the amount of specific knowledge held by employees in comparison to their manager. It is measured with Dunk’s (1993) scale, which is often used in management accounting research. *Information asymmetry* is usually measured at the

level of the agent, because theoretically the superior may not be aware of the existing extent of *information asymmetry*. At the same time, it would be interesting to measure *information asymmetry* at the superior as well, because eventually it is the superior who makes the decision to involve subordinates in developing performance measures and to use them for incentive purposes (partly based on their assessment of the amount of *information asymmetry*). Therefore, we measure *information asymmetry* at both the employees and their managers, and we perform two sets of analyses to see if the results are comparable. As will be explained in Section 4.3.4 we used a median split to examine the moderating influence of *information asymmetry* on all relations in the model.<sup>5</sup> The reliability of the *information asymmetry* scale seems sufficient (Cronbach's alpha is .93 for the scale completed by employees and .89 for the scale completed by managers).

**Delegation.** The control variable "delegation" was measured with five of the six items of the scale that was developed by Thomas and Tymon (1993). We deleted the item "I make my own choices without being told by management" because this item severely reduced model fit. In hindsight, we think the Dutch version of this item may be misread as: "although I have no freedom in my work, I will create this freedom myself." However, what we mean is that management gives employees the freedom to make their own choices without consulting managers.

#### 4.3.4 Statistical analyses

Hypotheses 1-7 were tested simultaneously with structural equation modeling using maximum likelihood estimation with AMOS 18. Other research in management accounting often makes use of partial least squares rather than the full information covariance based analysis, as used here (e.g. Chapman & Kihn, 2009; M. Hall, 2008; Hartmann & Slapnicar, 2009). Partial least squares can be useful "for causal-predictive analysis in situations of high complexity but low theoretical information" (Joreskog & Wold, 1982, p. 270 as cited by Anderson & Gerbing, 1988). The current study has formal hypotheses based on ample theory and our goal is to test these hypotheses. Covariance based analyses are more suitable for theory testing, mainly because they only explain variance that is of theoretical interest and because they provide an overall test of model fit (Anderson & Gerbing, 1988).

<sup>5</sup> The average score on the individual items of the information asymmetry scale was used for each respondent. The mean score was 4.68 (SD = 1.39; median = 5.00) for employees and 4.85 (SD = 1.31; median = 5.08) for managers. After the median split based on the employee scores the means of the two groups were 3.59 (SD = 1.08) and 5.77 (SD = 0.55) respectively. After the median split based on the employee scores the means of the two groups were 3.79 (SD = 0.96) and 5.90 (SD = 0.53) respectively.

We used Anderson and Gerbing's (1988) two-step modeling approach making it relatively easy to locate the source of poor fit. Moreover, it enabled the detection of interpretational confounding (Burt, 1976), which means that the empirical definitions of the constructs (factor loadings) change depending on the structural model (Kline, 2011).

After the data set had been screened for problems (Kline, 2011, pp. 51-68)<sup>6</sup>, the two-step approach was applied. The first step consisted of a confirmatory factor analysis to estimate the fit of the measurement model. This means that all the items in the measurement model are only allowed to load on their intended factor, and the factors are allowed to freely correlate with each other. Once the measurement model is adequate, the second step is to analyze the structural model. Model fit is assessed with several model fit indices. First of all, we used chi-square and we assessed robustness of the chi-square model fit using the Bollen-Stine bootstrap with 999 bootstrap samples. Since the chi-square test of fit is sensitive to sample size, we also used other fit indices to check the model fit (Bentler, 1990). Schreiber et al. (2006) recommend CFI, TLI and RMSEA for one-time analyses; i.e. if no model comparisons of non-nested models are made. CFI and TLI are sufficient if they are around .95 and the higher they are, the better, and RMSEA should be lower than .08 (Hu & Bentler, 1999). We used maximum likelihood bootstrapping, with 999 bootstrap samples and percentile and bias-corrected confidence intervals set to 95%, to assess robustness of the found significance levels of the path coefficients and to estimate significance levels for the indirect effects.

After testing Hypotheses 1-7, the moderating influence of *information asymmetry* on each of these relations (Hypothesis 8) was tested using multiple group analysis. Two groups of less versus more information asymmetry were made using a median split (see Section 4.3.3 and Footnote 4). We used multiple group analyses rather than latent variable interactions because the structural model is too large with all the interactions and there were too many interactions to be able to estimate it (Muthén & Muthén, 2010), especially with this sample size (Algina & Moulder, 2001; Schumacker, 2002). Therefore, we chose to use multiple group analyses, as its only disadvantage in this particular study is a decrease in statistical power due to the use of only half of the sample and the discarding of information by dichotomizing a continuous variable (Edwards & Lambert, 2007).

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<sup>6</sup>We checked for collinearity, outliers, missing data and normality. We found no extreme collinearity, no outliers ( $p < .001$ ), no missing data (except for the control variable "education") and no univariate nonnormality. Yet we did find multivariate kurtosis, so we used bootstrapping as a robustness check to be sure that this did not influence our results (Kline, 2011, pp. 177).

To be able to assess if the relations are moderated by *information asymmetry* (Hypothesis 8) we first needed to check if the measurement model is invariant between groups of high versus low informational asymmetry. If it is, one may constrain the measurement model to be equal across groups, which is necessary for comparing the regression weights of the two groups. Significance in differences in the regression weights was assessed using the critical ratios for differences between parameters (Arbuckle, 2009).<sup>7</sup>

## 4.4 Results

### 4.4.1 Hypotheses testing (Hypotheses 1-7)

We first tested Hypotheses 1-7 with a model in which all the variables were included except for *information asymmetry*. The confirmatory factor analysis shows that the measurement model fits well ( $\chi^2=202.64$ ,  $df=173$ ,  $p=.06$ , Bollen-Stine  $p=.612$ ; TLI=.969; CFI=.975; RMSEA=.045). Table 4.2 shows the descriptive statistics of the items and the factor loadings of the measurement model. Construct correlations are shown in Table 4.3.

The structural model used to test Hypotheses 1-7 also fits very well ( $\chi^2=203.45$ ,  $df=178$ ,  $p=.09$ , Bollen-Stine  $p=.656$ ; TLI=.974; CFI=.978; RMSEA=.041). Figure 4.2 shows the standardized regression weight estimates for the hypothesized relations.<sup>8</sup> Since we had contradicting hypotheses for Hypotheses 5 and 6, we used two-tailed significance levels for testing these hypotheses and one-tailed significance levels for the other hypotheses. The model supports Hypotheses 1-4 and 7. The significance levels are the same after doing a maximum likelihood bootstrap with 1999 samples except for the relation between *using PMs for monetary compensation* and *employee job performance*, for which the two-tailed significance is then  $<.05$ ; supporting Hypotheses 1-4, 5b and 7. The indirect effect of *PM participation* on *employee job performance* via *PM quality* and *using PMs for incentives* is significant ( $p<.10$ ).

<sup>7</sup> Critical ratios can be used to find pairs of parameters that do not differ significantly from each other (Arbuckle, 2009) and can thus be used to reject our hypotheses. Another way of finding out whether paths differ significantly between groups is to compare model fit between the models with and without that particular path being constrained to be equal (Byrne, 2010). Statistically, this is the same as the method we used. "The square of the critical ratio for differences between parameters is approximately the amount by which the chi-square statistic would increase if the two parameters were set equal to each other" (Arbuckle, 2009, p. 113).

<sup>8</sup> The factor loadings of the items are the same as in the measurement model (Table 4.1) and the error terms of the constructs *using PMs for monetary compensation*, *using PMs for nonmonetary rewards* and *using PMs for evaluation purposes* are allowed to covary, so that only their unique variance is used to predict employee job performance.

**Table 4.2** Descriptive statistics and factor loadings of the measurement model

Latent variables	$\alpha$	N	M	SD	Min	Max	Standardized factor loadings <sup>a</sup>	Un-standardized factor loadings <sup>a</sup>
PM participation	0.94							
Item 1		86	3.48	1.97	1	7	0.90	1.00 ***
Item 2		86	3.58	1.86	1	7	0.88	0.93 ***
Item 3 <sup>b</sup>		86	3.42	1.79	1	7	0.81	0.81 ***
Item 4		86	3.20	1.70	1	7	0.91	0.88 ***
Item 5 <sup>b</sup>		86	3.45	1.76	1	7	0.84	0.83 ***
PM quality	0.72							
Item 6		86	4.48	1.55	1	7	0.45	1.00 ***
Item 7		86	4.53	1.35	1	7	0.85	1.64 ***
Item 8		86	5.22	1.26	1	7	0.76	1.37 ***
Item 9		86	5.10	1.28	1	7	0.55	1.01 ***
Using PMs for monetary compensation	0.84							
Item 10		86	4.74	1.63	1	7	0.91	1.00 ***
Item 11		86	4.84	1.84	1	7	0.81	1.00 ***
Using PMs for nonmonetary rewards	0.88							
Item 12		86	4.70	1.70	1	7	0.95	1.00 ***
Item 13		86	4.80	1.61	1	7	0.83	0.83 ***
Using PMs for evaluation purposes	0.89							
Item 14		86	5.28	1.06	1	7	0.86	1.00 ***
Item 15		86	5.37	1.21	1	7	0.95	1.26 ***
Item 16		86	5.10	1.11	1	7	0.74	0.90 ***
Employee job performance	0.91							
Item 17		86	6.03	0.99	2	7	0.75	1.00 ***
Item 18		86	5.72	1.10	2	7	0.89	1.32 ***
Item 19		86	5.49	1.12	2	7	0.83	1.26 ***
Item 20		86	5.50	1.00	2	7	0.85	1.16 ***
Item 21		86	5.35	1.17	2	7	0.78	1.23 ***

\*\*\* $p < .001$ <sup>a</sup>Only the estimated factor loadings are shown in the tables. The loadings of the measures on all other constructs (than the one the measure is posited to indicate) are set to zero.<sup>b</sup>The error terms of these two items were allowed to covary:  $r = .400^{**}$

**Table 4.3** Construct variances (in parentheses on the diagonal axis) and correlations

Item	1	2	3	4	5	6	7	8	9	10	11	12	13
1 PM participation	(3.08) ***												
2 PM quality	0.24 + (0.49) *												
3 Using PMs for monetary	0.15	0.57 ** (2.16) ***											
4 Using PMs for nonmonetary rewards	0.16	0.44 ** (2.56) ***	0.64 *** (2.56) ***										
5 Using PMs for evaluation purposes	0.20 +	0.69 ** (0.82) ***	0.71 *** (0.82) ***	0.59 *** (0.82) ***									
6 Employee job performance	0.04	0.17	0.00	0.09	0.19 (0.54) ***								
7 Information asymmetry (employees)	-0.08	0.04	0.11	0.09	-0.01	0.12 (1.77) ***							
8 Information asymmetry (managers)	0.11	0.17	0.22 +	0.46 *** (1.51) ***	0.26 *	0.37 ** (1.51) ***	0.38 ** (1.51) ***						
9 Sex <sup>a</sup>	0.03	0.12	-0.03	0.12	0.17	0.29 * (0.20) ***	-0.17	0.12	(0.20) ***				
10 Education <sup>b</sup>	-0.09	0.05	0.14	0.13	0.27 *	0.23 + (2.60) ***	0.40 ** (2.60) ***	0.37 ** (2.60) ***	0.14 (2.60) ***				
11 Age	0.05	-0.20	-0.28 *	-0.07	-0.15	-0.07	0.187	0.04	-0.16 (93.0) ***	-0.18			
12 Departmental tenure	0.04	-0.05	-0.19	-0.06	-0.11	-0.01	0.08	-0.06	-0.19 + (37.7) ***	-0.19 + (37.7) ***	0.30 ** (37.7) ***		
13 Delegation	0.15	0.01	0.13	0.15	-0.01	0.17	0.324 * (0.85) ***	0.23 + (0.85) ***	-0.01 (0.85) ***	0.15 (0.85) ***	-0.04 (0.85) ***	0.05 (0.85) ***	(0.85) ***

\*\*\*p<.001; \*\*p<.01; \*p<.05; †p<.10; p-values are two-tailed and were assessed using unstandardized estimates

<sup>a</sup>1 = male; 2 = female

<sup>b</sup>1 = lower vocational education; 2 = intermediate general education; 3 = intermediate vocational education; 4 = higher general education;

5 = higher vocational education; 6 = scientific education

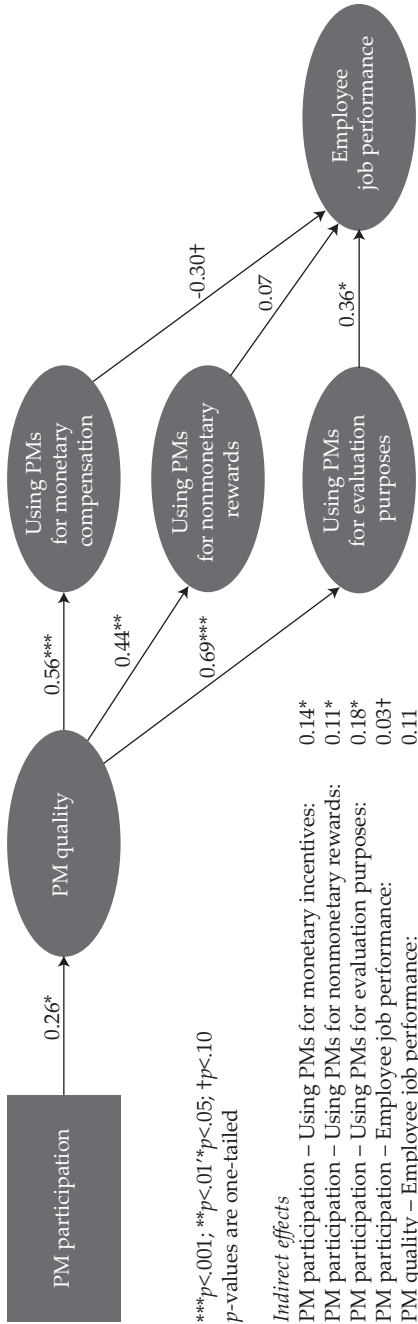


Figure 4.2 Standardized path coefficients for the structural model

#### 4.4.2 Additional checks

The error terms of the three “using PMs for incentives” variables correlate strongly with each other ( $r_{\text{error monetary, error nonmonetary}} = .53, p < .001$ ;  $r_{\text{error monetary, error evaluation}} = .53, p < .01$ ;  $r_{\text{error nonmonetary, error evaluation}} = .44, p < .01$ ). These correlation coefficients can be an indication of collinearity. Even though the collinearity is not extreme (cf. Kline, 2011, p. 53), we checked to see if the results hold when a remedy for extreme collinearity is applied. Kline mentions two basic ways to deal with extreme collinearity: “eliminate variables or combine redundant ones into a composite” (Kline, 2011, p. 54). The latter would diminish the theoretical contribution of the model, so we chose to only apply the suggestion to eliminate variables by separately estimating the models for each of the three variables (Model 2-4 in Table 4.4). All the models have a good model fit and the significance levels for the relations are similar to those of the overall model.

We also added the control variables that we mentioned in Section 4.2.5 to our analyses. As set out in that section, we controlled all the dependent variables for delegation, and we controlled *employee job performance* for sex, age, educational level and tenure. The results that are given in Model 5 of Table 4.4 show that the strength of the relations are similar to those of the main model, except for the relation between *using PMs for evaluation purposes* and *employee job performance* (Hypothesis 7) which is slightly weaker.

As mentioned in Section 4.3.3 we tried to prevent common method bias in several ways. Yet in spite of all these remedies, common method variance can still be present and can provide an alternative explanation for the found relations. Therefore we also statistically checked for common method bias. We did that by adding a latent common method factor that is estimated from the items that are hypothesized to be related to each other and are measured at a single source (Podsakoff, et al., 2003). In the current model, this leads to the following three latent common method variables: (1) *PM quality, using PMs for monetary compensation and employee job performance*; (2) *PM quality, using PMs for nonmonetary rewards and employee job performance*; and (3) *PM quality, using PMs for evaluation purposes and employee job performance*. To reduce the number of estimation points per analysis, we estimated the model three times, each time adding another latent common method variable. The results of these analyses in Table 4.5 show that although the significance levels differ somewhat, the substantive conclusions remain unchanged.

Our sample size was rather small to conduct a structural equation analysis with so many estimation points. Therefore, as a last check, we also performed a path analysis in which we used scale scores instead



Table 4.4 Standardized regression weights, direct effects and model fit

Independent variable	Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Beta coefficients (=standardized direct effects)</i>						
H1	PM participation	PM quality	0.26 *	0.26 *	0.26 *	0.26 *
H2	PM quality	Using PMs for monetary compensation	0.56 ***	0.54 ***		0.56 ***
H3	PM quality	Using PMs for nonmonetary rewards	0.44 **	0.41 **		0.43 **
H4	PM quality	Using PMs for evaluation purposes	0.69 ***		0.71 ***	0.69 ***
H5	Using PMs for monetary compensation	Employee job performance	-0.30 †	0.01		-0.23
H6	Using PMs for nonmonetary rewards	Employee job performance	0.07	0.09		0.01
H7	Using PMs for evaluation purposes	Employee job performance	0.36 *		0.20 *	0.28 †
control	Delegation	PM quality				-0.02
control	Delegation	Using PMs for monetary compensation				0.13
control	Delegation	Using PMs for nonmonetary rewards				0.14
control	Delegation	Using PMs for evaluation purposes				-0.01
control	Delegation	Employee job performance				0.18 †
control	Sex employee	Employee job performance				0.25 *
control	Age employee	Employee job performance				-0.03
control	Education level employee	Employee job performance				0.11
control	Departmental tenure employee	Employee job performance				0.06

\*\*\*,  $p < .001$ ; \*\*,  $p < .01$ ; \*,  $p < .05$ ; †,  $p < .10$ ;  $p$ -values are one-tailed

Table 4.4 continued

Independent variable	Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Standardized indirect effects</i>						
PM participation	Using PMs for monetary compensation	0.14 *	0.14 *			N/A <sup>a</sup>
PM participation	Using PMs for nonmonetary rewards	0.11 *		0.11 *		N/A <sup>a</sup>
PM participation	Using PMs for evaluation purposes	0.18 *			0.18 *	N/A <sup>a</sup>
PM participation	Employee job performance	0.03 †	0.00	0.01	0.04 *	N/A <sup>a</sup>
PM quality	Employee job performance	0.11	0.01	0.04	0.14 †	N/A <sup>a</sup>
<i>Model fit indices</i>						
	$\chi^2$	203.45	111.35	98.22	134.26	475.31
	<i>df</i>	178	100	100	115	374
	<i>p</i>	0.090	0.206	0.532	0.106	0.000
	CFI	0.978	0.986	1.000	0.980	0.926
	TLI	0.974	0.984	1.003	0.976	0.907
	RMSEA	0.041	0.037	0.000	0.044	0.056

<sup>a</sup>Because of missing values bootstrapping was not possible

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; † $p < .10$ ; *p*-values are one-tailed

Table 4.5 Standardized regression weights and model fit: The three models including a method factor<sup>a</sup> give almost identical results to the earlier model

Independent variable	Dependent variable	Main model			Main model		
		incl. method factor 1 <sup>a</sup>	incl. method factor 2 <sup>a</sup>	incl. method factor 3 <sup>a</sup>	incl. method factor 1 <sup>a</sup>	incl. method factor 2 <sup>a</sup>	incl. method factor 3 <sup>a</sup>
<i>Beta coefficients (=standardized direct effects)</i>							
H1	PM participation	0.26 *	0.31 *	0.25 *	0.23 *		
H2	PM quality	0.56 ***	0.49 *	0.56 ***	0.55 ***		
H3	PM quality	0.44 **	0.45 *	0.43 **	0.39 **		
H4	PM quality	0.68 ***	0.72 *	0.67 ***	0.54 **		
H5	Using PMs for monetary compensation	-0.30 †	-0.32 †	-0.30 †	-0.24		
H6	Using PMs for nonmonetary rewards	0.07	0.08	-0.08	0.07		
H7	Using PMs for evaluation purposes	0.36 *	0.38 *	0.41 *	0.25 †		
<i>Model fit indices</i>							
	$\chi^2$	203.45	186.26	188.11	180.62		
	<i>df</i>	178	168 <sup>b</sup>	168 <sup>b</sup>	166		
	<i>P</i>	0.090	0.159	0.137	0.207		
	CFI	0.978	0.984	0.983	0.988		
	TLI	0.974	0.981	0.979	0.984		
	RMSEA	0.041	0.036	0.038	0.032		

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; † $p < .10$ ;  $p$ -values are one-tailed

<sup>a</sup>Method factor 1 includes the items of *PM quality*, using *PMs for monetary compensation* and *employee job performance*;

Method factor 2 includes the items of *PM quality*, using *PMs for nonmonetary rewards* and *employee job performance*;

Method factor 3 includes the items of *PM quality*, using *PMs for evaluation purposes* and *employee job performance*

<sup>b</sup>One of the error terms had a negative variance. We solved this following the guidelines of Chen et al. (2001) by eventually constraining the variance of that error term to zero.

of item scores to measure the constructs. The sample can be smaller when using a path analysis because it has less estimation points than a structural analysis (since it does not require estimating the relationships between the constructs and the items). We calculated the scale scores using the principal component method with PASW statistics 18, thus the scale scores we used are in fact “factor regression scores<sup>9</sup>.” Again, the results are similar. The model has an extremely good fit ( $\chi^2=1.52$ ,  $df=5$ ,  $p=.91$ ; TLI=1.095; CFI=1.000; RMSEA=.000) and the significance levels are similar to the ones of the original model (H1:  $\beta=.19$ ,  $p<.05$ ; H2:  $\beta=.45$ ,  $p<.001$ ; H3:  $\beta=.35$ ,  $p<.001$ ; H4:  $\beta=.61$ ,  $p<.001$ ; H5:  $\beta=-.13$ , n.s.; H6:  $\beta=.05$ , n.s.; H7:  $\beta=.23$ ,  $p<.05$ ).

**Conclusion**—All additional checks support our initial findings. Altogether this strongly supports the idea that *PM participation* is related to *employee job performance* via *PM quality* and *using PMs for evaluation purposes*.

#### 4.4.3 Moderation of information asymmetry (Hypothesis 8)

Hypothesis 8 was tested by comparing the models of less and more information asymmetry. We first needed to check if the measurement model is invariant between groups of high versus low *information asymmetry*. This is done by comparing three different configurations of the measurement model: one that estimates all parameters independently across groups; one that constrains the factor loadings of both groups to be equal; and one that also constrains the measurement intercepts of both groups to be equal. The comparisons indicate that the respondents of both groups employed similar conceptual frames of reference with regard to the constructs measured and that we can assume both the factor loadings and measurement intercepts are equal across groups of high versus low informational asymmetry (Vandenberg & Lance, 2000).<sup>10</sup> This is necessary when comparing the regression weights of the two groups.

<sup>9</sup> Factor regression scores always have a mean of 0 and a standard deviation of 1, and they are used to maximize validity, i.e. this procedure provides the highest correlations between a factor score and the corresponding factor (DiStefano, Zhu, & Mindriliă, 2009).

<sup>10</sup> Not all model fit indices of the unconstrained model are good enough ( $\chi^2=457.94$ ,  $df=346$ ,  $p=.00$ , Bollen-Stine  $p=.890$ ; CFI=.911; TLI=.892; RMSEA=.062 for *information asymmetry* measured at employees;  $\chi^2=479.27$ ,  $df=346$ ,  $p=.00$ , Bollen-Stine  $p=.864$ ; CFI=.894; TLI=.871; RMSEA=.068 for *information asymmetry* measured at managers). But since no theoretically sound modifications are possible, we decided to proceed with our analyses based on the acceptable Bollen-stine  $p$  and RMSEA. Hence we assumed that the factor structure is equal across groups. Because the invariant factor loadings ( $\chi^2=477.93$ ,  $df=361$ ,  $p=.00$ ; Bollen-Stine  $p=.894$ ; CFI=.907; TLI=.892; RMSEA=.062;  $\Delta\chi^2=19.99$ ,  $\Delta df=15$ ,  $p_{\Delta\chi^2}=.17$  for *information asymmetry* measured at employees;  $\chi^2=495.99$ ,  $df=361$ ,  $p=.00$ ; Bollen-Stine  $p=.875$ ; CFI=.892; TLI=.875; RMSEA=.067;  $\Delta\chi^2=16.72$ ,  $\Delta df=15$ ,  $p_{\Delta\chi^2}=.34$  for *information asymmetry* measured at managers) and measurement intercepts models ( $\chi^2=492.77$ ,  $df=382$ ,  $p=.00$ ; Bollen-Stine  $p=.896$ ; CFI=.912; TLI=.903; RMSEA=.059;  $\Delta\chi^2=34.77$ ,  $\Delta df=36$ ,  $p_{\Delta\chi^2}=.53$  for *information asymmetry* measured at employees;  $\chi^2=529.09$ ,  $df=382$ ,  $p=.00$ ; Bollen-Stine  $p=.849$ ; CFI=.883; TLI=.871; RMSEA=.068;  $\Delta\chi^2=49.82$ ,  $\Delta df=36$ ,  $p_{\Delta\chi^2}=.06$  for *information asymmetry* measured at managers) do not differ significantly from the unconstrained model, we can assume that they are equal across groups as well.

Differences in regression weights are estimated by running a multiple group analysis for the structural model in which the factor loadings and measurement intercepts are constrained to be equal across groups. The model fit of the structural model with *information asymmetry* measured at the employee is sufficient ( $\chi^2=496.28$ ,  $df=392$ ,  $p=.00$ ; TLI=.911; CFI=.917; RMSEA=.056); the model fit of the structural model with *information asymmetry* measured at the manager is a bit less good ( $\chi^2=538.25$ ,  $df=392$ ,  $p=.00$ ; TLI=.875; CFI=.883; RMSEA=.067).

After a median split, the sample size per group is only 43, so the small sample size may be problematic in this multiple group analysis. Therefore, we performed the analysis again for a path model in which the constructs are represented by factor regression scores instead of several items scores. In that case both the model with *information asymmetry* measured at employees and the one measured at managers fit very well ( $\chi^2=4.868$ ,  $df=10$ ,  $p=.90$ ; TLI=1.132; CFI=1.000; RMSEA=.000 for employees and  $\chi^2=3.319$ ,  $df=10$ ,  $p=.97$ ; TLI=1.203; CFI=1.000; RMSEA=.000 for managers).

Table 4.6 shows the standardized estimated regression weights for the hypothesized relations of the two groups as well as critical ratios for differences between the regression weights of both the structural model and the path model. The few significant moderation effects we find are contrary to the hypotheses: *information asymmetry* measured at managers negatively moderates the *PM participation–PM quality* and *PM quality–using PMs for evaluation purposes* relations. Since the found effects were in the opposite direction as the hypotheses, we should look at the two-tailed significance levels. In that case, only the moderation of *information asymmetry* on the relation between *PM participation* and *PM quality* (with *information asymmetry* measured at managers) remains significant.

**Conclusion**—No support is found for our hypothesis that the relations in Hypotheses 1-7 are stronger if there is more *information asymmetry* compared to less *information asymmetry*. On the contrary, we find a significant weaker relation between *PM participation* and *PM quality* when there is more *information asymmetry* according to the manager.

## 4.5 Discussion

This study investigates the relation between letting work-floor employees participate in developing performance measures and *employee job performance*. The question is approached from the perspective of supervisory managers who use performance measures to assess the

**Table 4.6** Standardized regression weights and critical ratios for the difference between the two groups of more and less information asymmetry assuming equal factor loadings and measurement intercepts

Hypothesized relation	Less info. asym.		More info. asym.		Critical ratio for the difference		Less info. asym.		More info. asym.		Critical ratio for the difference	
	Less info. asym.	More info. asym.	Less info. asym.	More info. asym.	Critical ratio for the difference	Critical ratio for the difference	Less info. asym.	More info. asym.	Less info. asym.	More info. asym.	Critical ratio for the difference	Critical ratio for the difference
<i>Results for information asymmetry measured at employee</i>												
H1 PM participation - PM quality	0.40 <sup>**a</sup>	0.10	-1.20	0.36 <sup>**</sup>	0.05	1.50 <sup>†</sup>						
H2 PM quality - Using PMs for monetary compensation	0.52 <sup>**</sup>	0.60 <sup>***a</sup>	0.25	0.38 <sup>***a</sup>	0.51 <sup>***a</sup>	-0.59						
H3 PM quality - Using PMs for nonmonetary rewards	0.56 <sup>***a</sup>	0.37 <sup>*</sup>	-0.56	0.43 <sup>***</sup>	0.25 <sup>*</sup>	0.70						
H4 PM quality - Using PMs for evaluation purposes	0.70 <sup>***a</sup>	0.64 <sup>***a</sup>	-0.27	0.59 <sup>***a</sup>	0.61 <sup>***a</sup>	-0.20						
H5 Using PMs for monetary compensation - Employee job performance	-0.88	-0.22	0.66	-0.10	-0.17	0.12						
H6 Using PMs for nonmonetary rewards - Employee job performance	0.60	0.16	-0.49	0.04	0.12	-0.17						
H7 Using PMs for evaluation purposes - Employee job performance	0.26	0.55 <sup>**</sup>	0.36	0.02	0.49 <sup>***a</sup>	-1.40 <sup>†</sup>						
<i>Results for information asymmetry measured at manager</i>												
H1 PM participation - PM quality	0.45 <sup>**</sup>	-0.11	-2.19 <sup>*a</sup>	0.38 <sup>***a</sup>	-0.07	2.23 <sup>*a</sup>						
H2 PM quality - Using PMs for monetary compensation	0.52 <sup>***a</sup>	0.64 <sup>***a</sup>	0.73	0.47 <sup>***a</sup>	0.42 <sup>***a</sup>	0.27						
H3 PM quality - Using PMs for nonmonetary rewards	0.43 <sup>*a</sup>	0.53 <sup>***a</sup>	0.30	0.40 <sup>***a</sup>	0.28 <sup>*</sup>	0.60						
H4 PM quality - Using PMs for evaluation purposes	0.76 <sup>***a</sup>	0.49 <sup>*a</sup>	-1.69 <sup>*</sup>	0.68 <sup>***a</sup>	0.48 <sup>***a</sup>	1.96 <sup>*</sup>						
H5 Using PMs for monetary compensation - Employee job performance	-0.47	-0.22	0.92	-0.08	-0.21 <sup>†</sup>	0.19						
H6 Using PMs for nonmonetary rewards - Employee job performance	0.10	0.02	0.93	-0.11	0.13	-0.83						
H7 Using PMs for evaluation purposes - Employee job performance	0.44	0.60 <sup>***a</sup>	-0.09	0.17	0.43 <sup>***a</sup>	-0.65						

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ ; † $p < .10$ ;  $p$ -values are one-tailed

<sup>a</sup>two-tailed  $p$ -value is at the same significance level

performance of their employees. The results support our hypothesized relation between the amount of influence employees say they have had on the design of the performance measures (*PM participation*) and how the manager rates the quality of the performance measures (*PM quality*; Hypothesis 1). Moreover, as expected, *PM quality* is associated with the extent to which managers use the performance measures for monetary compensation, nonmonetary rewards, and evaluation purposes (Hypotheses 2-4). *Using PMs for monetary compensation and/or nonmonetary rewards* is not significantly related to *employee job performance* in our study, so Hypotheses 5 and 6 are not supported. Yet as expected, *using PMs for evaluation purposes* is positively related to *employee job performance* (Hypothesis 7). Finally, the hypothesized moderation effect of *information asymmetry* on all hypothesized relations is not supported by the data. A significant moderation effect of *information asymmetry* measured at the manager is found for the *PM participation–PM quality* relation; however in the opposite direction. The relation is weaker if the employees possess more job-relevant information.

#### 4.5.1 Theoretical implications

The results imply that *PM participation* is related to *employee job performance* via *PM quality* and by *using PMs for evaluation purposes*. Contrary to our expectations we find a non-significant moderation effect of *information asymmetry* on most of the relations. These findings may be explained by the fact that *information asymmetry* is probably already present in all kinds of manager–subordinate relations.

The finding that *PM participation* is related to *PM quality* as rated by the manager is important because only performance measures of high quality correctly reflect *employee job performance* and they thereby steer employees into the right direction (e.g. Abernethy, Bouwens, & Van Lent, 2004; Banker & Datar, 1989). Thus, it is important to create performance measures of high quality. Yet although the management accounting literature denotes *PM quality* to be important, little is known about how to develop high quality performance measures. This research shows *PM participation* of work-floor employees to be a way to increase *PM quality* in the mind of the manager and it therefore contributes to this literature. Future research may investigate other aspects which may increase *PM quality*.

This study also found that *PM participation* is related less to *PM quality* if there is more *information asymmetry* according to the managers. This finding is unexpected, because the reason for managers to involve employees in developing performance measures is to use the employees' job specific knowledge to improve the quality of the performance measures. We may

explain this unexpected finding in two ways: (1) Managers will not be able to identify themselves with performance measures that contain a lot of job-specific information they do not possess themselves and they may therefore view such performance measures as being of low quality (cf. Gravesteyn, Evers, Wilderom, & Molenveld, 2011). (2) If there is (too) much information asymmetry, it may give employees the opportunity to “game” the system (cf. Baiman & Evans, 1983; Christensen, 1982; Penno, 1984), “i.e., take actions that increase pay-outs from the incentive contract without improving actual performance” (Baker, 1992, p. 600). Because including the knowledge of employees in the performance measures is valuable, future research should investigate how under the condition of high information asymmetry between managers and work-floor employees the manager is willing to start a PM participation process.

With regard to the incentive practices included in this study, the results show that two widely used incentive practices (giving salary increases, bonuses and other monetary extras; and increasing employees’ chances of promotion and authority within the organization) had no significant effect on *employee job performance* in this study. This is consistent with many recent findings on the use of incentives, but contradicts with the traditional view in which incentives are per definition seen as motivators. As discussed in Section 4.2.3, concrete (monetary or non-monetary) incentives can have a negative influence on performance of employees who are already intrinsically motivated (Deci, et al., 1999; Falk & Kosfeld, 2006). This is important, because intrinsic motivation plays an growing part in employment contracts, due to people’s changing view on careers. Traditionally, careers are seen as a sequence of promotions along an organization’s hierarchy and employees were seeking to obtain greater extrinsic rewards within one organization (Rosenbaum, 1979). Yet today, it is less common to stay in the same organization throughout one’s whole career and individuals are increasingly seeking to fulfill their personal (often non-monetary) needs, thereby focusing on intrinsic rewards (Hall, 1996, 2004). In a survey among 13,000 respondents from nine European countries, Segers et al. found that 30% of respondents had such a new view on careers and acted in that way, whereas 22% still acted in the traditional way (the rest was something in between; Segers, Inceoglu, Vloeberghs, Bartram, & Henderickx, 2008). Since the sample of the current study was very broad, including employees from various jobs, organizations and industries, we assume that a similar division of career perspectives was present in our sample. Consequently, some people in our sample are motivated by monetary and non-monetary rewards, but others are not. These effects equal each other out, which may explain why



we did not find a significant relation between *using PMs for monetary and non-monetary rewards* and *employee job performance*.

Note that, although we predicted a (positive or negative) relation based on the agency and self-determination theories, our results do refine but not contradict any of these two theories. Both theories contain different key assumptions (agency theory assumes that the interests of the employee and the organization are different, whereas self-determination theory acknowledges they can also be the same), and given these assumptions the results are not inconsistent with these theories (cf. Kunz & Pfaff, 2002). Based on these assumptions and the literature of Section 4.2.3, we would probably find a positive relation between both of these incentive types and performance in a sample of employees whose self-interests differ from the interests of the organization. If the employees' self-interests were to resemble the organization's interests, the relation between both incentive types and performance would probably be negative (cf. Weibel, et al., 2010).

In sum, for ages monetary rewards have been seen as the main motivator of employees. Within the field of organizational behavior, this view has recently changed. Since intrinsic motivation is likely to become increasingly more important, we think it is time to extend the management accounting body of knowledge with this updated view on employee motivation as well. Much more research is necessary, for example to examine more moderators of the incentives–performance link, also at the higher organizational levels. Eventually such a stream of new research will give us more insights into how to motivate the employee of the 21st century.

#### 4.5.2 Limitations and suggestions for future research

The most obvious limitation of our study is the small sample size. As noted in Section 4.3.2 this was due to the low number of organizations which, to date, have implemented a performance measurement system in their lower hierarchical levels. We chose for this sample because we were convinced that *PM participation* is particularly relevant at lower organizational levels (see Section 4.1). Although structural equation modeling may be applied with smaller samples when the population is restricted in size (Kline, 2011, p. 12), the small sample size may have influenced our results. We tried to diminish the negative effects of the small sample size by performing many additional checks, as mentioned in Section 4.4.2, and these show the results are robust. Future research may project the hypotheses to employees in higher levels of the organization. Performance measurement is more common in these higher levels, so it might be easier to find respondents that meet the requirements.

Another limitation of our research was its cross-sectional design. Although the theory behind our model assumes a causal relationship, we cannot infer any causality before it has been tested with a longitudinal or experimental design. But a cross-sectional design also has advantages. Longitudinal studies, for example, usually have a larger (partial) nonresponse rate. Since sample size was already an issue in our study, a longitudinal design would probably have made it worse. Future research on this topic is more likely to succeed if a (quasi-)experimental design in a large organization were to be used, since smaller sample sizes would be permissible and more people would qualify to participate. Moreover, such a design may allow separation of the three types of incentive purposes (now we could only do so statistically by allowing their error terms to covary). We did not use such a design in the current study because we first wanted to learn how *PM participation* might be related to *employee job performance* in a broad sample of organizations in the field. This design feature gives the present research more external validity.

Interestingly, contrary to what you would expect from most of the many studies we cited in the first paragraph of this chapter, we did not find a direct relation between *PM participation* and *employee job performance*; *PM participation* was only indirectly related to *employee job performance* via *PM quality* and *using PMs for evaluation purposes*. This suggests that only if the co-developed performance measures are used in the right way—i.e. for evaluation purposes—they will increase *employee job performance*. Moreover, the intensity with which the performance measures were developed together with employees may play a role. All the studies that show a performance improvement directly after performance measures were co-developed by employees, use intensive participation projects. Yet in the current study, *PM participation* encompasses a broad range of more or less intensive ways of giving employees influence in the development of performance measures. It may well be that *employee job performance* will only be directly improved if employees get enough time and other resources to develop the measures. Future research may shed a better light on this assumed link between the amount of resources for co-developing the performance measures and the amount of actual performance improvement as a result.

#### 4.5.3 Practical implications

In practical terms, our results suggest that managers can increase the quality of the performance measures by involving employees in their development. Yet *PM participation* is not always positively related to *PM quality* or even *employee job performance*. For instance, we found that

as *information asymmetry* increases according to the manager—i.e. if managers are convinced their employee possesses more job specific knowledge as compared to them—the link between *PM participation* and *PM quality* becomes thin. This finding was unexpected. We hypothesized the opposite, because the reason for managers to involve employees in developing performance measures is to use the employees' job specific knowledge to improve the quality of the performance measures. Earlier research on *PM participation* projects has demonstrated the successful incorporation of employees' specific knowledge into the performance measures (see Chapter 2; Gravesteyn, et al., 2011; Wouters & Roijmans, 2011). The results of the present study can be taken as a warning of too little managerial control in that process. If managers think the *PM quality* is low, they will make less use of the performance measures, which eventually demotivates the employees who co-developed them (Gravesteyn, et al., 2011).

Another practical suggestion for managers derived from our results is to use performance measures for performance evaluations of and periodic discussions with their employees rather than for explicit incentives. Literature suggests that explicit incentives may positively affect *employee job performance* in some cases, and negatively in other cases. These incentives usually have a negative effect on complex jobs that require a lot of creativity, whereas they may work well on simpler jobs (Bonner, et al., 2000; Bonner & Sprinkle, 2002; Gagné & Deci, 2005). Moreover, in general, explicit incentives will decrease employee motivation if the organization's interest resembles their own interest, whereas they increase motivation if the opposite is true (Weibel, et al., 2010). Based also on the results of this study one needs to warn practitioners against using explicit incentives heedlessly, since they can have a detrimental effect on performance. Managers are recommended to first investigate what type of incentives work best within their organization.

#### 4.5.4 Conclusion

Across the board, the results of the present study do point to the need for non-managerial employee participation in the development of performance measures. This will lead to better quality performance measures. Subsequently using these measures for evaluation purposes may stimulate better *employee job performance*.

## Appendix 4A. Measurement instruments

Answering format for all items in the questionnaire:

1. totally disagree – 7. totally agree

### Items “PM participation” (completed by employees)

I have/had influence on...

1. ...how the performance measures are designed
2. ...the choice of which data are used as input into the performance measures
3. ...ongoing modifications to the design of the performance measures
4. ...the implementation of the performance measures
5. ...the maintenance of the performance measures

### Items “PM quality” (completed by managers)

1. The performance measures measure only what I can actually influence
2. The performance measures express accurately whether I function well or not
3. If I perform well, it is directly reflected in the performance measures
4. The performance measures are objective and verifiable
5. Providing effort in my job leads to better performance on the performance measures (deleted)
6. Working hard leads to better performance on the performance measures (deleted)
7. Devotion and effort in the job leads to better performance on the performance measures (deleted)

My performance expressed in the performance measures is strongly affected by...

8. ...changes in economic conditions (recoded and deleted)
9. ...decisions made in other parts of the organization (recoded and deleted)
10. ...changes in the behavior of parties outside the organization, such as customers, suppliers or competitors (recoded and deleted)
11. ...factors beyond my responsibility (recoded and deleted)

### Items “using PMs for monetary compensation” (completed by managers)

I attach very high importance to the performance measures in...

1. ...determining potential salary increases
2. ...determining potential bonuses or extras

**Items “using PMs for nonmonetary rewards” (completed by managers)**

I attach very high importance to the performance measures in...

1. ...increasing my employee’s chance of promotion
2. ...increasing my employee’s authority within the organization

**Items “using PMs for evaluation purposes” (completed by managers)**

I attach very high importance to the performance measures in...

1. ... the evaluation of my employee’s performance
2. ...officially rating my employee’s performance
3. ...periodic discussions with my employee
4. ...periodic performance reports (deleted)

**Items “employee job performance” (completed by managers)**

1. He/she always performs all essential duties
2. He/she always fulfills all responsibilities required by his/her job
3. He/she always meets all formal performance requirements of the job
4. He/she always completes all duties specified in his/her job description
5. He/she never neglects aspects of the job that he/she is obligated to perform

**Items “information asymmetry” (completed by employee and managers)**

In comparison with me...

1. ...my employee is in possession of better information regarding the activities undertaken in his/her area of responsibility
2. ...my employee is more familiar with the input-output relationship inherent in the internal operations of his/her area of responsibility
3. ...my employee is more certain of the performance potential of his/her area of responsibility
4. ...my employee is technically more familiar with the work of his/her area of responsibility
5. ...my employee is better able to assess the potential impact on his/her activities of factors external to his/her area of responsibility
6. ...my employee has a better understanding of what can be achieved in his/her area of responsibility

**Items “delegation of decision rights” (completed by employees)**

In my work...

1. ...I can select different ways to do my work
2. ...I determine how I do things
3. ...I feel a sense of freedom in what I do
4. ...I determine myself what things are done
5. ...I have a lot of choice in what I do
6. ...I make my own choices without being told by management (deleted)

# CHAPTER 5

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Discussion



# CHAPTER 5

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Bianca A.C. Groen



## 5.1 Summary of findings

How could employee participation in developing performance measures lead to better employee job performance? This dissertation reports various answers to this fairly new question by integrating several extant theories and providing empirical results. Here in the Discussion I reflect on the contribution of the theory and methods used, and of course also on the empirical answers reached in the three studies I performed.

In the first study—based on action research in a Dutch beverage manufacturing company—I developed a theoretical model which explains why employee initiative increased after we developed performance measures together with the employees. Using action research allowed us to develop a practically relevant causal model. I found the theory of planned behavior to be applicable as a basis of this model. After I developed performance measures together with the maintenance technicians of the bottling department I noticed their attitudes, perceived social pressure and perceived control towards taking initiatives increased. These are the key variables of the theory of planned behavior. A survey among the maintenance technicians suggested all three variables were related to *employee initiative*, and perceived *control* appeared to be the most important of the three. The results also showed an increase in *departmental performance* after the performance measures were put to use.

The second study built on the model developed in the first study. It tested a slightly moderated version of the model, using a large-scale, cross-sectional survey study. With this method we could statistically check if the developed model also holds in other jobs, organizations and industries. The dependent variable was “employee job performance” and the quality of the performance measures (PM quality) was added as an additional intervening variable. *PM participation* was found to be related to *PM quality*, and *PM quality* was in turn related to employees’ *attitude*, perceived *norm* and perceived *control* to perform. Of these three hypothesized antecedents of *employee job performance*, perceived *control* to perform was the only one for which we found a significant relation with *employee job performance*. Hence, the results of this study point to the conclusion that *PM participation* is related to *employee job performance* via *PM quality* and perceived *control* to perform.

Based on the data obtained with the same survey as the second study, the third empirical study of this dissertation examined the core research question from another perspective: that of managers instead of employees. The results suggest that *PM participation* of employees has a positive influence on the quality of the performance measures from the perspective

of the manager as well. Moreover, it supports the assumption prevalent in the literature that when managers find the performance measures to be of good quality, they are more likely to use them for incentive purposes. Three types of incentive purposes were examined. We found a significant (positive) relation with employee job performance if performance measures are used for employee evaluation purposes. Using the performance measures for either monetary compensation or nonmonetary rewards was not found to be related to employee job performance. In other words, the results of this third study suggest that *PM participation* is related to *employee job performance* because the co-development of the performance measures increases their quality, and when the quality is better, managers are more likely to use the measures for employee evaluation purposes, which is found to be related to employee job performance.

In sum, the results show that if employees participate in developing performance measures, both the participating employees and their managers will find the performance measures to be of better quality. According to the first two studies of this dissertation, performance measures of good quality enable employees to perform better mainly because they increase employees' own sense of control to perform well. In addition, the third study suggest that employee job performance can be increased if managers use performance measures of good quality for evaluation purposes, rather than for explicit, monetary or nonmonetary types of rewards.

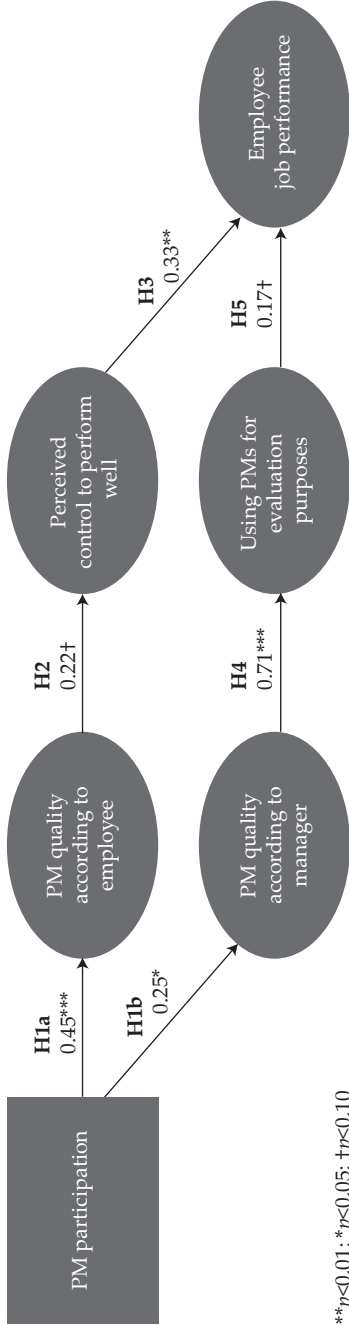
## 5.2 Theoretical implications

The main contribution of this dissertation was giving an explanation for why prior research (Abernethy & Bouwens, 2005; Hunton & Gibson, 1999; Kleingeld, Van Tuijl, & Algera, 2004) has found a positive relation between *PM participation* and *employee job performance*. The three empirical studies reported in this dissertation are the first to examine this. Explaining the relation between *PM participation* and *employee job performance* is important because it gives insight into by what means positive effects can be generated from developing performance measures together with employees. For example, the results of our study suggest that the positive effects of *PM participation* will mainly occur when the co-development of performance measures leads to performance measures of better quality. Performance measures of better quality can be used by managers for evaluation purposes, which is found to increase employee job performance. Furthermore, when performance measures are of better

quality, they increase employees' perceived degree of control over their own performance, which has a positive effect on performance as well. I will further elaborate on what this means for practice in Section 5.3.

The question how *PM participation* can lead to better *employee job performance* was studied with two different research methods that could largely cancel out each other's limitations. The action research of Chapter 2 allowed us to develop a practically relevant causal model and gave detailed insight in what the relations between the model's variables mean in practice. For example, it showed how our intervention led to performance measures of better quality, how it influenced employees' *attitude*, perceived *norm* and perceived *control* to take initiative, and eventually *departmental performance*. Moreover, it showed how using performance measures only for evaluation rather than incentive purposes worked out positively in practice. Using this method was not only important because it gives a better idea of the practical relevance of the uncovered relations, but it also shows that the assumed causality of the relations is probable. In addition to the action study, the survey study shows how the variables were related in general by using a sample of respondents working in various types of operational jobs, organizations and industries. This method gives statistical support for the model developed in the action study.

Rather than giving one explanation for the relation between *PM participation* and *employee job performance*, this study gave two: it showed how both the employee and manager can benefit from employee involvement in developing performance measures. What we have not yet looked at, is whether these mechanisms are complimentary or competing. By means of a post-hoc set of analyses, I perused this additional question with the same database as which I reported on in Chapters 3 and 4 (N=86 pairs). For this model I only look at the variables which turned out to be the main explanatory variables in the *PM participation–employee job performance* relation. Also including other variables would make the model too large to estimate, given the number of observations. Figure 5.1 shows the hypothetical model including the results. Based on the theory reported in Chapters 3 and 4 I hypothesize *PM participation* to be related to *PM quality* according to both employees and managers (H1a and H1b). Moreover, I hypothesize *PM quality* as rated by the employee to be related to the perceived degree of *control* over their own performance (H2) which in turn is hypothesized to be related to actual *employee job performance* (H3). Furthermore, managers are hypothesized to use the performance measures to a greater extent for evaluation purposes if they find the PMs to be of better quality (H4) and using the performance measures for evaluation purposes is hypothesized to be related to *employee job performance* (H5).



\*\* $p < 0,01$ ; \* $p < 0,05$ ; † $p < 0,10$

Figure 5.1 Standardized results of the structural model

The same methods are used as in Chapters 3 and 4. The model fit of both the measurement model ( $\chi^2=315.76$ ,  $df=259$ ,  $p=.009$ ; Bollen-Stine  $p=.559$ ; CFI=.951; TLI=.944; RMSEA=.051) and the structural model are sufficient ( $\chi^2=318.77$ ,  $df=267$ ,  $p=.016$ ; Bollen-Stine  $p=.588$ ; CFI=.956; TLI=.950; RMSEA=.048;  $\Delta\chi^2=3.01$ ,  $\Delta df=8$ ,  $p=.934$ ). The results are similar to the results presented in Chapters 3 and 4 and all relations remain significant at no less than a .10 level. This suggests the models are mainly complimentary.

## 5.3 Practical implications

The studies of this dissertation all investigated how employee job performance can be increased by giving employees influence on the development of performance measures. All three studies showed that the quality of performance measures can be improved by involving employees in the development of performance measures because then the invaluable job specific knowledge of employees will be included in the performance measures. Moreover, the results suggest performance measures of better quality can give employees a feeling of control over their own performance and can be used by managers to evaluate the performance of employees and to discuss it together with those employees. Both of these enabling factors were found to be positively related to employee job performance.

Several other factors—which are generally considered to have a positive effect on performance—where not found to be related to employee job performance. Two of them (the attitude of employees towards performing well and the social pressure they feel to perform well) will probably not harm the organization, but they did not appear crucial for the desired effect to result. The two other examined factors (using the performance measures for concrete incentive purposes such as giving monetary compensation or non-monetary rewards) may in some cases be detrimental to the performance of employees. I recommend organizations to restrain from giving employees concrete performance incentives because they may decrease employee job performance. Note that once such explicit incentives are used on a regular basis, the bad influence on employee job performance will continue to be present even after the organization stops using these incentives. Pink (2011) wrote an easy-to-read interesting book on this topic and for a quick entertaining peek into the reasons for these—to some irrational—findings I refer to the animated video of RSA (2010).

Most likely, the studies' results are not directly applicable to just any organization. They are probably very dependent upon the situation. Before organizations start a large project based on these results, I recommend

they first try to find out which factors are the most important to influence employee job performance in their organization. In large organizations this can easily be done by asking a representative sample to complete the questionnaire of Appendix 5A which is based on the survey used in Chapters 3 and 4. The Appendix contains benchmark data, including an accompanying explanation which can be used to interpret the scores. In smaller organizations using interviews to find out the most important factors may be more appropriate. Section 2.3.4.2 has described such an interview approach. Francis et al. (2004) show how such an interview can be developed and Jaccard (2012) gives an overview of alternative approaches to find out which factors are important for individual cases.

Note that although the studies seem to show positive effects of involving employees in developing performance measures, such positive effects do not always come about. It is very important to carefully prepare such a practice. Based on this research, we have published several papers in professional journals with guidelines for developing useful performance measures together with their employees (Groen, 2012; Groen, Wilderom, & Wouters, 2011; Groen & Wouters, 2011a, 2011b). In this section I will use the format of Groen et al. (2011) to summarize the steps reported in these papers. These steps are based on our experience in several performance measurement projects of which the project reported in Chapter 2 was the last one.

### 5.3.1 Guidelines for co-developing performance measures

#### Step 1: Appoint a project leader

If you want the project to succeed, appointing an independent project leader is indispensable. The project leader has to give the project priority and has to get the project going. The project leader has the following tasks:

- organizing the project;
- convincing people of the benefits of performance measurement;
- finding out about current performance measurement practices;
- translating knowledge and ideas of managers and employees to performance measures.

The rest of this section will be written as a manual for project leaders, although they will need to complete the steps in close consultation not only with the employees but also with the managers involved.

**TIP: One department at the time**

Keep the project manageable by involving departments in the project one by one. Only then you can give employees the attention they need, which is necessary to establish a real culture change.

**Step 2: Formulate goals**

Make sure you have one or more clear project goals. Developing performance measures is not a goal on its own, but a means to another end. Examples of project goals are:

- enabling employees to think of more improvement ideas;
- improving departmental or individual performance;
- improving the transparency with which members of a team are operating and performing;
- reducing costs.

Furthermore, the performance measures must fit to the goals of the organization/department/team. Only then they will steer employees in the right direction. Hence, try to determine which organizational or departmental goals must be captured by the performance measures which will be developed.

**Step 3: Compose groups**

Varied groups of employees should be composed. Give every group a theme which defines the direction of the performance measures they will be developing. In other words, you prepare in advance what kind of performance measures are to be developed without restricting employees too much. If you use themes which are related to the departmental/organization's goals, the resulting performance measures are more likely to fit to these goals. For example, the bottling department described in Chapter 2 used the themes energy use, material losses, planned maintenance and machine failures. They fit the company's goals of reducing unnecessary production costs and improving the environmental footprint.

**Step 4: Inform stakeholders**

It is very important to be open and honest towards everyone involved in the project throughout the whole project. Make sure to have at least one personal conversation with everyone involved. Use this conversation to

comfort people who are afraid of not knowing how to develop performance measures (some people have less of a quantitative inkling) by telling them the steps you are going to take together, under your extensive guidance. Moreover, in this conversation the project's goals and the stakeholders' role in the project should be clarified. It is important to not mince matters: mention what the actual goals are, even if they may sound less pleasant to the stakeholders. In the projects we have done, the goal was to develop performance measures which would support employees in their work and the measures were not developed to be used for rewarding employees. We are not sure if the here described approach is usable for developing performance measures to assess individual performance.

**TIP: Dealing with resistance**

Bear in mind that people involved in the project may show resistance. Tell them their input is needed to develop relevant performance measure which can assist them in their work. You can keep resistance down by staying in close touch with everyone involved and enabling them to speak their minds.. This will help noticing any resistance in time. Listen well to the reactions and concerns of each employee, take seriously what they say and show it! Mutual trust is the backbone of this project.

**Step 5: Do a Brain write**

Performance measures are especially useful if they measure aspects of the job that are to be improved and are "improvable". Therefore, we advise to start the performance measure development project by organizing a "brain write" for each group. Give every employee a form with a concrete improvement question (see Figure 5.2). In ten minutes, everyone writes down as many improvement ideas as possible. Subsequently, they forward their form to their neighbor, and again write down as many ideas as possible within ten minutes. This process continues until everyone is in possession of their original form again. There are also more anonymous ways of adding to each other ideas, such as an e-brainwrite. In such a brain write, the group members send their in their ideas via email to the project leader. Subsequently, the project leader anonymizes these ideas and sends them to the next person. An e-brainwrite is recommended over the regular brain write when it is difficult to get everyone in the same place at the same time, or when the trust level within the team is low.



How can we save as much energy as possible in the bottling department?  
Energy = gas, water, electricity

What can we improve?	How can we measure this?

Figure 5.2 Example of a brain-write form

### Step 6: Prioritize improvement ideas

After the brain-write session, a session should be organized, in which the groups determine for which clustered set of improvement ideas they want to develop performance measures. Make sure to cluster the improvement ideas in categories before the session. Then ask group members in the session to point out which of these categories they find the most important. List all chosen categories, including the number of times they are listed. A group discussion afterwards in which everyone can substantiate one's point of view will reveal which of the improvement categories are deemed to be the most important. Performance measures will be developed for the chosen improvement categories in the next sessions.

#### **TIP: Create category cards**

Create cards containing the name of the improvement category and all its improvement ideas. This will remind group members of the meaning of the categories and shows how these categories were formed (based on their own improvement ideas). These cards preserve the improvement ideas, and show the employees they are taken seriously. Moreover, the cards will facilitate the comparative assessment between the categories, because employees can literally put the cards against one another.

### Step 7: Develop performance measures

Plan a third round of meetings with the groups in which you start the actual development of performance measures. Discuss for every category what kind of performance measures would be suitable. Neely et al. developed a checklist which can be used to define all aspects of performance measures (Neely, Bourne, Mills, Platts, & Richards, 2002). Figure 5.3 contains a slightly adjusted version of it. It is recommended to keep the answers to all questions as documentation with the eventual performance measures, to enable anyone to look up why certain choices are made.

### Step 8: Create prototypes

It is our experience that it will take not more than about another 7 meetings per group to finish the creation of the specific performance measures. Create prototypes of the measures before each meeting based on as much information as possible, gathered in and after the last meeting. A prototype

**1. What should this performance measure be called?**

A good title is self-explanatory, avoids jargon and explains what the measure is and why it is important

**2. What is the purpose of this performance measure?**

Why are we introducing this measure? What do we want it to do?

**3. What business objectives does this performance measure relate to?**

**4. What target do we want to reach?**

What level of performance do we desire, within what time, and why?

**5. How are we going to measure/calculate this dimension of performance?**

Try to find an understandable formula which exactly describes what data are needed and explain why these formula and data are used

**6. Where can we find the data needed?**

**7. How often should we measure and how often should we discuss the results?**

Think about how much time it costs to collect the data and how long it takes before you can see changes

**8. Who is responsible for keeping the performance measure up to date?**

**9. Who is/are responsible for ensuring that performance along this dimension improves? What actions will they be taking to do this?**

Figure 5.3 Checklist based on Neely et al. (2002)

is a realistic version of a performance measure which is still completely open for discussion. It is vital to use real-life data in the prototype, because this is the only way in which you can be sure that everyone is talking about the same input-data. Ask the group for their opinion about (the design of) the measures and continue asking until you know how the prototype can be further improved. This step demands project leaders to take a balanced role: they should alternate between being facilitators who listen carefully to the ideas of the project members and being experts who use their expertise to contribute to shaping these ideas.

**TIP: Assign homework**

In the projects we led so far, it turned out to be impossible to answer all questions of the Neely et al. checklist during the meetings. Most questions evoke new questions such as: what kind of information systems do we already have to base our performance measures on? Make agreements about whom will figure this out and make sure you get a quick answer to as many questions as possible.

**Step 9: Use the performance measures**

The first prototype should directly be put into use, even when it is not yet completely finished. People are only able to know what aspects of the performance measures can be further improved when they personally experience how the performance measures work. Make sure to regularly discuss the results and agree on whom will take which actions based on these results.

**Step 10: Maintain the performance measures**

A performance measures is “finished” as soon as no-one has any other ideas to further improve them. This does not mean the performance measure can never be changed anymore. It would be wise to evaluate every year:

- whether all performance measures are still being used;
- whether everyone is still convinced of their usefulness;
- whether there is a need for additional performance measures.

Enter this into an agreement with the employees in order to create a continuous measurement and improvement process, which eventually may make the project leader redundant.

## 5.4 Limitations

The three studies of this dissertation identified several variables which may explain how *PM participation* can lead to increased *employee job performance*. Contrary to what we assumed based on prior research, we did not find a direct effect between *PM participation* and *employee job performance* in our sample. This probably means that not just any kind of *PM participation* increases *employee job performance*. Most likely an extensive intervention with enough time and resources to seriously deal with the ideas of the employees is necessary to generate an increase in *employee job performance*. Moreover, the developed performance measures should cover all aspects of performance, which was not necessarily true for our survey sample (cf. Bommer, Johnson, Rich, Podsakoff, & MacKenzie, 1995; Derfuss, 2009). Based on our experience in Chapter 2's case company and several other organizations, Section 5.3.1 give guidelines for such an intervention.

Combining the results of our action study and the large-scale survey suggests that some of the found relations are quite situation specific. For example, Chapter 3's results suggest only employees' perceived control to perform to be important for employees to perform well. Yet in our case company, not only employees' perceived control to take initiative was related to employee initiative, but also their attitude and perceived norm towards taking initiative. Perhaps, this difference can be explained by the fact that both models have different dependent variables (the only thing we know about the similarities of the two dependent variables is that employee initiative is generally found to be an important part of employee job performance; Campbell, 2000; Crant, 2000; Frese & Fay, 2001). Yet also the theory of planned behavior stresses that the theory is very situation specific (Fishbein & Ajzen, 2010; Jaccard, 2012). Therefore, the findings could have been different if we had chosen to survey a specific company (as in the first study) or sector.

The examined relations of Chapter 4 might be dependent upon the situation as well. In some organizational situations explicit incentives may have positive effects on the performance and in other cases it may have negative or neutral effects. Chapter 4 considered several possible moderators which may explain these differences, such as the complexity of the job or the resemblance between the interests of the organization and the employee (Bonner, Hastie, Sprinkle, & Young, 2000; Bonner & Sprinkle, 2002; Gagné & Deci, 2005; Weibel, Rost, & Osterloh, 2010). These effects equal out in the broad sample which was used and therefore we did not find any effects of explicit incentives on employee job performance.

We expect such positive or negative effects to be present in more specific samples.

This dissertation gave two different views on how *PM participation* can lead to more *employee job performance*. Of course this does not mean this dissertation captured all possible mechanisms. Other mechanisms have been found to be relevant in studies in related areas such as participation in goal setting, participative leadership and budgetary participation. Examples of mediating factors found in these studies are fairness (Korsgaard & Roberson, 1995; Lau & Tan, 2006; Libby, 1999; Sholihin, Pike, Mangena, & Li, 2011; Wentzel, 2002) and trust (Huang, Iun, Liu, & Gong, 2010; Lau & Buckland, 2001; Lau & Tan, 2006; Sholihin, et al., 2011). Future research may investigate if these mechanisms are relevant for PM participation as well and how they relate to the models of this dissertation.

## 5.5 Research agenda

In this last section I will elaborate on research subjects and questions I find interesting to study in the future. And although I have to admit that I extremely enjoyed writing this section, I am convinced this section is not only interesting for me, but also for readers who want to gain inspiration for future research topics themselves. Moreover, this section gives an idea of who I am and what I stand for as a researcher at this moment in time, which may be good to know for anyone who would like to cooperate with me in the near future.

When I think about my future research, a few things are clear to me: (1) I want my research to be about how the behavior of people within organizations is or can be affected; (2) I want to answer research questions which are relevant for organizations; and (3) I want to develop my skills in various research methods.

Studying how the behavior of people within organizations is or can be affected strictly belongs to the field of organizational behavior. One of the things I loved about my PhD research was applying my knowledge of organizational behavior to other fields, in this case the field of management accounting. I would like to keep doing that: staying on the edge of organizational behavior and management accounting and using knowledge from the one field to enrich the other and the other way around.

Moreover, I am more interested in doing applied research than in fundamental research. With applied research, I mean that rather than to just gain knowledge, I would like to study problems which actually exist in organizations. Or, in other words, when doing research, I always want to keep in mind how the results can help organizations or organizational members.

Note that the previous statement does not mean that I only want to do action research type of studies. On the contrary, I would like to use various research methods to really get a scientifically sound answer which fits best to the research question. As this thesis has shown, I already know how to use methods such as action and survey research. In the near future I hope to be able to extend this knowledge by also learning how to use experiments and meta-analyses. Both of these methods have fascinated me for some time already. Experiments because they allow to study a phenomenon under “controlled” conditions, and meta-analyses because they show how things work “in general”, based on what has already been studied and therefore automatically based on a large sample.

While doing my PhD I have gotten a better view on which topics (related to my thesis) I find particularly interesting. In the following subsection I will name two of them and I will explain what studies I would like to do on these topics in the future.

### **5.5.1 Developing high-quality performance measures**

To our knowledge, within the field of management accounting, the paper of Chapter 2 and the guidelines of Section 5.3.1 were one of the first to report in detail how a performance measure development process can be shaped. The design of this project was based on the experience of my promoters and their MSc graduate students in several other organizations. Even though we know this process has led to positive results in this and several other organizations, we do not know if other ways of developing performance measures could have been equally effective. Neither do we know if we perhaps included unnecessary steps in the intervention. I would find it interesting to refine the guidelines of Chapter 2 and Section 5.3.1 by more closely investigating which steps are really necessary for developing performance measures of high quality to stimulate the right behavior of employees. When these steps are determined, they can lead to the development of good quality systems against as little organizational resources as possible.

Quality of performance measures can be defined in several ways. In this dissertation I used Moers’s (2006) definition: the extent to which managers

find the performance measures to be sensitive to the actions of their employees, precise in measuring relevant aspects of their employees' performance, and verifiable. But other publications have mentioned other aspects of quality which may be included in future research as well. For example, the performance measures should reflect the strategy of the organization (Chenhall, 2005) or at least direct employees in the right direction (Merchant & Van der Stede, 2007), they should be accepted by employees (Abernethy & Bouwens, 2005) and they should be technically valid, i.e. accurate, accessible, understandable, reliable, and timely (Burney, Henle, & Widener, 2009; Kaplan & Norton, 1996).

In the course of my PhD study I came across descriptions of effective methods for developing performance measures in fields outside of management accounting (see for an overview of the development approaches in the various fields: Bourne, Neely, Mills, & Platts, 2003; Mendibil & MacBryde, 2005; Pritchard, Harrell, DiazGranados, & Guzman, 2008; Pun & White, 2005). Most of these papers discuss how to develop performance measurement systems, but they touch on how to develop the measures as well. When trying to find a method consisting of only the necessary steps to develop high-quality performance measures, I would start with a literature review investigating the differences and similarities of the already described methods. For example, a similarity between all methods is that all of them ask employees for input in the development of the performance measures and a difference is that this influence of employees is not always central in the methods to develop performance measures. If enough quantitative data is available from the literature, a meta-analysis may give an initial idea of how necessary the various steps are. Afterwards, I would like to use (semi-)experiments (if possible in real organizational settings) to empirically test which of the steps are really necessary to develop high quality performance measures.

### 5.5.2 Performance rewards

A wide-spread rumor in organizational practice and in management accounting research is that paying organizational members for performance motivates them to perform better. I will never deny that performance related pay can be beneficial to organizations, for example when employees are not intrinsically motivated to perform well. However, I believe (of course, also based on research) there are many—and increasingly more—situations in which pay for performance can be detrimental to organizations. Due to the changed view on careers, more and more people are looking for jobs that are fulfilling their own personal needs and therefore intrinsic motivation plays an increasingly



important part in employment contracts (Hall, 1996, 2004). Since incentives are generally seen as controllers of behavior, employees' intrinsic or autonomous motivation is inhibited when incentives are used (Deci, Koestner, & Ryan, 1999; Holmås, Kjerstad, Luråsd, & Straume, 2010). Since the extrinsic motivation given by the incentives cannot compensate for all of the loss in intrinsic motivation, employee job performance drops when incentives are used to motivate these employees (Deci, et al., 1999; Falk & Kosfeld, 2006; Wong-On-Wing, Guo, & Lui, 2010).

I think one reason for why many people are convinced rewarding merely has positive effects is that it sounds quite rational. But a probably more important reason for why many scholars believe this, is the large amount of support that is found for the relation between pay and performance (e.g. Jenkins Jr., Mitra, Gupta, & Shaw, 1998; Stajkovic & Luthans, 1997, 2003). The same conviction of the existence of merely positive effects of pay for performance also used to be prevalent in organizational behavior literature. However, in the meantime organizational behavior scholars have found several moderators of these relations. One of the reasons for why research continued to find positive effects of rewards on performance, was that it mainly studied cases in which pay for performance indeed on average has positive effects, for example in jobs of low complexity (Stajkovic & Luthans, 2003). Perhaps, such moderators also explain the positive effects of rewards repeatedly found in management accounting research. For example, most management accounting research focused on rewarding managerial employees, whereas organizational behavior research focused on employees in lower organizational levels. Perhaps, pay for performance is more relevant in higher organizational levels. Moreover, much management accounting research on pay for performance has been conducted in the US, whereas the effects of such a practice are likely to be highly dependent upon culture (Otley, 1999, 2001). This would all be interesting to investigate.

I agree with Otley (1999, p. 366) that "the inter-connections between the [fields of management accounting and organizational behavior] need to be better recognized to avoid the many counter-productive examples of short-termism driven by financial incentive schemes that are seen in practice". The management accounting literature can learn from what has already been done in the field of organizational behavior and the other way around. Fortunately, increasingly more management accounting scholars are aware of this. I hope to contribute my bit towards this topic in my future research.

## Appendix 5A–Which factors are important in your organization?

### 5.A1 Questionnaire

Listed below are the items which can be used to measure which factors are important to improve employee job performance in your organization. When using these items in a questionnaire ask employees/managers to rate each of these items on the following 7-point scale:

1	2	3	4	5	6	7
Totally disagree	Disagree	Moderately disagree	Neutral	Moderately agree	Agree	Totally agree
Not applicable						

#### 5.A1.1 Items to be completed by employees whose performance is measured

The following statements are about characteristics of the performance measures which are used to measure your performance. We understand it may be difficult to evaluate all performance measures in your work environment at once. Nevertheless, we ask you to do so. When in doubt, the reaction that first comes to mind is usually the best.

To what extent do you agree with the following statements? Select “1” if the statement is not applicable to your situation.

- A1.I have/had influence on how the performance measures are designed
- A2.I have/had influence on the choice of which data are used as input into the performance measures
- A3.I have/had influence on ongoing modifications to the design of the performance measures
- A4.I have/had influence on the implementation of the performance measures
- A5.I have/had influence on the maintenance of the performance measures

The following statements are about how much influence you have/had on the performance measures. To what extent do you agree with the following statements?

- B1. The performance measures measure only what I can actually influence
- B2. The performance measures express accurately whether I function well or not
- B3. If I perform well, it is directly reflected in the performance measures
- B4. The performance measures are objective and verifiable
- B5. Providing effort in my job leads to better performance on the performance measures

The following statements are about your opinion on always meeting everything that is expected of you in your work. To what extent do you agree with the following statements?

- C1. I find it positive to always meet everything that is expected of me in my work
- C2. It satisfies me to always meet everything that is expected of me in my work
- C3. I find it important to always meet everything that is expected of me in my work

Please think of people in your work environment who are so important to you that their opinions or behavior affects you, while responding to the following statements. To what extent do you agree with the following statements?

- D1. They encourage me to always meet everything that is expected of me in my work
- D2. They themselves do always meet everything that is expected of them in their work
- D3. They themselves try to always meet everything that is expected of them in their work

The following statements are about the extent to which you are able to always meet everything that is expected of you in your work. To what extent do you agree with the following statements?

- E1. It is totally up to me whether I always meet everything that is expected of me in my work
- E2. Certain conditions make it impossible for me to always meet everything that is expected of me in my work
- E3. Certain factors make it difficult for me to always meet everything that is expected of me in my work

### 5.A1.2 Items to be completed by managers

This survey regards the employee who has completed our previous questionnaire (<name employee>). Whenever we talk about your employee, we mean this person specifically.

The following statements are about this employee. To what extent do you agree with the following statements?

- F1. He/she always performs all essential duties
- F2. He/she always fulfills all responsibilities required by his/her job
- F3. He/she always meets all formal performance requirements of the job
- F4. He/she always completes all duties specified in his/her job description
- F5. He/she never neglects aspects of the job that he/she is obligated to perform

The following statements are about characteristics of the performance measures you use to measure the performance of your employee. We understand it may be difficult to evaluate all performance measures at once. Nevertheless, we ask you to do so. When in doubt, the reaction that first comes to mind is usually the best.

To what extent do you agree with the following statements?

Select "1" if the statement is not applicable to your situation.

- G1. The performance measures measure only what my employee can actually influence
- G2. The performance measures express accurately whether my employee functions well or not
- G3. If my employee performs well, it is directly reflected in the performance measures
- G4. The performance measures are objective and verifiable

The following statements are about the importance that you attach to the performance measures. To what extent do you agree with the following statements? Select "1" if the situation mentioned never occurs to you.

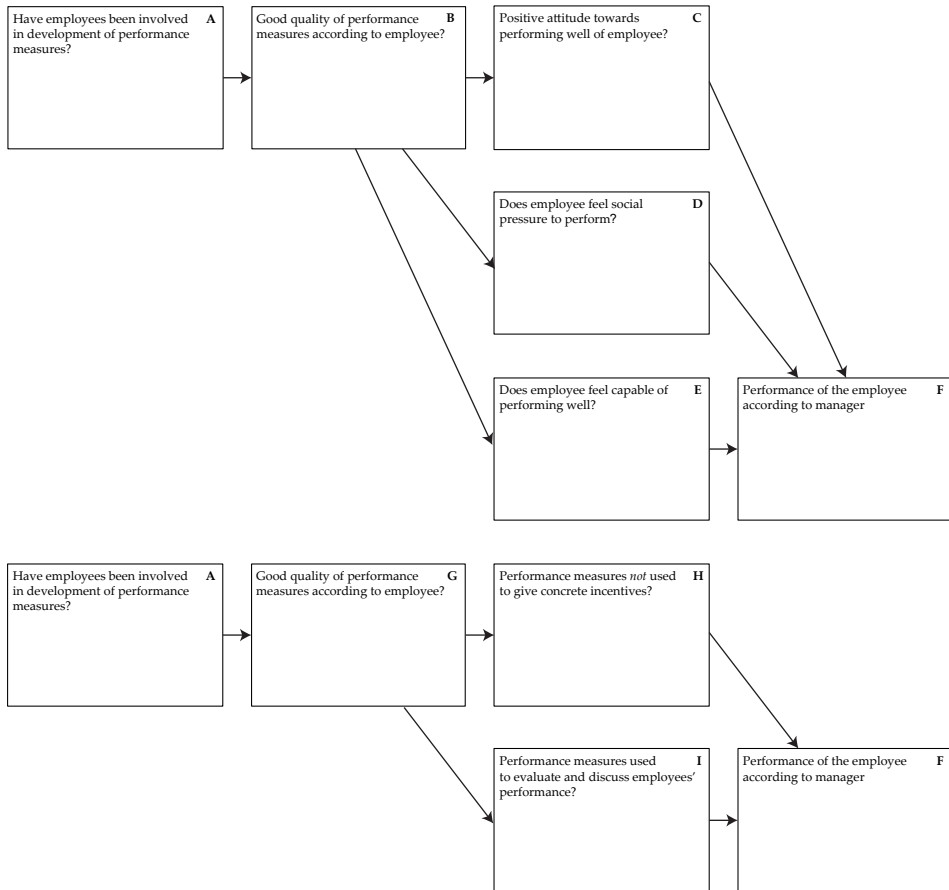
I attach very high importance to the performance measures in...

- H1. ...determining potential salary increases
- H2. ...determining potential bonuses or extras
- H3. ...increasing my employee's chance of promotion
- H4. ...increasing my employee's authority within the organization
- I1. ... the evaluation of my employee's performance
- I2. ...officially rating my employee's performance
- I3. ...periodic discussions with my employee

### 5.A2 Benchmark numbers

Tables 5.1 and 5.2 give benchmark numbers based on the scores of the 95 employees and 86 managers who responded to our survey (see Chapters 3 and 4). The scores on the completed questionnaires can be compared to the benchmark by first averaging the scores on the items with a corresponding character. Mark the cells in the benchmark tables which correspond with those averages. On the top of each column, you will find the symbols ‘--’, ‘-’, ‘+’ en ‘++’. Enter these symbols in the box of the empty framework of Figure 5.4 with the corresponding character. This will give you an overview of your organization’s scores and shows where improvement is possible. Section 5.A3 explains the meaning of these scores.

**Figure 5.4** Benchmark scores for managers



**Table 5.1** Benchmark scores for employees

	--	-	+	++
A. PM participation	0,00-1,99	2,00-3,19	3,20-4,99	5,00-7,00
B. Quality of the performance measures	0,00-3,74	3,75-4,59	4,60-5,39	5,40-7,00
C. Attitude towards performing well	0,00-5,32	5,33-5,99	6,00	6,01-7,00
D. Social pressure to perform well	0,00-4,32	4,33-5,32	5,33-5,66	5,67-7,00
E. Perceived capability to perform well	0,00-2,99	3,00-3,66	3,67-4,66	4,67-7,00

**Table 5.2** Benchmark scores for managers

	--	-	+	++
F. Performance employee	0,00-5,19	5,20-5,79	5,80-6,19	6,20-7,00
G. Quality of the performance measures	0,00-4,24	4,25-4,99	5,00-5,49	5,50-7,00
H. Using PMs for concrete incentives	5,75-7,00	5,00-5,74	3,94-4,99	0,00-3,93
I. Using PMs for evaluation purposes	0,00-4,91	4,92-5,32	5,33-5,99	6,00-7,00

### 5.A3 Explanation of the outcomes

A. If this box contains a '--' or '-' and the boxes "B and/or G have a '--' or '-' as well, then the quality of the performance measures can be improved by involving employees in developing the performance measures in a way which is described in Section 5.3.1.

B. If this box contains a '--' or '-' it might be sensible to improve the quality of the performance measures. One way to do that is following the step-by-step guide of Section 5.3.1. This guide focuses on involving employees in developing the performance measures, so this information is especially relevant if box "A" also contains a '--' or '-'.

C. and D. The score in these two boxes can be increased by setting a good example. Show that you yourself always do everything to improve your work. You can do this for instance by taking the initiative to improve the performance measures together with the others. Note however that it differs per organization if this has an influence on performance or not.

E. A '--' or '-' in this box may imply there are certain barriers which constrain employees from performing optimally. To solve this you can start by discussing this with your employees. If the scores in boxes "B"/"G" and "A" are low as well, it may be useful to together with the employees improve the performance measures the employees are measured by. This will give you and your employees more insight in the working processes and in what can be further improved.

F. If this box contains a '+' or '++', then your employee scores higher on performance than average. If you believe the same goes for your other employees, then improvements may not be necessary. In case the performances are disappointing or if you still want to improve certain issues, please check the boxes that contain a '--' or '-' for improvement suggestions.

G. See "B"

H. If this box contains a '--' or '-', then you make more than average use of concrete incentives such as monetary compensation or nonmonetary rewards (e.g. promotion). If this is the case and the performance of your employees is disappointing, it might be because of this. Unfortunately, removing monetary rewards right away will probably do more harm than good, because your employees will be used to receiving them. You can try to gradually focus less on these rewards by rewarding on a more incidental basis. Note that more research is necessary on what to do when organizations already use monetary compensation or nonmonetary rewards.

I. If this box contains a '++' or '+', then you make more than average use of the performance measures to discuss and evaluate the performance of your employees. This generally has a positive effect for the performance of employees. Note that in order to have a positive effect, the quality of the performance measures should be good (see "B" and "G"). If they are not, the quality should be improved. If this box contains a '--' or '-' and boxes "B" and "G" contain a '++' or '+' it might be a good idea to use the performance measures as a basis for discussions with your employees about their performance and what/how they can improve.

# LITERA- TURE

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# LITERA- TURE

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Bianca A.C. Groen

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