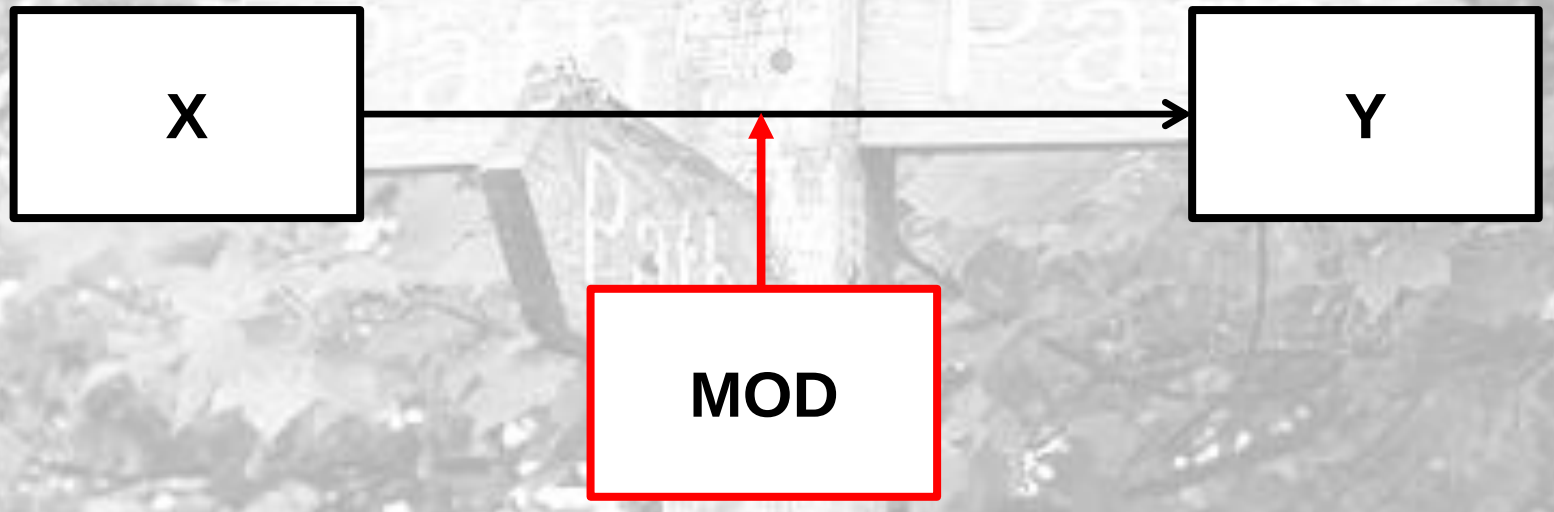
TILBURG UNIVERSITY

# MODERATION: THE CONCEPT

# Moderating variable




A variable that alters the strength and sometimes even the direction (positive ↔ negative) of the relationship between X and Y

*Aka: moderator, interaction variable*

# Agenda

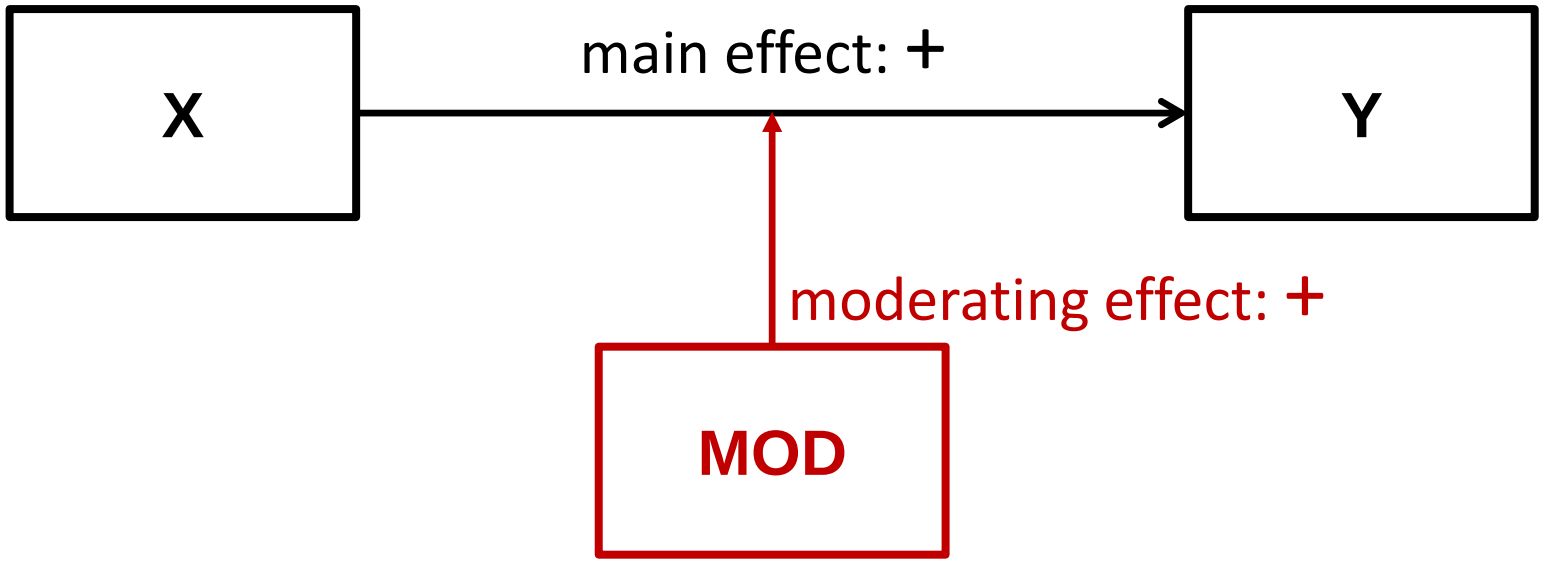
- A positive effect becoming stronger
- A negative effect becoming stronger

- A positive effect becoming less strong
- A negative effect becoming less strong

- Extensions / special cases

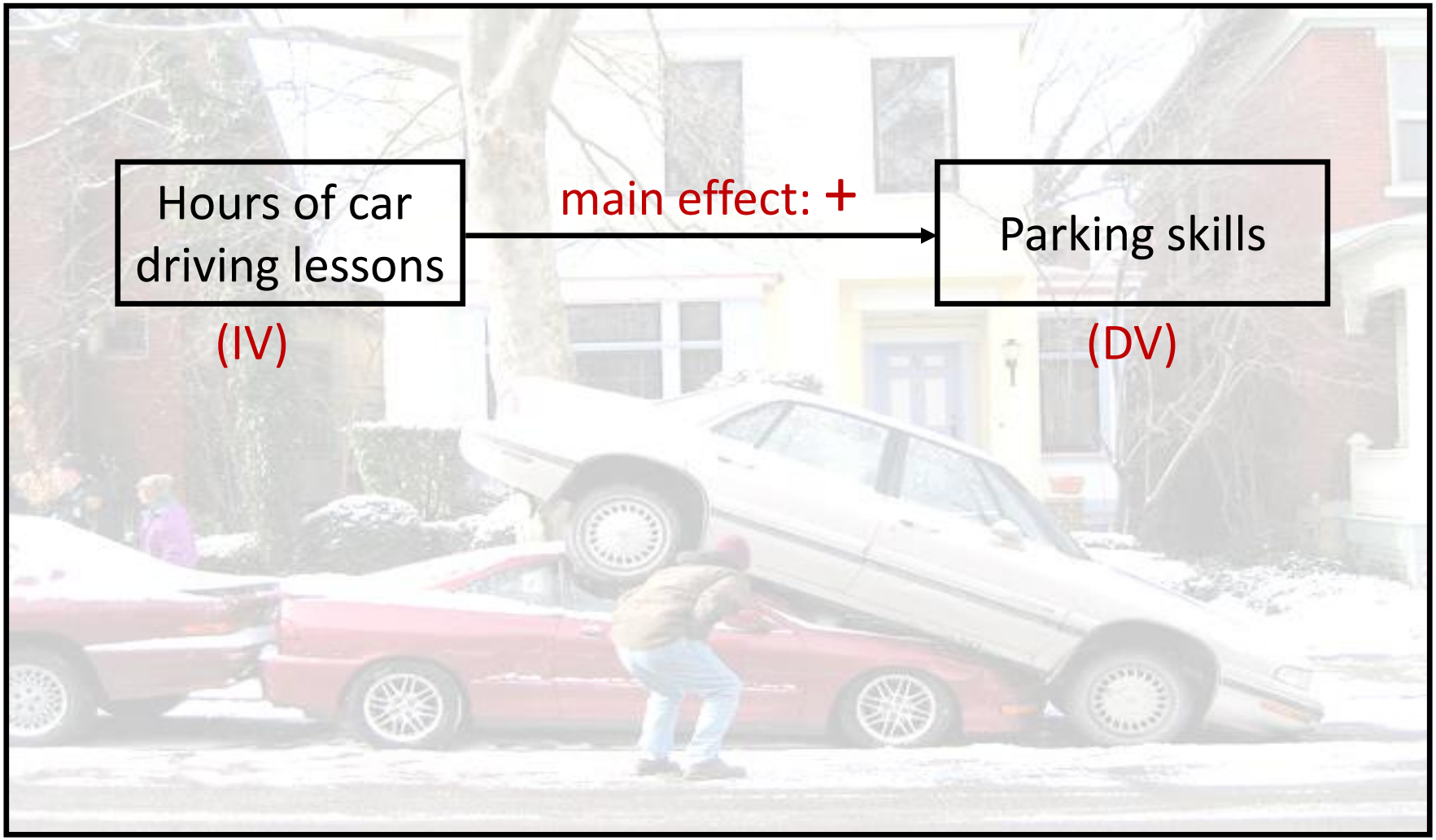
# 1. A positive effect becoming stronger

# A positive effect becoming stronger

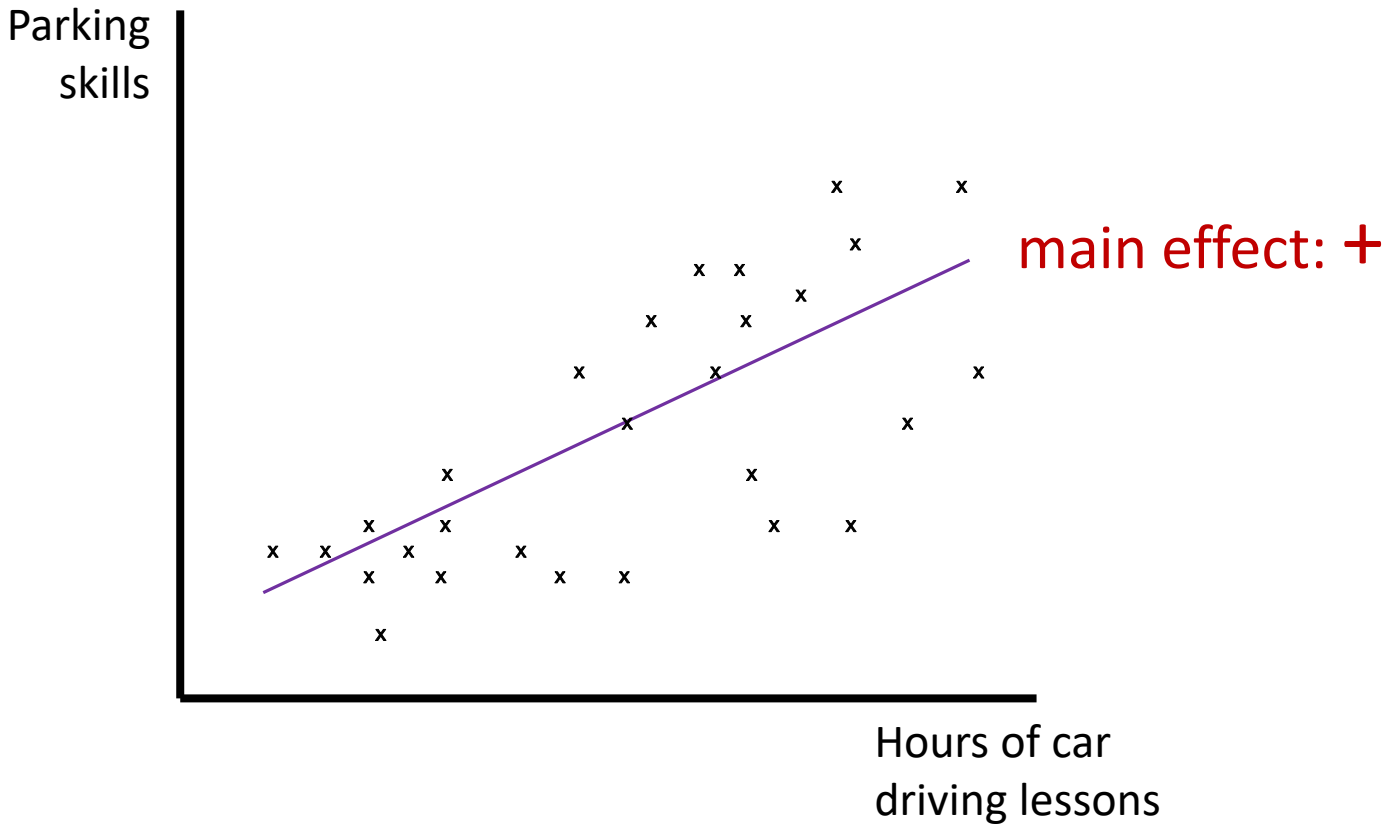



The effect of X on Y becomes **more positive** when MOD increases

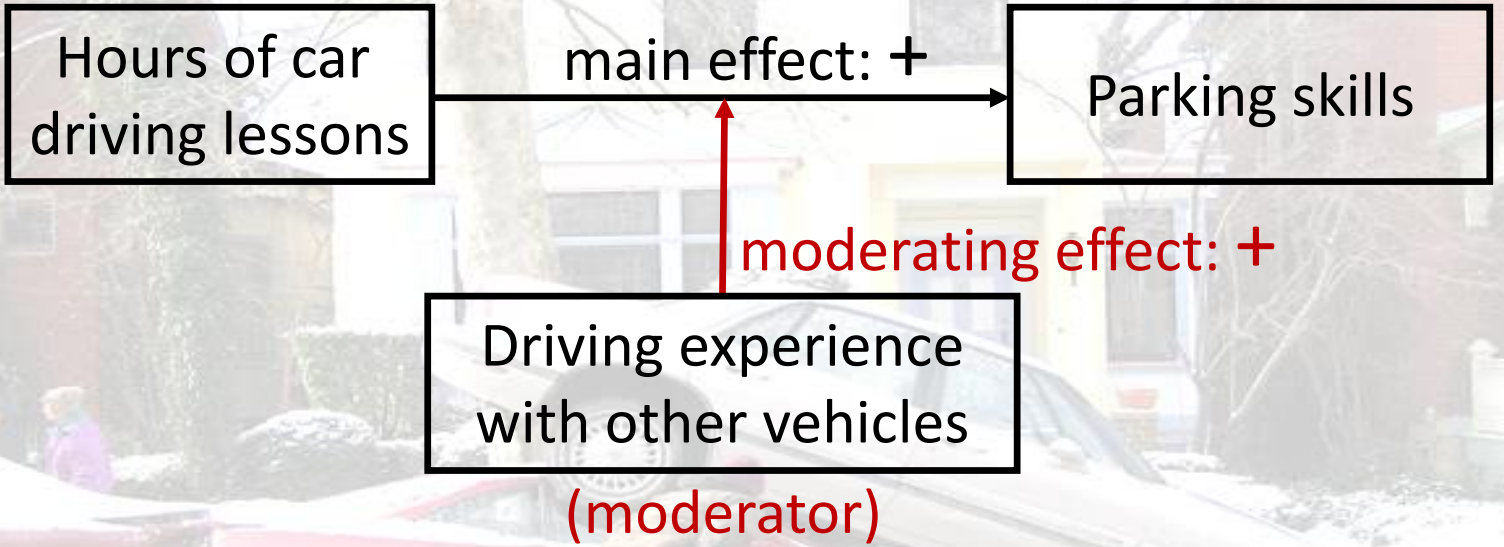
# Example


Hours of car driving lessons
(IV)
main effect: +
Parking skills
(DV)

# Visualization of main effect

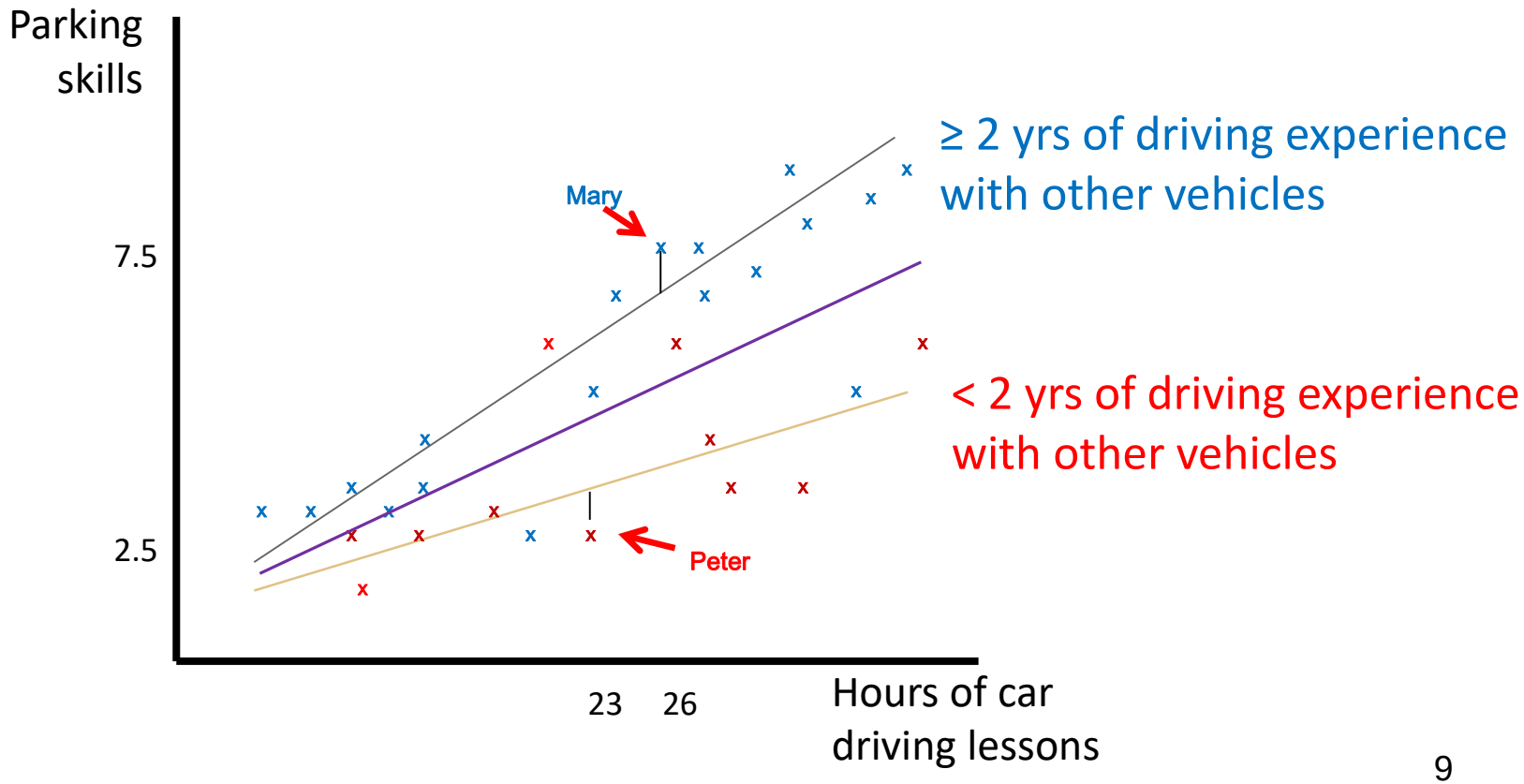


# Moderating effect



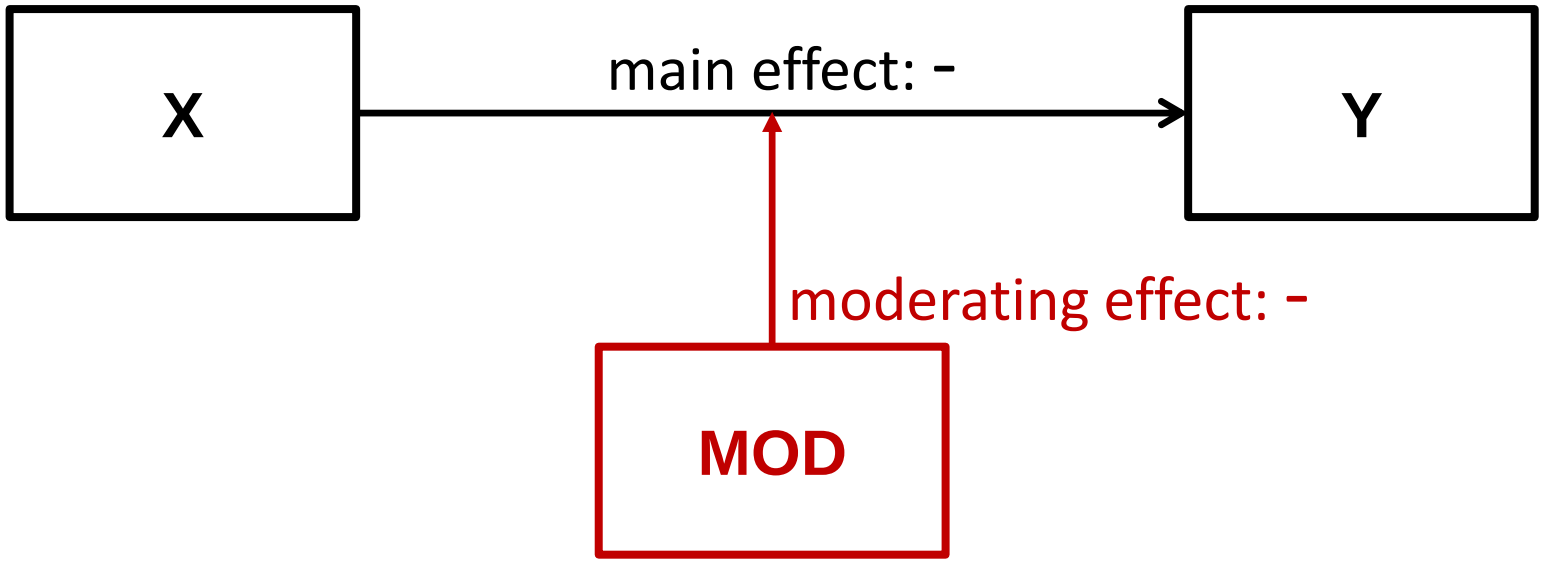

The effect of hours of car driving lessons on parking skills is more positive when driving experience with other vehicles increases.

# Visualization of moderating effect



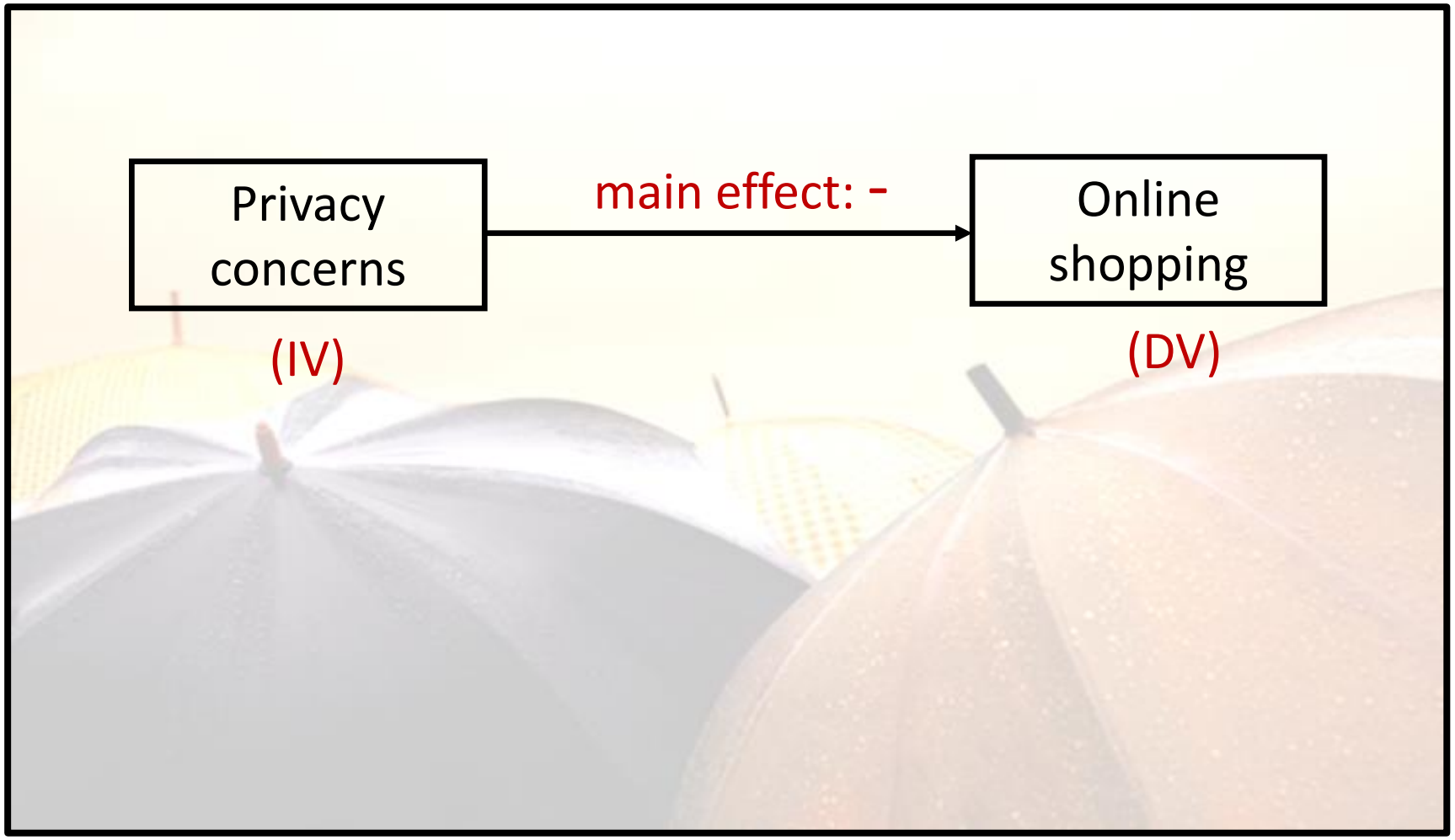
# 2. A negative effect becoming stronger

# A negative effect becoming stronger

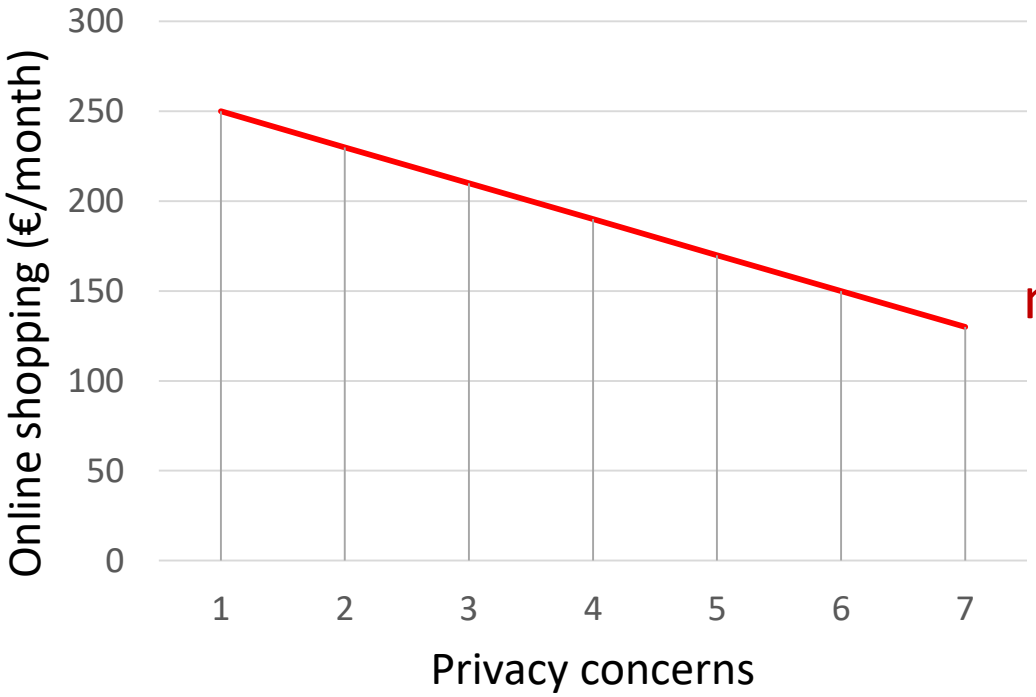



The effect of X on Y becomes **more negative** when MOD increases

# Example



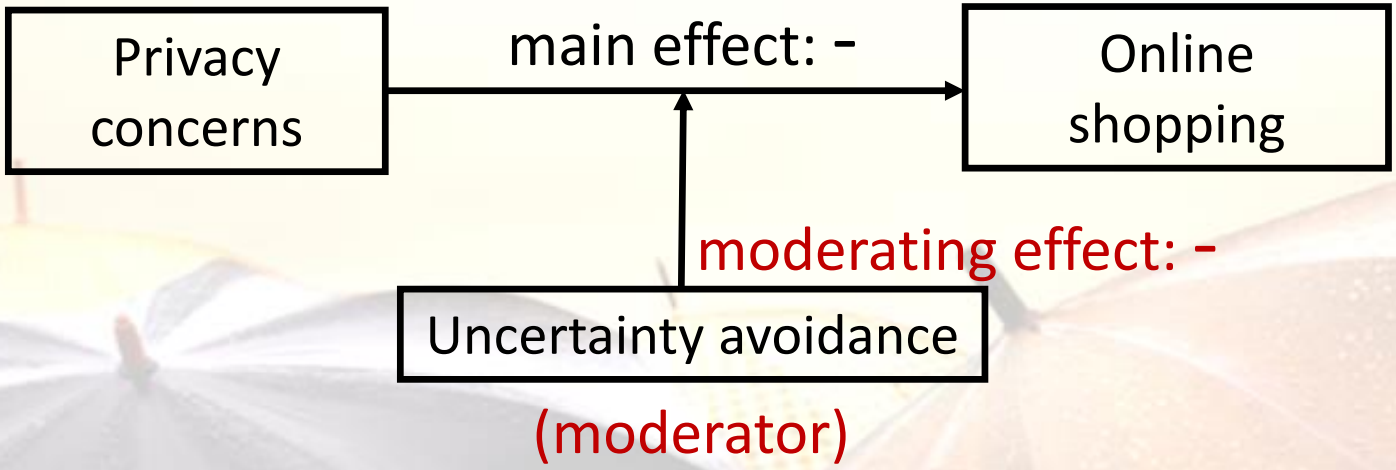
# Visualization of main effect




main effect: -

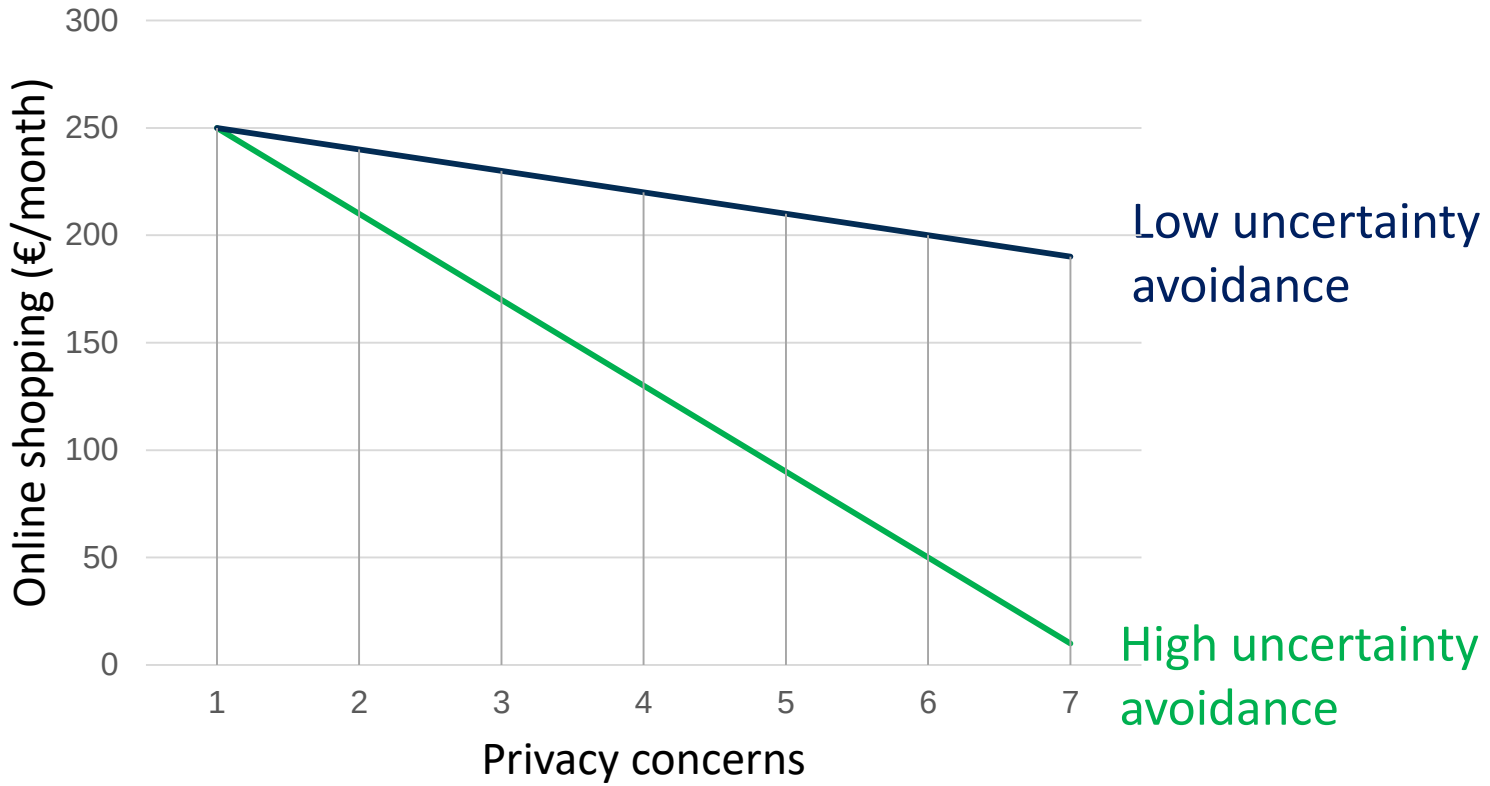
For every one point increase in privacy concerns, online shopping drops with €20 per month.

# Moderating effect




The effect of privacy concerns on online shopping is more negative when a consumer's uncertainty avoidance increases.

# Visualization of moderating effect

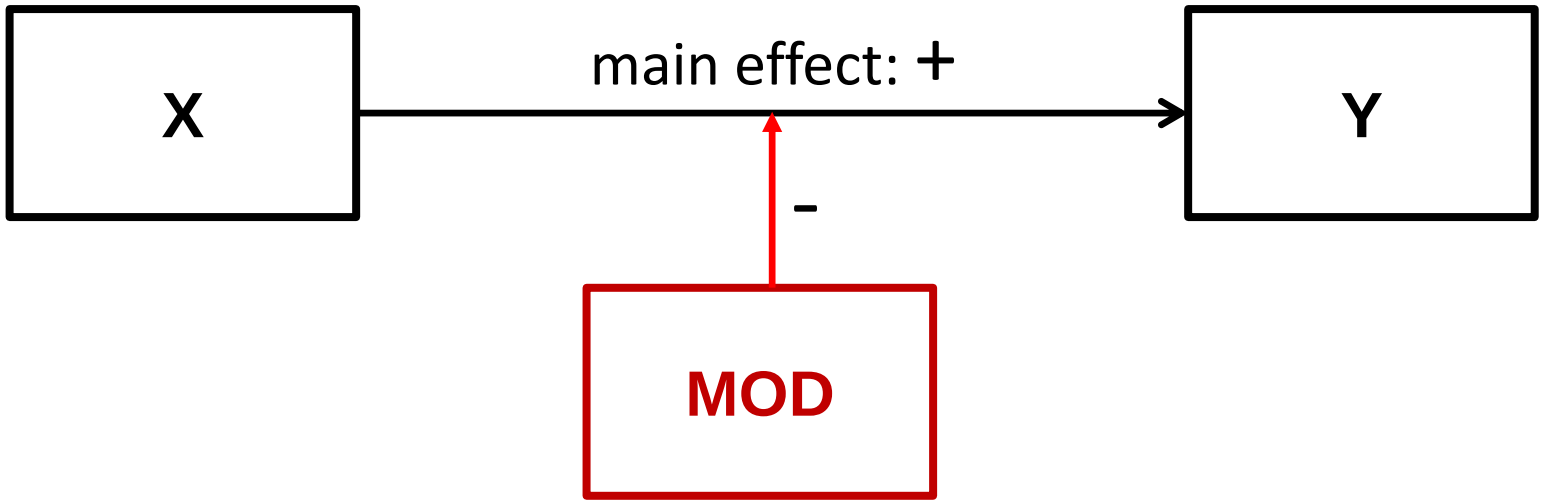



For every one point increase in privacy concerns,

- online shopping drops with €10/month for consumers low in uncertainty avoidance;
- online shopping drops with €40 month for consumers high in uncertainty avoidance.

# 3. A positive effect becoming less strong

# A positive effect becoming less strong

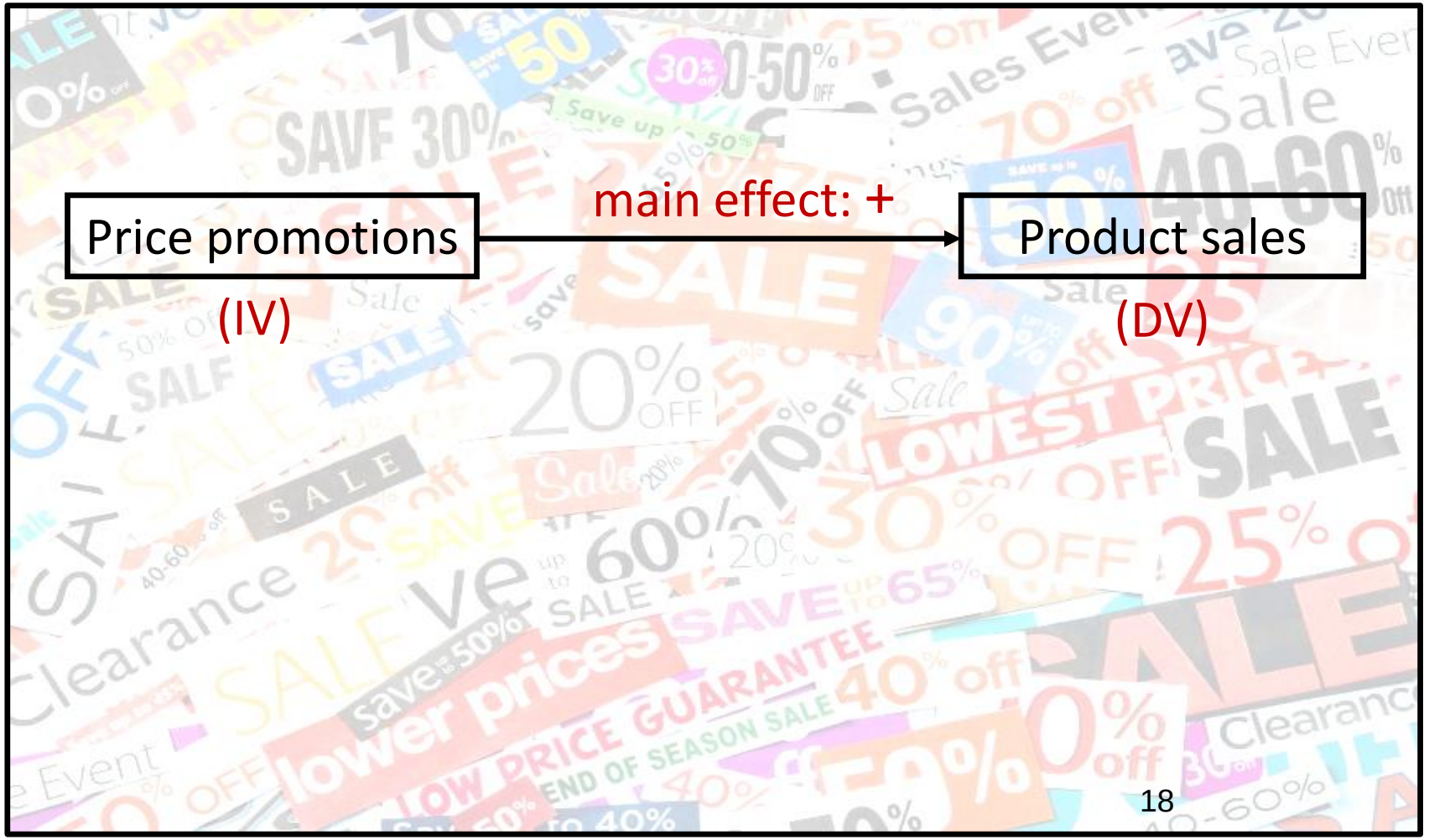



The effect of X on Y becomes less positive,

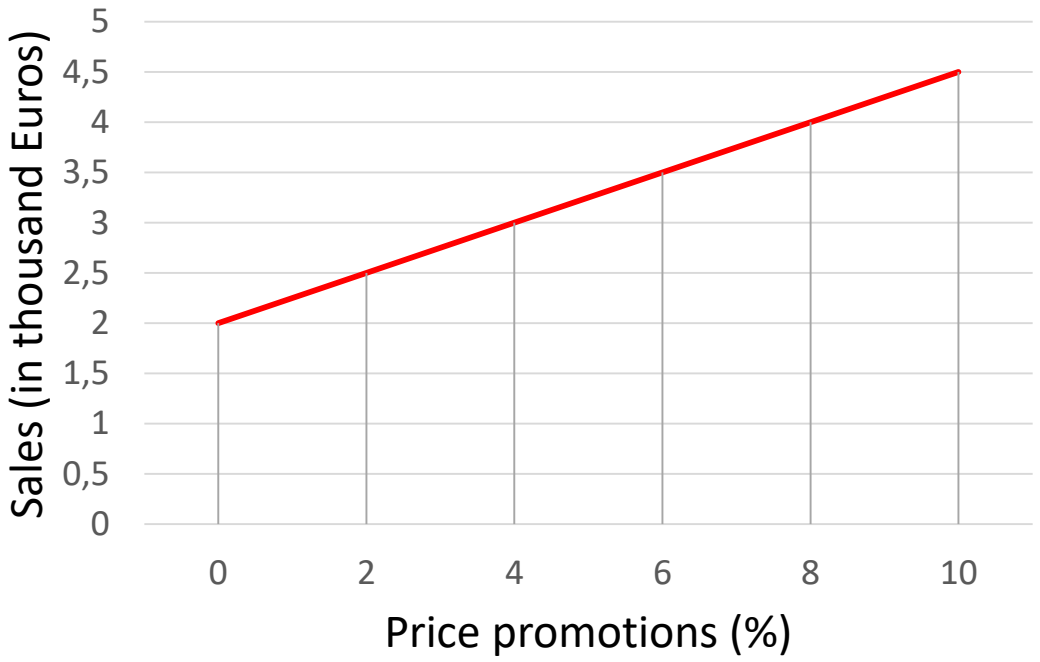
and may even become negative,

when MOD increases.

# Example



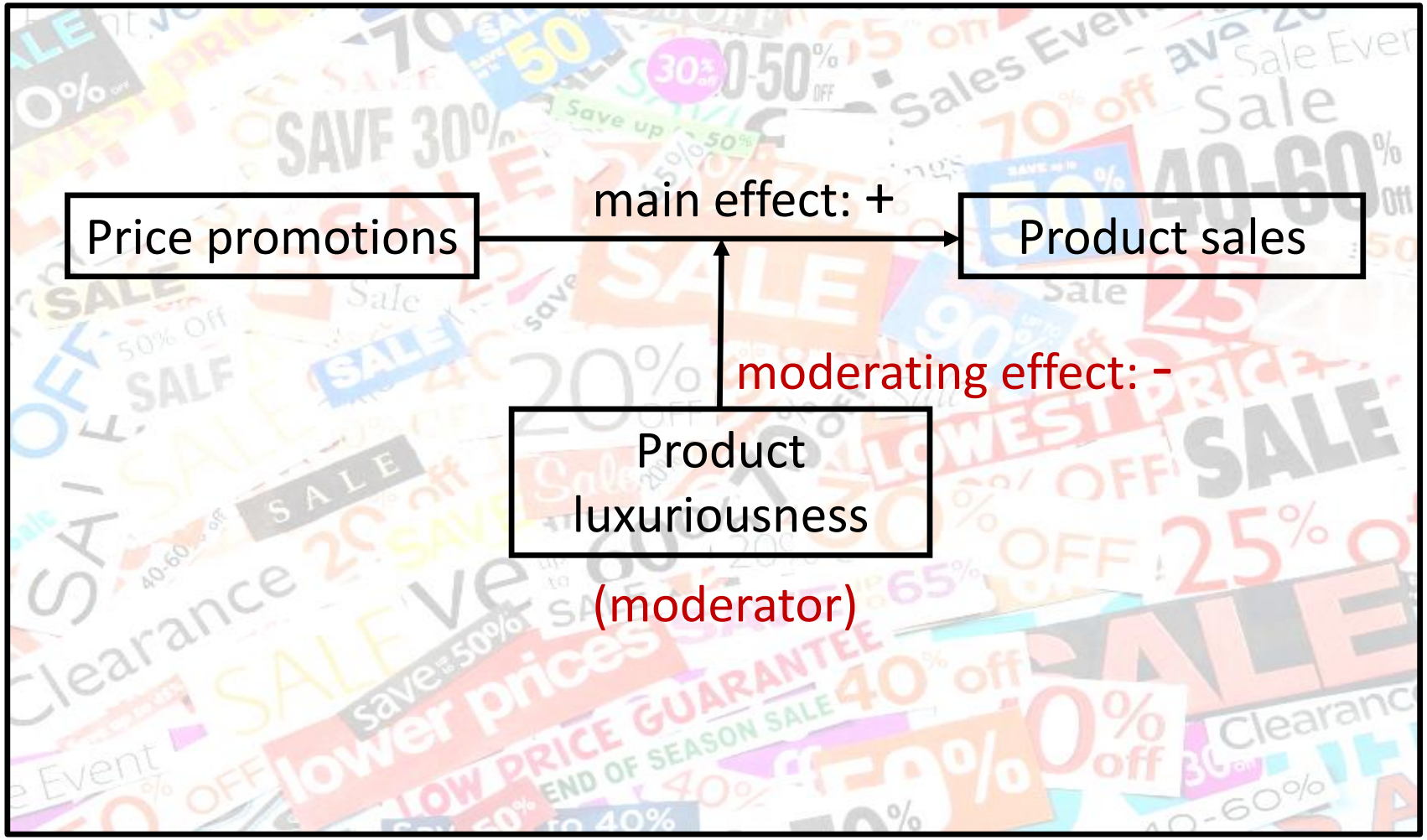
# Visualization of main effect



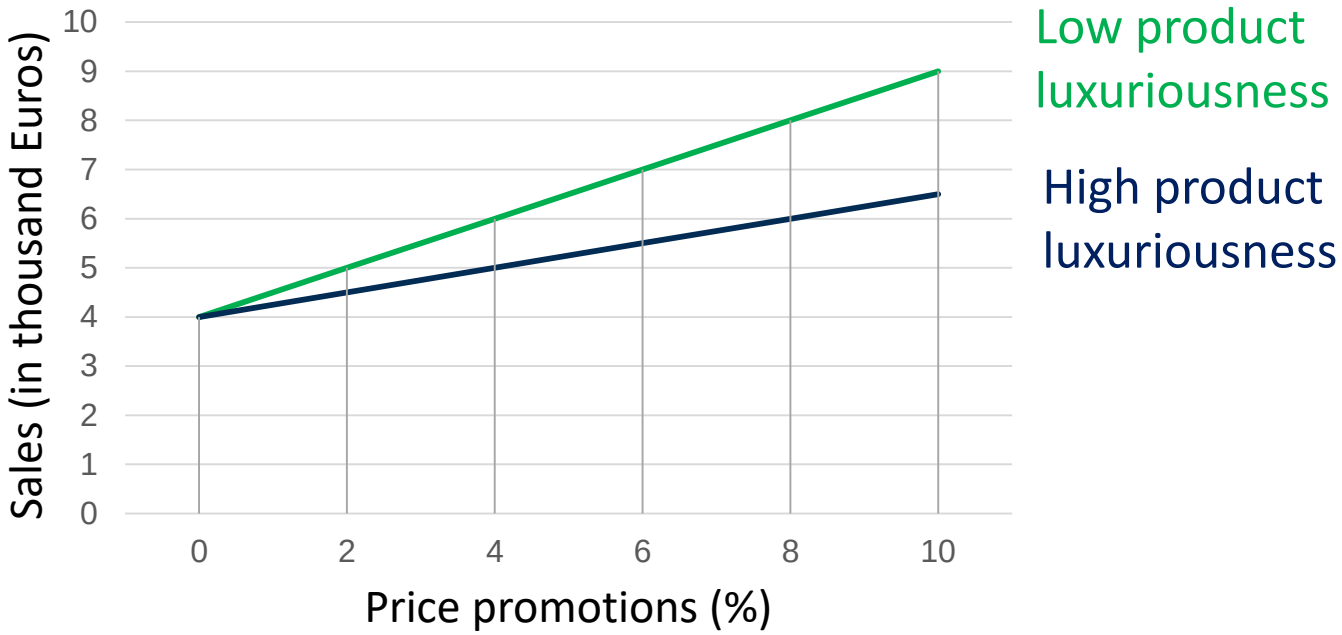

main effect: +

For every 2% increase in price promotions, product sales go up with 500 Euros

# Example


Price promotions
main effect: +
Product sales
moderating effect: -
Product luxuriousness
(moderator)

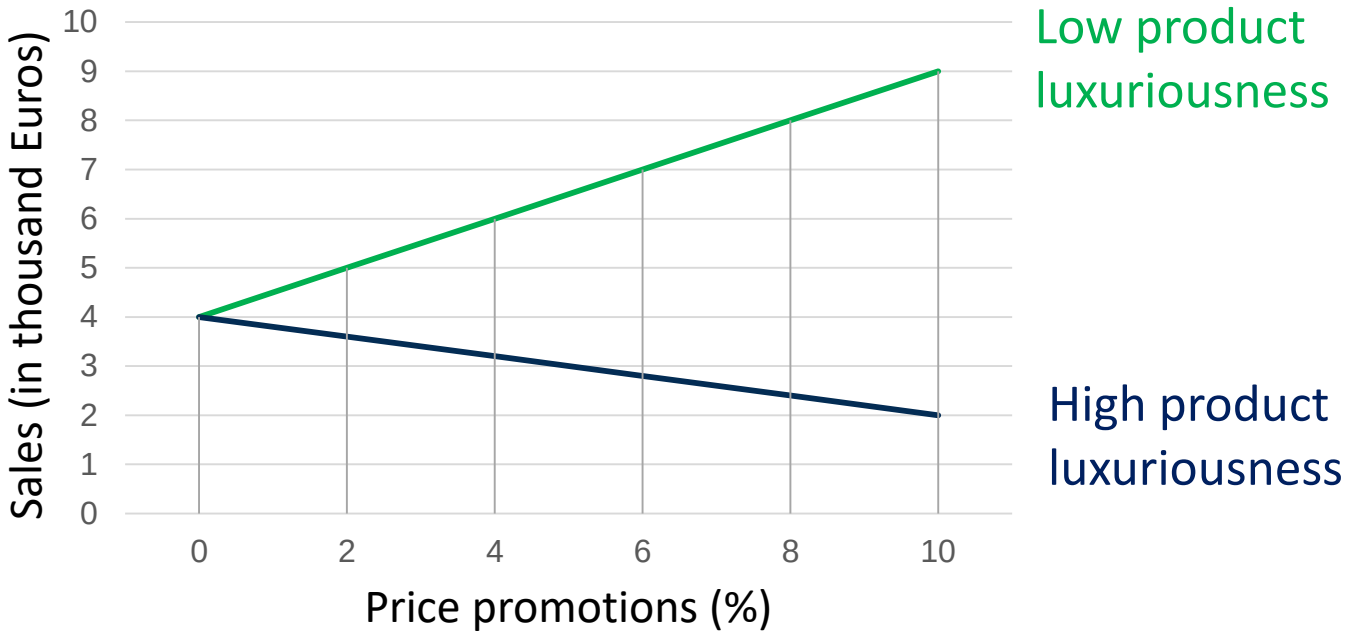
# Visualization of moderating effect (1)




For every 2% increase in price promotions,

- product sales increase with €1,000 per month for products low in luxuriousness;
- product sales increase with € 500 per month for products high luxuriousness.

# Visualization of moderating effect (2)

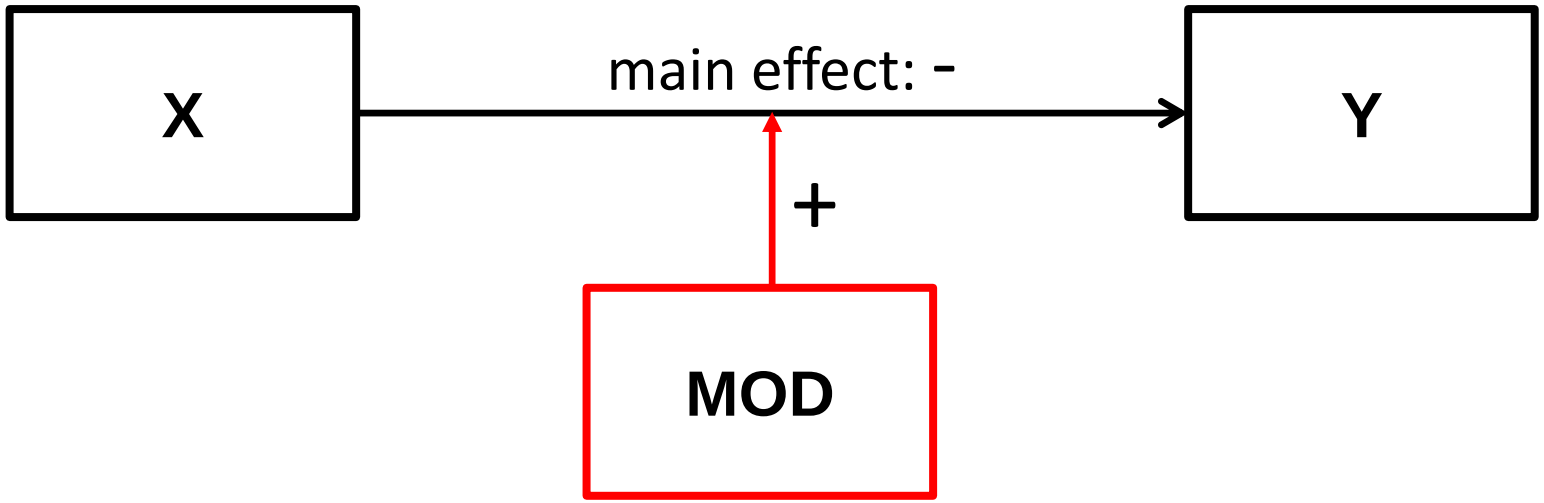



For every 2% increase in price promotions,

- product sales increase with €1,000 per month for products low in luxuriousness;
- product sales drop with € 500 per month for product high luxuriousness.

# 4. A negative effect becoming less strong

# A negative effect becoming less strong

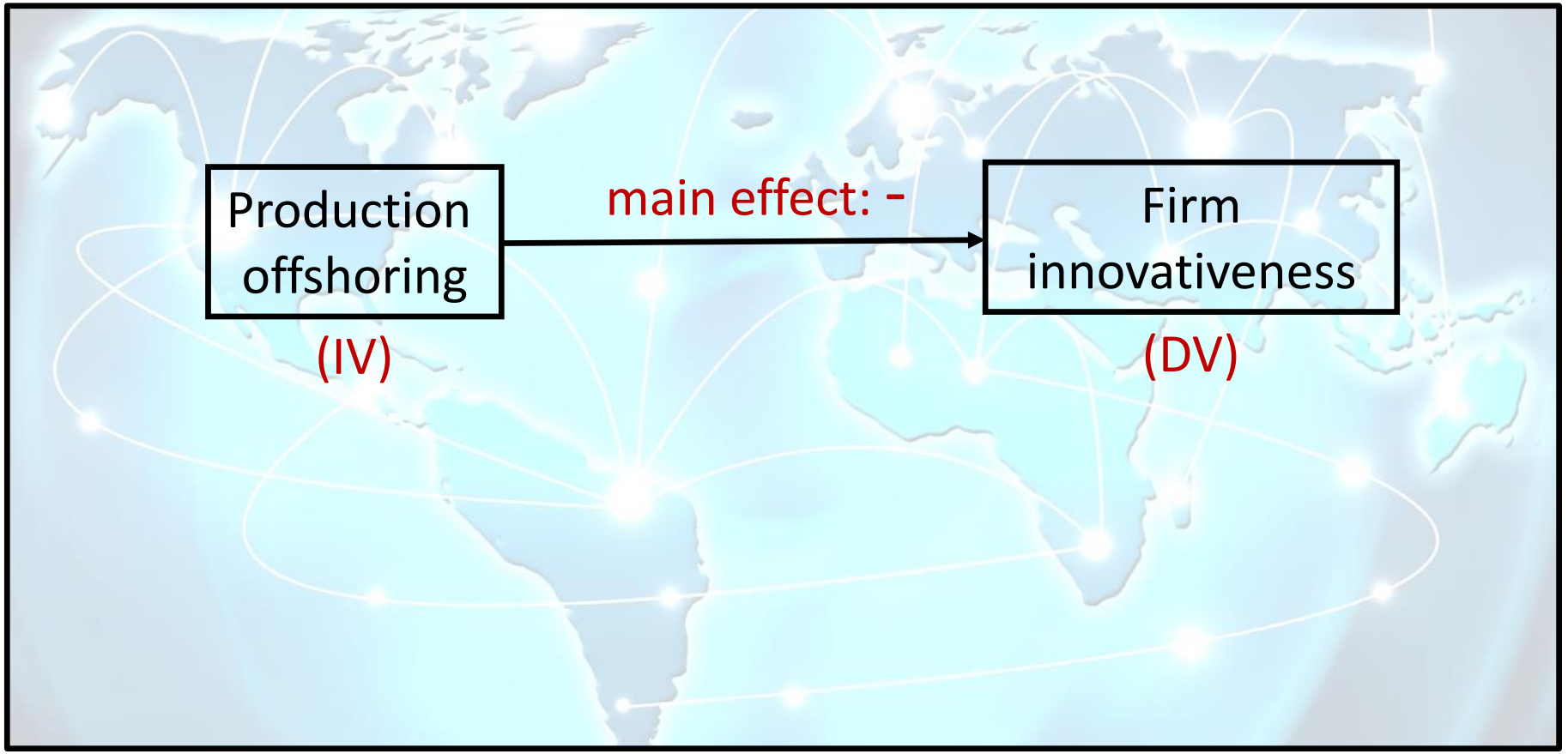



The effect of X on Y becomes less negative,

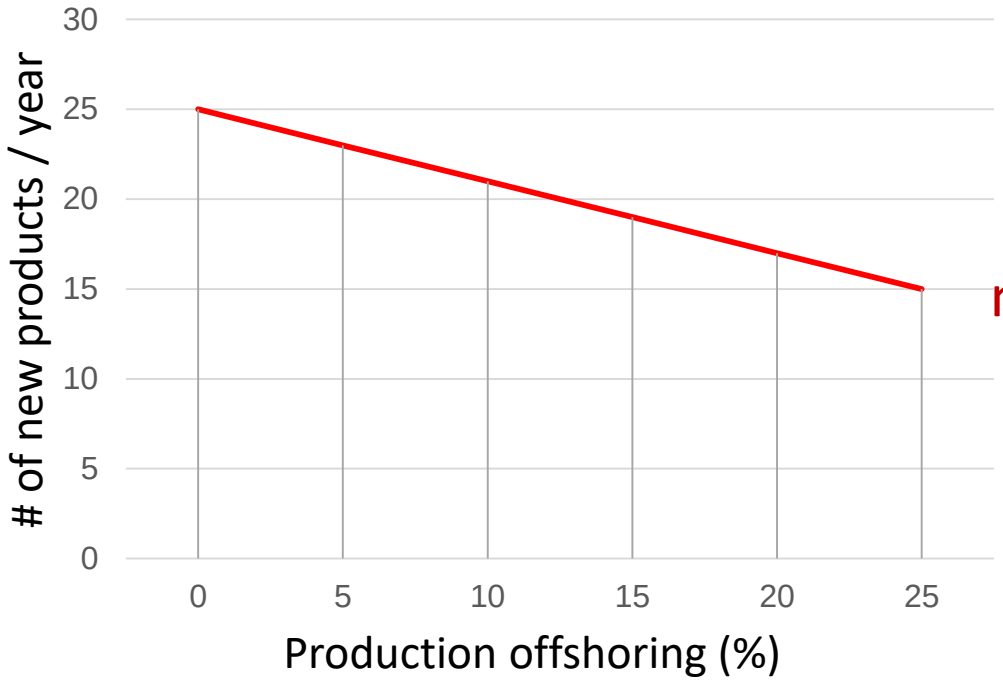
and may even become positive,

when MOD increases.

# Example


Production offshoring
(IV)
main effect: -
Firm innovativeness
(DV)

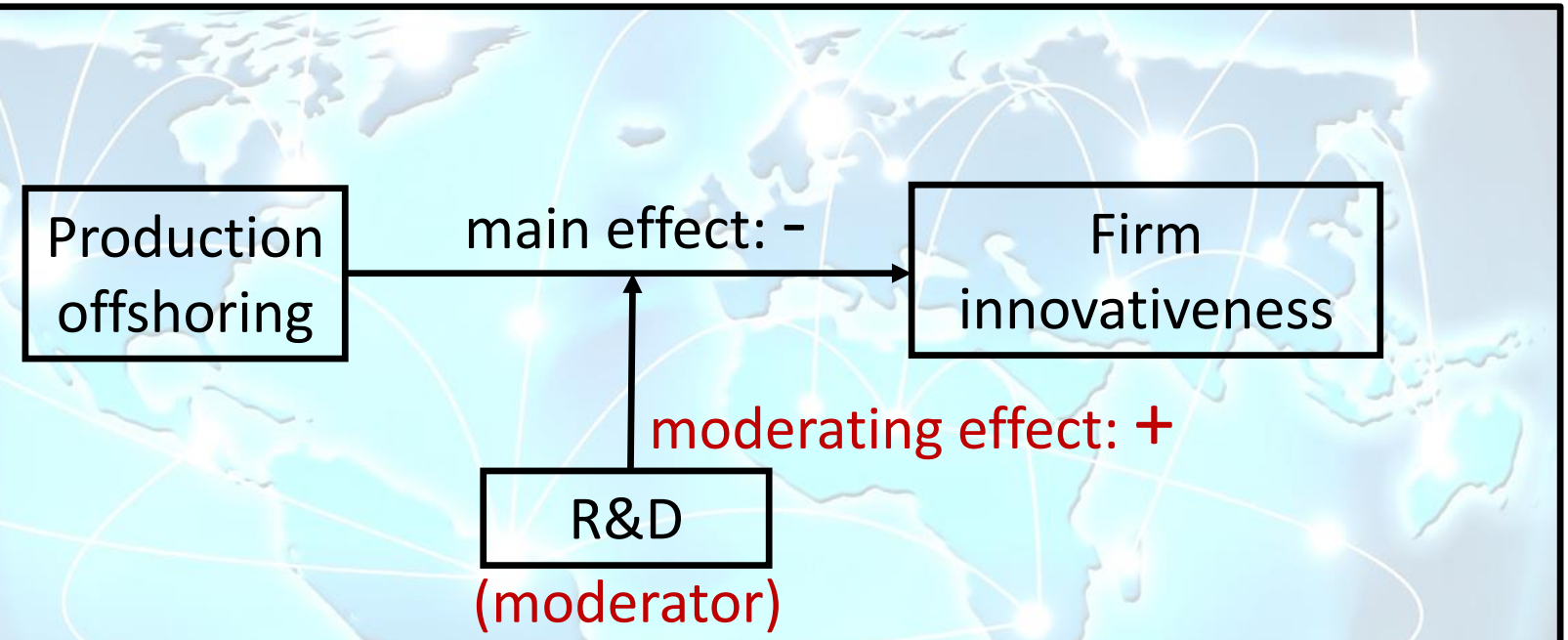
# Visualization of main effect




main effect: -

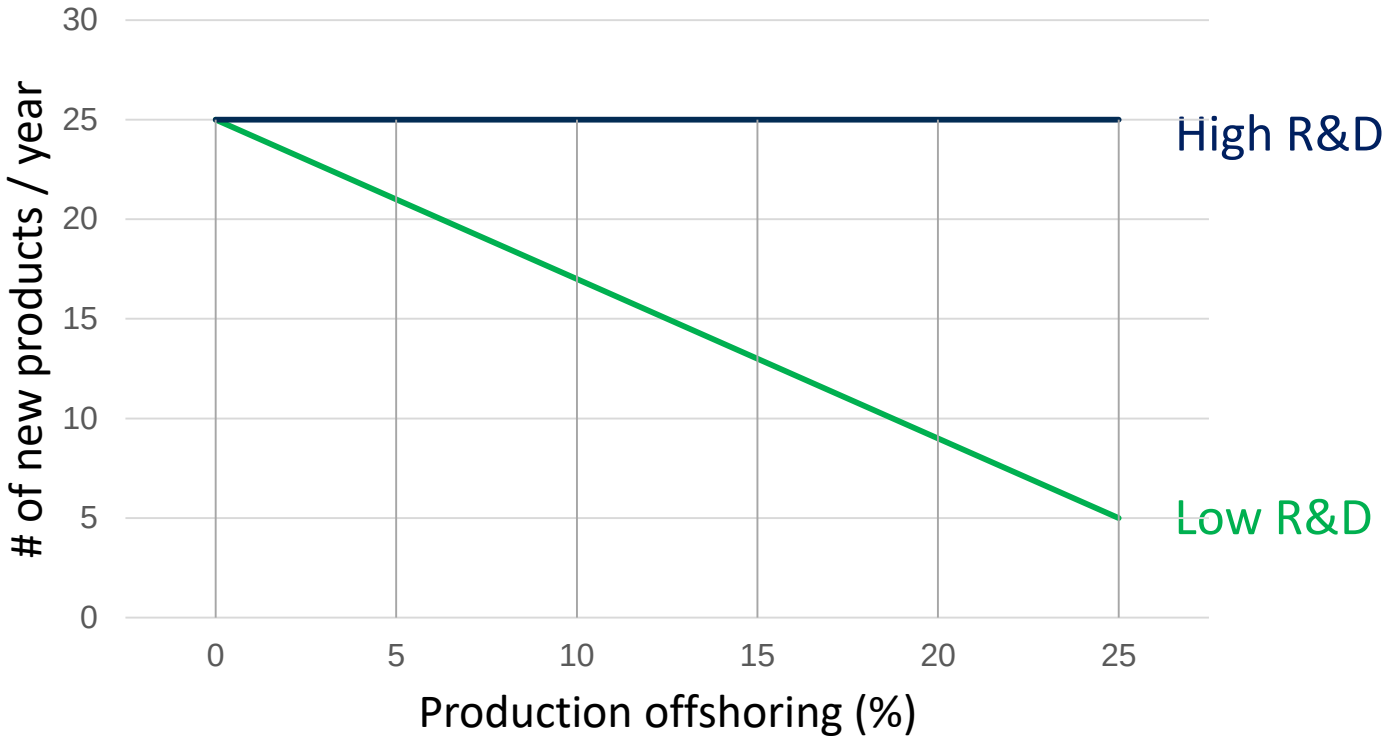
For every 5% increase in production offshoring, the number of new products drops with two.

# Moderating effect




The effect of production offshoring on firm innovativeness is less negative when R&D increases.

# Visualization of moderating effect

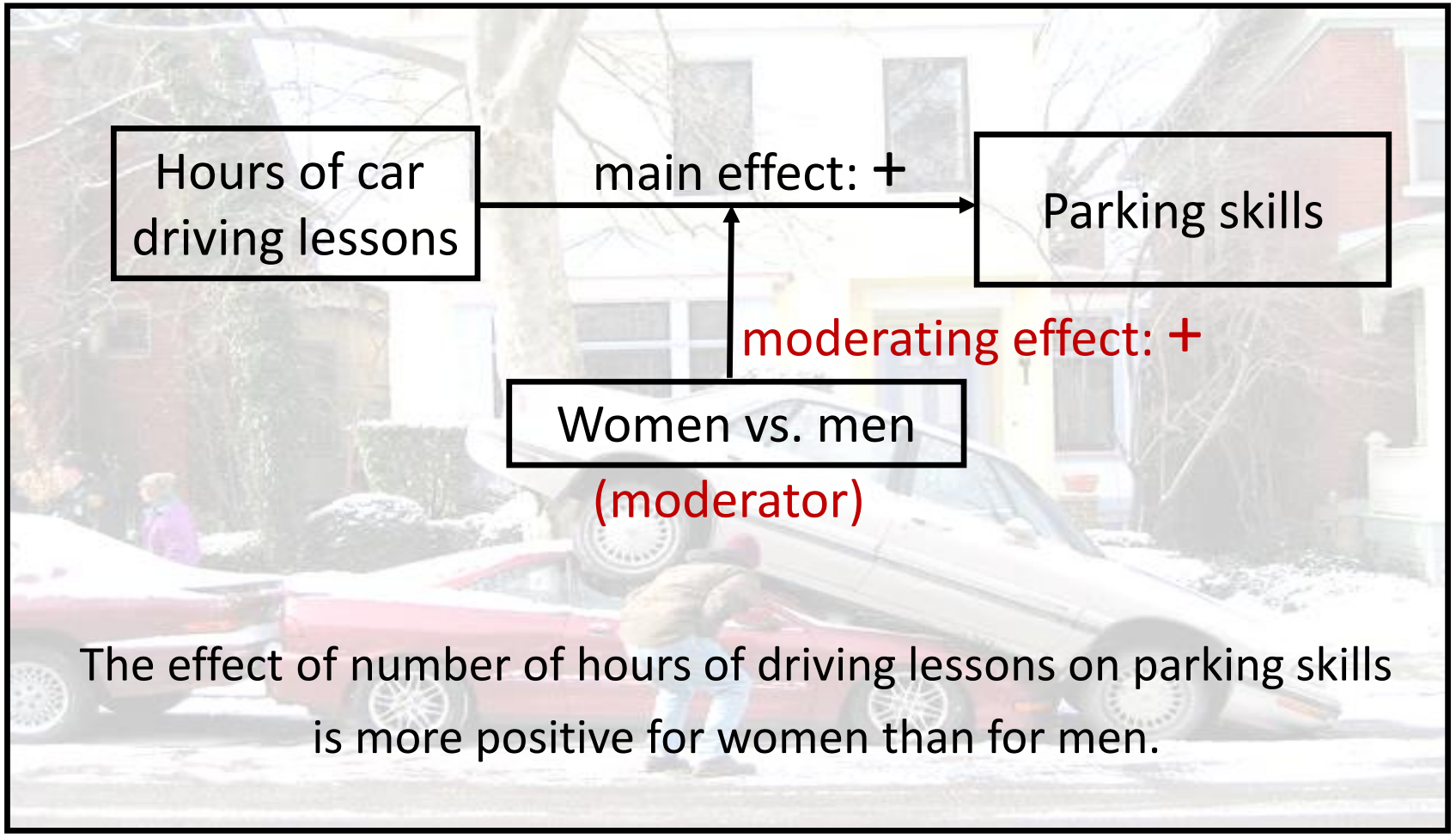



For every 5% increase in production offshoring,

- the number of new products does not drop if the firm is high on R&D;
- the number of new products drops with 4 if the firm is low on R&D.

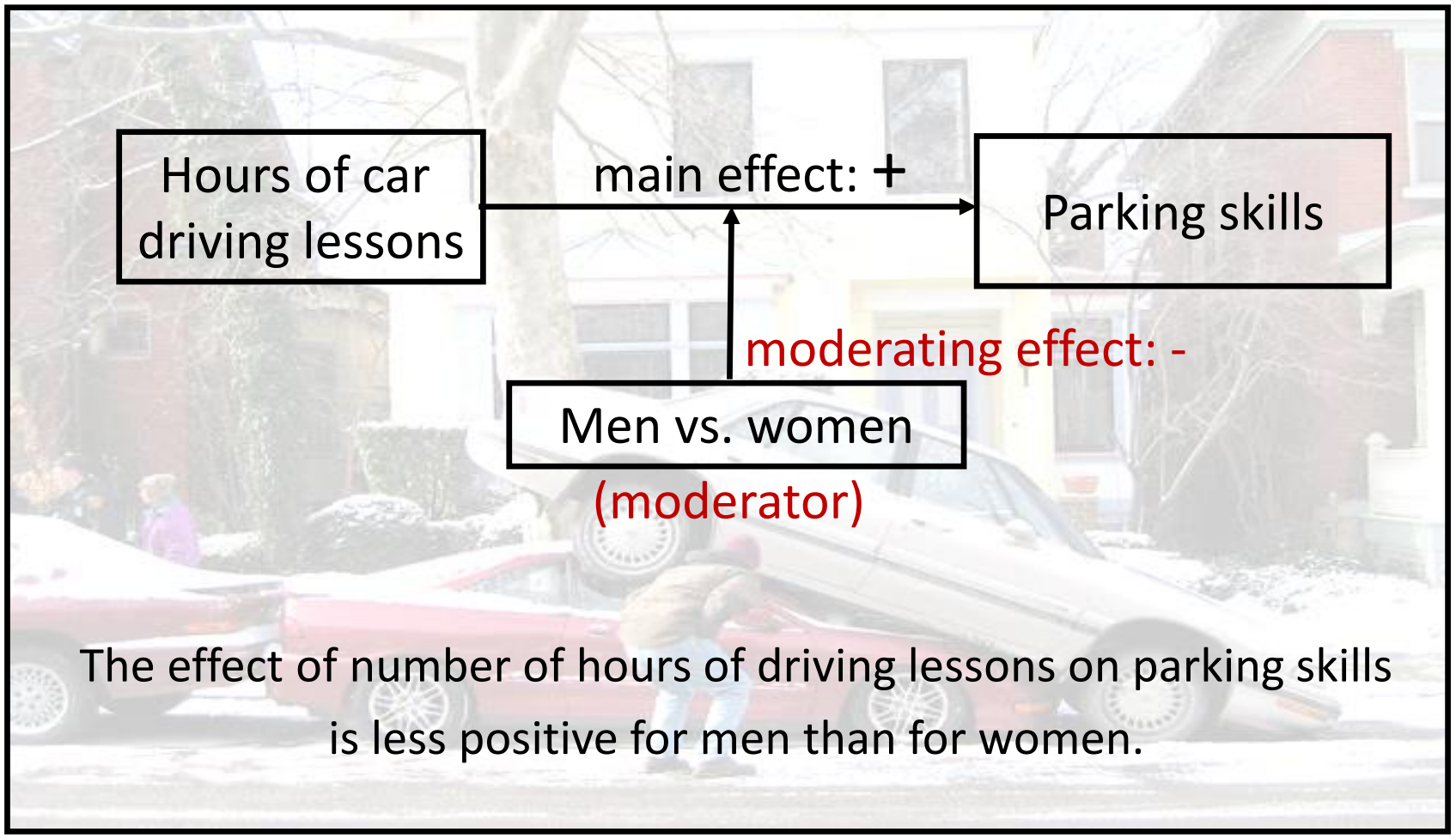
# 5. Extensions / special cases

# A discrete moderator



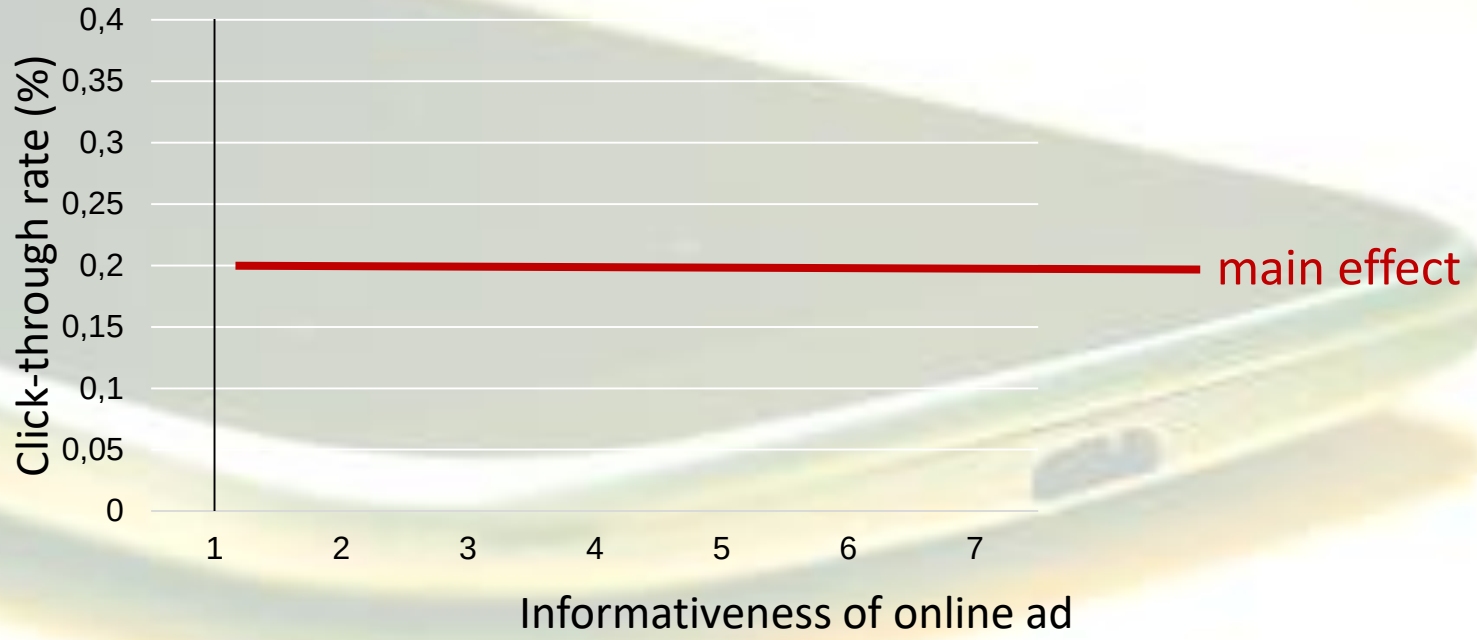

The effect of number of hours of driving lessons on parking skills is more positive for women than for men.

# A discrete moderator



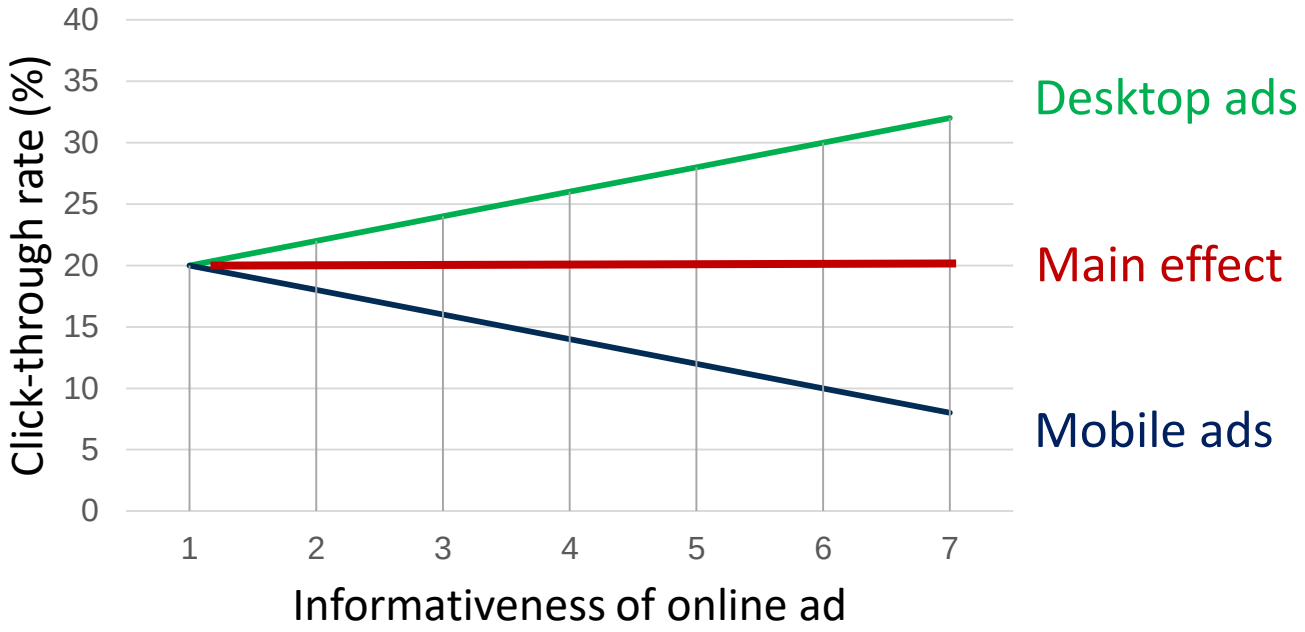

The effect of number of hours of driving lessons on parking skills is less positive for men than for women.

# Why a zero main effect can be interesting




There is no main effect of the informativeness of an online ad on its click-through rate.

# Why a zero main effect can be interesting

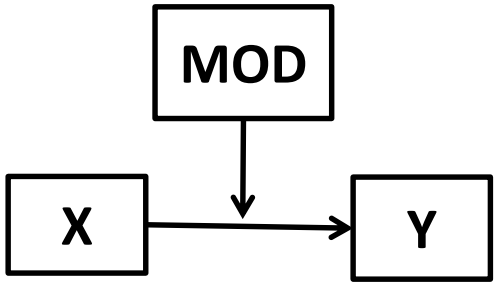



For every 1 point increase in the informativeness of an online ad,

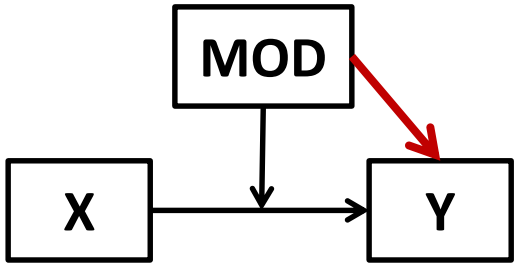
- the click-through rate increases with 2% for desktop ads;
- the click-through rate drops with 2% for mobile ads.

# Pure vs. quasi moderation

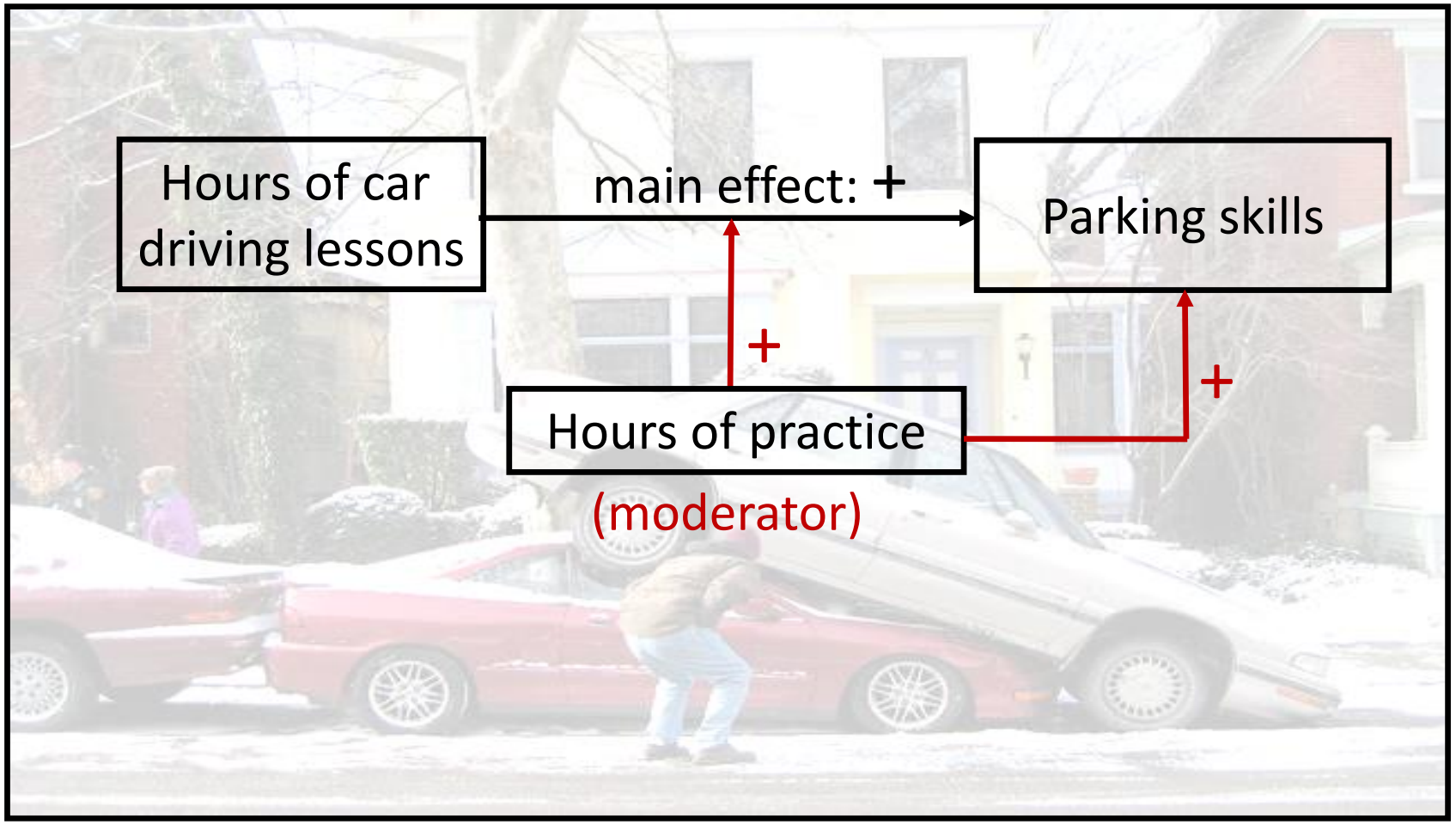
- Pure moderation: MOD moderates the relationship between X and Y, but it has no direct effect on Y



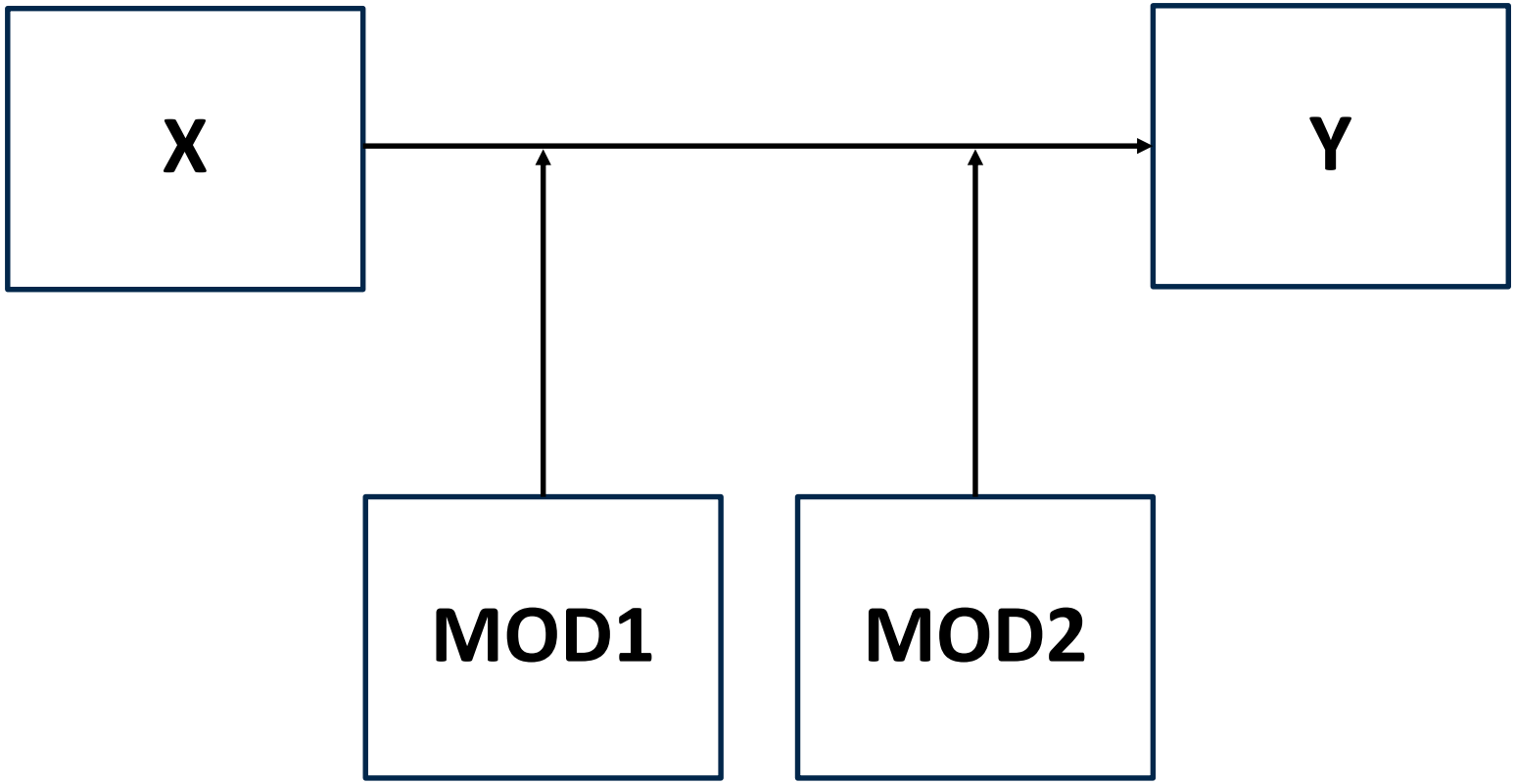

- Quasi moderation: MOD moderates the relationship between X and Y, and it also has a direct effect on Y



# Example of quasi moderation



# Multiple moderators



# Final notes

- When the moderating effect differs in sign from the main effect, the direction of the relationship MAY change.

- Moderating variables often make a research managerially relevant.